UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JUN 24 2011

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment (EA) for Framework Adjustment 22 to the Atlantic Sea Scallop Fishery Management Plan (Framework 22)

LOCATION: Atlantic Exclusive Economic Zone

SUMMARY: The purpose of Framework 22 is to set the following scallop management measures for the 2011 through 2013 fishing years: The overfishing limit, acceptable biological catches, annual catch limits, and annual catch targets for both the limited access and limited access general category (LAGC) fleets; open area days-at-sea (DAS) and Sea Scallop Access Area trip allocations; DAS adjustments if an access area yellowtail flounder total allowable catch (TAC) is caught; LAGC-specific allocations, including access area trip allocations for vessels with individual fishing quotas the Northern Gulf of Maine TAC, and the incidental target TAC; management measures to minimize impacts of incidental take of sea turtles as required by the March 14, 2008, Atlantic Sea Scallop Biological Opinion, and the elimination of the default Georges Bank access area rotation schedule.

RESPONSIBLE
OFFICIAL: Patricia A. Kurkul
Regional Administrator
National Marine Fisheries Service
National Oceanic and Atmospheric Administration (NOAA)
55 Great Republic Drive, Gloucester, MA 01930
(978) 281-9315

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement was not prepared. A copy of the Finding of No Significant Impact (FONSI), including the supporting environmental assessment, is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI, we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the Responsible Official named above.

Sincerely,

Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

Final
Framework 22 to the Atlantic Sea Scallop FMP

Including an Environmental Assessment, an Initial Regulatory Flexibility Analysis and Stock Assessment and Fishery Evaluation (SAFE) Report

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

Initial Council Meeting: June 22-24, 2010
Final Council Meeting: November 16-18, 2010
Submission to NMFS: January 14, 2011
Re-submission to NMFS: February 28, 2011, March 22, 2011

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EXECUTIVE SUMMARY

This framework and Environmental Assessment (EA) presents and evaluates management measures and alternatives to achieve specific goals and objectives for the Atlantic sea scallop fishery. This document was prepared by the New England Fishery Management Council and its Scallop Plan Development Team (PDT) in consultation with the National Marine Fisheries Service (NMFS, NOAA Fisheries) and the Mid-Atlantic Fishery Management Council (MAFMC). This framework was developed in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA, M-S Act) and the National Environmental Policy Act (NEPA), the former being the primary domestic legislation governing fisheries management in the U.S. Exclusive Economic Zone (EEZ). This document also addresses the requirements of other applicable laws (See Section 6.0).

In addition to the No Action alternative, the Council considered various other alternatives to address the purpose and need of this action. The purpose of this action is to achieve the objectives of the Atlantic Sea Scallop Fishery Management Plan (FMP), which is to prevent overfishing and improve yield-per-recruit from the fishery. The primary need for this action is to set specifications to adjust the day-at-sea (DAS) allocations and an area rotation schedule for the 2011 and 2012 fishing years. This framework adjustment also addresses other issues such as compliance with reasonable and prudent measures required in recent turtle biological opinion and minor adjustments to the FMP.

The term “proposed action” is used throughout this document to mean “preferred action”, in compliance with NEPA and its implementing regulations. The preferred or proposed action includes a specific Acceptable Biological Catch (ABC) level as required by the reauthorized Magnuson Act (2007). The ABC was calculated using the same method as in Framework 21, with updated data. The Science and Statistical Committee (SSC) gave recommendations for scallop acceptable biological catch of 31,279 mt in 2011 and 33,234 mt in 2012, which includes non-yield fishing mortality (discards and incidental mortality).

Fishery specifications for 2011, 2012 and 2013 are included in this action for both limited access and limited access general category vessels. Fishery allocations are based on an open area fishing mortality target of $F = 0.38$, which is consistent with updated reference points from the June 2010 Stock Assessment Workshop (SAW 50, NEFSC 2010) and the updated overfishing definition in Amendment 15. This action includes a new concept of “split fleet” trip allocation of access area trips for the limited access fleet, which involves distributing trips to half the fleet in one area, and the other half of the fleet in a different area using a lottery mechanism. Access areas available to the fishery in 2011 include: Closed Area I, Closed Area II, Hudson Canyon, and Delmarva. In 2012, the fleet can access the same four areas, plus Nantucket Lightship. This action considered closing a new access area in part of the Great South Channel for one year, but that alternative was not selected as part of the final action. Under the established target the open area DAS allocation in 2011 is approximately 11,300 DAS for the limited access fleet overall, equivalent to 32 DAS for full-time vessels, 13 DAS for part-time vessels and 3 DAS for occasional vessels. In 2012 full-time vessels will be allotted 34 open area DAS. Full rotational access schedule and default specifications for 2013 can be found in Table 8, listed as Alternative 1.

The total limited access general category (LAGC) allocation will be equivalent to 5.5% of the overall ACL for 2011, which is approximately 3.2 million pounds and 3.4 million pounds for 2012. Individual vessels will be allocated a set poundage they can harvest based on their individual contribution factor. LAGC vessels are also allocated 5.5% of the TAC in each access area, with the exception of Closed Area II which has a zero trip allocation because of the long distance from shore. LAGC vessels can choose to use these allocated trips, or they can harvest their quota from open areas. Once the fishery uses all trips in an access area the area is closed to general category fishing for the remainder of the year. How access areas are allocated to the LAGC fleet was set under Amendment 11; this action only specifies the TAC and number of trips available per area for that fleet (0% in CA2 and 5.5% in all areas). The hard-TAC for vessels that qualify for a limited access Northern Gulf of Maine general category permit will remain at 70,000 pounds for 2011, 2012 and 2013 unless changed by another action. Similarly, the target TAC for limited access incidental catch permits will remain at 50,000 pounds for these years.

A primary objective of this action is to include specific measures to comply with reasonable and prudent measures developed by NMFS in a recent biological opinion on this fishery regarding impacts on sea turtles. The proposed action includes a measure to limit the amount of access area trips that can be taken in the Mid-Atlantic during the period when turtles are most likely to be present. In 2011and 2012 this window is from June 15 to October 31. During these periods, only one Mid-Atlantic access area trip can be taken per limited access vessel. The Council also included a caveat that should a vessel trade up to four trips in the Mid-Atlantic, they can use two during the limited period instead of one.

In addition, this action includes research priorities for 2011 and 2012 along with the research and observer set-aside values that will be allocated. There is also an adjustment included if the 10% YTF bycatch TAC is reached and the Georges Bank access areas close. Under this alternative, additional open area DAS are allocated for each trip not taken before the area closes, but at a prorated value of DAS.

Lastly, this action includes a measure to eliminate the Georges Bank rotational area schedule in the regulations. Having a default schedule in the regulations has caused confusion and administrative burden especially when actions are implemented after the start of the fishing year.

A host of minor alternatives regarding VMS, possession limit of in-shell scallops seaward of the VMS demarcation line, extension of unused Elephant Trunk trips, gear modifications, observer payment problems, extension of the exemption for LAGC vessels in GSC, and procedures to reduce F in the Great South Channel if survey results suggest less trips should be taken in year two. All of these alternatives were either considered but rejected, or No Action was taken.

A complete list of the proposed action along with rationale can be found in Section 2.1.

Analyses of the selected alternatives, as well as all management alternatives considered during the development of this action are provided in this document across a series of valued ecosystem components, or VECs. VECs represent the resources, areas, and human communities that may be affected by a proposed management action or alternatives, and by other actions that have occurred or will occur outside the Proposed Action. An analysis of impacts is performed on each VEC to assess whether the direct/indirect effects of an alternative adds to or subtracts from the effects that are already affecting the VEC from past, present and future actions outside the Proposed Action (i.e., cumulative effects). The VECs identified for Framework 22: Atlantic sea scallop resource, physical environment and EFH, protected species, fishery-related businesses and communities, other fisheries, and non-target species.

The descriptive and analytic components of this document are constructed in a consistent manner. The Affected Environment section (Section 4.0) of this document traces the history of each VEC and consequently addresses the impacts of past actions. The Affected Environment section is designed to enhance the readers' understanding of the historical, current, and near-future conditions (baselines and trends) in order to fully understand the anticipated environmental impacts of the management alternatives under consideration in this amendment, which are described in Section 5.0. Overall, the cumulative effects of the proposed action on the scallop resource, EFH, protected resources, fishery businesses and communities, other fisheries and non-target species should yield non-significant neutral to low positive impacts.

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APPENDICIES

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LIST OF ACRONYMS

A10 – Amendment 10 to the Atlantic Sea Scallop Fishery Management Plan
A11 – Amendment 11 to the Atlantic Sea Scallop Fishery Management Plan
A13 – Amendment 13 to the Northeast Multispecies Fishery Management Plan
A15 – Amendment 15 to the Atlantic Sea Scallop Fishery Management Plan
AA – Access Area
ABC – Acceptable Biological Catch
ACL – Annual Catch Limit
ACT – Annual Catch Target
AM – Accountability Measure(s)
AP – Advisory Panel
B_{MSY} – Biomass at Maximum Sustainable Yield
BiOp, BO – Biological Opinion
CEQ – Council on Environmental Quality
CA – Closed Area
CAI – Closed Area I
CAII – Closed Area II
CASA – Catch-At-Age Size-At-Age (model)
CPH – Confirmation of Permit History
CV – Coefficient of variation, a standard statistical measure of variation, expressed as a percentage of the mean. Lower CVs indicate more accuracy in the estimates and less variation in data.
CWA – Cape Wind Associates
DAS – Day-at-sea
DMV – Delmarva
CPUE – Catch Per Unit Effort
DEIS – Draft Environmental Impact Statement

EA – Environmental Assessment
EEZ – Exclusive Economic Zone
ESA – Endangered Species Act
EFH – Essential Fish Habitat
    EFH designation life stages
        A – Adult life stage
        J – Juvenile life stage
        E – Egg life stage
ET, ETA – Elephant Trunk Area
FMP – Fishery Management Plan
FR – Federal Register
FEIS – Final Environmental Impact Statement
F_{MSY} – Fishing Mortality at Maximum Sustainable Yield
FW18 – Framework Adjustment 18 to the Atlantic Sea Scallop Fishery Management Plan
FW19 – Framework Adjustment 19 to the Atlantic Sea Scallop Fishery Management Plan
FW21 – Framework Adjustment 21 to the Atlantic Sea Scallop Fishery Management Plan
FW22 – Framework Adjustment 22 to the Atlantic Sea Scallop Fishery Management Plan
FY – Fishing Year
GB – Georges Bank
GC – General Category
GOM – Gulf of Maine
GSC – Great South Channel
G(R)T – Gross (Registered) Tonnage
HAPC – Habitat Area of Particular Concern
HC – Hudson Canyon
HP – Horsepower
LA – Limited Access
LAGC – Limited Access General Category
LPUE – Landings per unit effort, usually a DAS in this document
IFQ – Individual Fishing Quota
IRFA – Initial Regulatory Flexibility Analysis
IVR – Interactive Voice Reporting
LA – Limited Access
LAGC – Limited Access General Category
LIPA – Long Island Power Authority
LNG – Liquefied Natural Gas
LPUE – Landings Per Unit Effort
M – Natural Mortality
MA – Mid-Atlantic
MAFMC – Mid-Atlantic Fishery Management Council
MFMT – Maximum Fishing Mortality Target
MSST – Maximum Sustainable Stock Threshold
M-S Act – Magnuson Stevens Act
MSY – Maximum Sustainable Yield
NE – New England or Northeast
NEFMC – New England Fishery Management Council

NEFSC – Northeast Fisheries Science Center
NEPA – National Environmental Policy Act
NGOM – Northern Gulf of Maine
NL, NLAA – Nantucket Lightship Access Area
NMFS – National Marine Fisheries Service
NOAA – National Oceanographic Atmospheric Administration
OA – Open Area
OFD – Overfishing Definition
OFL – Overfishing Limit
OY – Optimum Yield
RIR – Regulatory Impact Review
RSA – Research Set-Aside
SAMS – Scallop Area Management Simulator (model)
SARC – Stock Assessment Review Committee
SASI – Swept Area Seabed Impact (model)
SAW – Stock assessment workshop
SBNMS – Stellwagen Bank Marine Sanctuary
SBRM – Standardized bycatch reporting methodology
SCH – Great South Channel
SCHCL – Proposed Great South Channel Closure
SDC – Status Determination Criteria
SH/MW – Shell Height-Meat Weight (relationship)
SMAST –School of Marine Science and Technology, University of Massachusetts Dartmouth
SNE – Southern New England
SNE/MA – Southern New England/Mid-Atlantic
SSC – Science and Statistical Committee
TAC – Total Allowable Catch. This includes discards for finfish species, but not for scallops which have a much lower discard mortality rate.
PDT – Scallop Plan Development Team
U10 – A classification for large scallops, less than 10 meats per pound.
USGS – United States Geological Survey
VEC – Valued Ecosystem Component
VIMS – Virginia Institute of Marine Science
VMS – Vessel Monitoring System
VTR – Vessel Trip Reports
WGOM – Western Gulf of Maine
WHOI – Woods Hole Oceanographic Institute
YTF/YT – Yellowtail flounder

1.0 BACKGROUND AND PURPOSE

1.1 BACKGROUND

In 2004, Amendment 10 introduced rotational area management and changed the way that the Scallop FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited access vessels to fish in any area, vessels are now authorized a specific number of trips to fish in controlled access areas defined by the plan or exchange them with another vessel to fish in a different controlled access area. Vessels can fish their open area DAS in any area that is not designated a controlled access area or closed area. Amendment 10 set up this program with a biennial framework process, which means an action is required every two years to allocate fishing effort in both open and access areas. This framework action will set specifications for fishing years 2011 and 2012, as well as set default measures for the start of 2013 in case the action that would set the 2013 and 2014 measures is delayed past the start of the 2013 fishing year. Annual specifications also include the specifications for the various limited access general category permits including the overall allocation for limited access general category vessels with IFQ permits, the total hard TAC for the Northern Gulf of Maine, as well as the target TAC for vessels with limited access general category incidental permits.

There are also several other issues that have been included for consideration in this framework that are not directly related to fishery specifications for FY2010. Foremost, in 2008 NMFS published a biological opinion, pursuant to section 7 of the Endangered Species Act (ESA) that considered the effects of the continued authorization of the Atlantic sea scallop fishery on ESA-listed species. That biological opinion included a specific Reasonable and Prudent Measure (RPM) and accompanying Term and Condition (T/C) to limit the amount of allocated scallop fishing effort by limited access scallop vessels that can be used in the area and during the time of year when sea turtle distribution overlaps with scallop fishing activity. This limit is required to be considered in every specification package in the scallop fishery unless the RPM is modified in a future biological opinion.

In addition this framework is considering minor adjustments to aspects of vessel monitoring systems (VMS) and potentially modifying the possession limit of in-shell scallops for general category vessels seaward of the VMS demarcation line.

In summary, this framework adjustment will address several primary management issues:

- Fishery specifications for FY2011 and FY2012 including setting of acceptable biological catch (ABC) as required by the reauthorized MSA and minimizing impacts of incidental take of sea turtles, as per the 2008 Biological Opinion to the Atlantic Sea Scallop FMP (first RPM and T/C). Default fishery specifications for the start of FY 2013, in case the subsequent framework action that would set the 2013 and 2014 measures is delayed past the start of the 2013 fishing year
- Area rotation adjustments (if necessary) including consideration of a new scallop access area on Georges Bank (only if high concentrations of biomass present in 2010 surveys and only if the area is either smaller and/or closed for a shorter period of time)

- Other measures including specific VMS restriction and potentially revisiting the possession limit of scallop seaward of the demarcation line.

1.2 PURPOSE AND NEED

The purpose of this action is to achieve the objectives of the Atlantic Sea Scallop Fishery Management Plan (FMP) to prevent overfishing and improve yield-per-recruit from the fishery. The primary need for this action is to set specifications to adjust the day-at-sea (DAS) allocations, general category fishery allocations and area rotation schedule for the 2011 and 2012 fishing years. In addition, the scallop fishery is subject to requirements of the 2008 Atlantic Sea Scallop FMP Biological Opinion, so this action will also include specific measures to minimize impacts of incidental take of sea turtles.

1.3 SCALLOP MANAGEMENT BACKGROUND

The Atlantic Sea Scallop FMP management unit consists of the sea scallop *Placopecten magellanicus* (Gmelin) resource throughout its range in waters under the jurisdiction of the United States. This includes all populations of sea scallops from the shoreline to the outer boundary of the Exclusive Economic Zone (EEZ). While fishing for sea scallops within state waters is not subject to regulation under the FMP except for vessels that hold a federal permit when fishing in state waters, the scallops in state waters are included in the overall management unit. The principal resource areas are the Northeast Peak of Georges Bank, westward to the Great South Channel, and southward along the continental shelf of the Mid-Atlantic.

The Council established the Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan, and some Amendments and Framework Adjustments in other plans have impacted the fishery. The following list summarizes the actions that have been taken since establishment of the FMP that signify changes to scallop management.

- Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access program to stop the influx of new vessels, a day-at-sea (DAS) reduction plan to reduce mortality and prevent recruitment overfishing, new gear regulations to improve size selection and reduce bycatch, a vessel monitoring system to track a vessel's fishing effort, an annual framework adjustment process to allow certain measures to be modified in response to changes in the fishery including scallop abundance, established a planned reduction in the annual day-at-sea allocations for vessels with limited access scallop permits, and created the general category scallop permit for vessels that did not qualify for a limited access permit. Limited access vessels were assigned different DAS limits according to which permit category they qualified for: full-time, part-time or occasional.
- Also in 1994, Amendment 5 to the Northeast Multispecies FMP closed Closed Area I, Closed Area II, and the Nantucket Lightship Area to scallop fishing, because of concerns over finfish bycatch and disruption of spawning aggregations (See Figure 1).
- In 1998, the Council developed Amendment 7 to the Scallop FMP, which was needed to change the overfishing definition, the day-at-sea schedule, and measures to meet new lower mortality targets to comply with new requirement under the Magnuson-Stevens Act. In addition, Amendment 7 established two new scallop closed areas (Hudson

Canyon and VA/NC Areas) in the Mid-Atlantic to protect concentrations of small scallops until they reached a larger size. Amendment 7 further reduced the DAS allocations under a 10-year 'rebuilding' period.

- Framework Adjustments 12, 14 and 15 to the Scallop FMP later adjusted the DAS allocations upward to meet the Amendment 7 fishing mortality targets.
- In 1999, Framework Adjustment 11 to the Scallop FMP allowed the first scallop fishing within portions of the Georges Bank groundfish closed areas since 1994 after resource surveys and experimental fishing activities had identified areas where scallop biomass was very high due to no fishing in the intervening years.
- In 2000, Framework Adjustment 13 to the Scallop FMP authorized full-time and part-time limited access vessels to take three trips in designated access areas within the three closed areas on Georges Bank.
- In 2001, Framework Adjustment 14 to the Scallop FMP implemented a new area access program to the Hudson Canyon and VA/NC Areas since scallop biomass had rapidly increased there. Framework Adjustment 14 allowed vessels with general category scallop permits to land 100 pounds of scallop meats from the Hudson Canyon and VA/NC Areas.
- Framework Adjustment 15 (2003) to the Scallop FMP continued the measures implemented in Framework Adjustment 14, but increased the Hudson Canyon and VA/NC Area scallop possession limit from 18,000 to 21,000 pounds per trip.
- In 2004, Amendment 10 to the Scallop FMP introduced rotational area management and changed the way that the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited vessels to fish in any area, vessels had to use a portion of their total DAS allocation in the controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. Vessels could fish their open area DAS in any area that was not designated a controlled access area. The amendment also adopted several alternatives to minimize impacts on EFH, including designating EFH closed areas, which included portions of the groundfish mortality closed areas. See Section 1.4 for a more detailed description of the rotational area management program implemented by Amendment 10.
- Framework 16 to the Scallop FMP, implemented in November 2004, adjusted DAS allocations and defined the area rotation schedule for part of the 2004 fishing year and the 2005 fishing year. It also included: a) an access program for vessels with general category scallop permits with enhanced reporting requirements and a 2% TAC set-aside; b) yellowtail flounder TACs and provisions to minimize bycatch; c) changes in finfish possession limits to minimize bycatch and bycatch mortality; d) seasons when scallop fishing would be allowed to minimize bycatch and bycatch mortality; e) enhanced sea sampling to improve precision of bycatch estimates; f) provisions to enhance enforcement monitoring and compliance; and g) a dredge-only restriction for fishing in the access areas to minimize bycatch and bycatch mortality.
- Framework 17 to the Scallop FMP was implemented in the fall of 2005. The purpose of the action was to provide more complete monitoring of the general category scallop fleet by requiring that vessels landing more than 40 pounds of scallop meats use monitoring systems (VMS). It also revised the broken trip adjustment provision for limited access scallop vessels fishing in the Sea Scallop Area Access Program.

- Framework 18 was implemented on June 15, 2006, which set management measures for fishing years 2006 and 2007. Limited access vessels were allocated a specific number of open area DAS for each fishing year, as well as a maximum number of trips for different access areas depending on their permit category. General category vessels were also permitted to fish in access areas with a 400 pound possession limit up to a total number of trips for that component of the fleet. An area called Delmarva was closed under this action to protect small scallops found in that area. Other measures were included in the action such as measures related to unused 2005 Hudson Canyon trips, transfer of access area trips to open areas if access areas close early if the YT bycatch TAC is attained, elimination of crew size restrictions in access areas, access area trips exchange program changes, broken trip program changes, and allocations for set-aside programs (1% for observer program and 2% for research).
- In June 2007 the Council approved Amendment 11 to the Scallop FMP and it was effective on June 1, 2008. The main objective of the action was to control capacity and mortality in the general category scallop fishery. Amendment 11 implemented a limited entry program for the general category fishery where each qualifying vessel received an individual allocation in pounds of scallop meat with a possession limit of 400 pounds. The fleet of qualifying vessels receives a total allocation of 5% of the total projected (LA and LAGC) scallop catch each fishing year. This action also established separate limited entry programs for general category fishing in the Northern Gulf of Maine, limited access scallop fleet fishing under general category rules, and an incidental catch permit category that permits vessels to land and sell up to 40 pounds of scallop meat per trip while fishing for other species.
- The Council approved Amendment 12 to the Scallop FMP in June 2007, with implementation at the start of the 2008 fishing year. This action is an omnibus amendment to all FMPs in the region and focuses on defining a standardized bycatch reporting methodology (SBRM). SBRM is the combination of sampling design, data collection procedures, and analyses used to estimate bycatch and to determine the most appropriate allocation of observers across the relevant fishery modes.
- Scallop Amendment 13 was also approved by both the Council and NMFS in 2007, which re-activated the industry-funded observer program. Since 1999, vessels required to carry an observer are authorized to land more than the possession limit from trips in access areas, and in open areas, vessels are charged a reduced amount to help compensate for the cost of an observer. Observers were deployed through a contractual arrangement between National Marine Fisheries Service (NMFS) and an observer provider until June 2004. Amendment 13 also includes a provision to make changes to the observer set-aside program by framework action and the Council decided to address some issues raised with the current program in this framework action.
- The Council initiated Phase 1 of the Essential Fish Habitat Omnibus Amendment in 2004. The primary purpose of Phase 1 is to review EFH designations, consider HAPC alternatives, describe prey species, and evaluate non-fishing impacts. This action is an amendment to all FMPs in this region, and is Amendment 14 to the Scallop FMP. The entire Amendment (Phase 1 and Phase 2) is still under development and implementation is not expected until 2011 at the earliest.
- The Council implemented Framework 20 to the Scallop FMP in December 2007. Framework 20 considered measures to reduce overfishing for FY2007 through measures

that were implemented by interim action earlier that year. The Council recommended that NMFS reduce the allocated number of trips for all scallop permit categories in the Elephant Trunk Access Area (ETA), delay the opening of the ETA, and prohibit vessels from possessing more than 50 bushels of in-shell scallops when leaving any controlled access area. The Council approved Framework 20 to extend the reduced fishing effort measures implemented by interim action through the end of the 2007 fishing year.

- Measures for fishing year 2008 and 2009 were approved in Framework 19. Framework 19 included the fishery specifications for these two fishing years including the access area schedule, DAS allocations and general category measures. The general category fishery was still under transition to an IFQ program at this time, so was allocated 10% of the total projected catch, managed under quarterly hard TACs. A new rotational area was closed to all scallop fishing (Hudson Canyon area) to protect small scallops. Other measures related to access area fishing were adopted including the continuation of eliminating the crew size restriction on access area trips and prohibiting all scallop vessels from "deckloading," and prohibition from leaving an access area with more than 50 bushels of in-shell scallop onboard.
- Specifications for FY2010 were implemented in June 2010 by Framework 21, several months after the start of the fishing year. The LAGC IFQ program was completely effective at that time so that segment of the fleet was allocated 5.5% of the projected TAC. Full-time vessels were allocated 38 open area DAS and 4 access area trips. This was the first action implemented after the 2008 biological opinion of the scallop fishery related to sea turtles which requires a limit on limited access scallop fishing in the Mid-Atlantic during the season turtles are present. The Council adopted an individual maximum number of access area trips during that season, as well as seasonal closures of Mid-Atlantic access areas during higher potential turtle interaction months, September and October. This action also made minor changes to the observer program and LAGC IFQ program.
- The Council is voted on Amendment 15 at the September 2010 meeting, and implementation is expected in mid-2011. This action will bring the Scallop FMP in compliance with new requirements of the re-authorized MSA (namely ACLs and AMs) and change several aspects of the overall program to make the scallop management plan more effective, including changes to the LAGC possession limit, RSA program, overfishing definition, closed area boundaries, and including a third year default specifications package in each framework adjustment.

1.4 DETAILED BACKGROUND ON ROTATIONAL AREA MANAGEMENT

Amendment 10 introduced area rotation: areas that contain beds of small scallops are closed before the scallops experience fishing mortality, then the areas re-open when scallops are larger, producing more yield-per-recruit. The details of which areas should close, for how long and at what level they should be fished were described and analyzed in Amendment 10. Except for the access areas within the groundfish closed areas on Georges Bank, all other scallop rotational areas should have flexible boundaries. Amendment 10 included a detailed set of criteria or guidelines that would be applied for closing and re-opening areas. Framework adjustments would then be used to actually implement the closures and allocate access in re-opened areas. The general management structure for area rotation management is described in 1.4. An area would close when the expected increase in exploitable biomass in the absence of fishing mortality exceeds 30% per year, and re-open to fishing when the annual increase in the absence of fishing mortality is less than 15% per year. Area rotation allows for differences in fishing mortality targets to catch scallops at higher than normal rates by using a time averaged fishing mortality so the average for an area since the beginning of the last closure is equal to the resource-wide fishing mortality target (80% of F_{max}, estimated to be F = 0.23).

Figure 1 and Figure 2 show the boundaries of the access areas on Georges Bank and in the Mid-Atlantic.

Table 1- General management structure for area rotation management as implemented by Amendment 10

Area type	Criteria for rotation area management consideration	General management rules	Who may fish
Closed rotation	Rate of biomass growth exceeds 30% per year if closed.	No scallop fishing allowed Scallop limited access and general category vessels may transit closed rotation areas provided fishing gear is properly stowed. Scallop bycatch must be returned intact to the water in the general location of capture.	Any vessel may fish with gear other than a scallop dredge or scallop trawl Zero scallop possession limit
Re-opened controlled access	A previously closed rotation area where the rate of biomass growth is less than 15% per year if closure continues. Status expires when time averaged mortality increases to average the resource-wide target, i.e. as defined by the Council by setting the annual mortality targets for a re-opened area.	Fishing mortality target set by framework adjustment subject to guidelines determined by time averaging since the beginning of the most recent closure. Maximum number of limited access trips will be determined from permit activity, scallop possession limits, and TACs associated with the time-average annual fishing mortality target. Transfers of scallops at sea would be prohibited	Limited access vessels may fish for scallops only on authorized trips. Vessels with general category permits will be allowed to target scallops or retain scallop incidental catch, with a 400 pounds scallop possession limit in accordance with general category rules.
Open	Scallop resource does not meet criteria to be classified as a closed rotation or re-opened controlled access area	Limited access vessels may target scallops on an open area day-at-sea General category vessels may target sea scallops with dredges or trawls under existing rules. Transfers of scallops at sea would be prohibited	All vessels may fish for scallops and other species under applicable rules.

Figure 1 - Boundaries of scallop access areas within Multispecies closed areas on Georges Bank

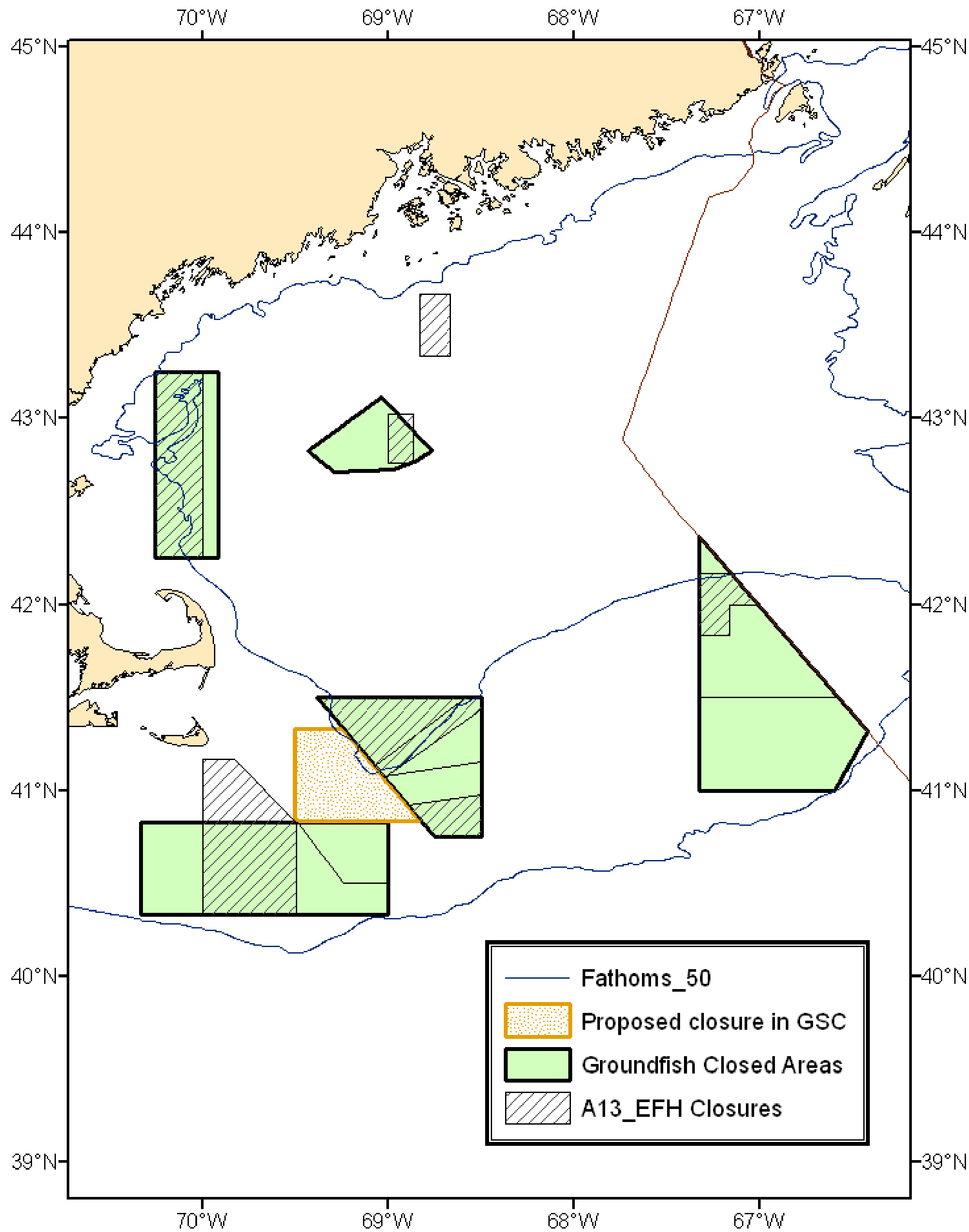
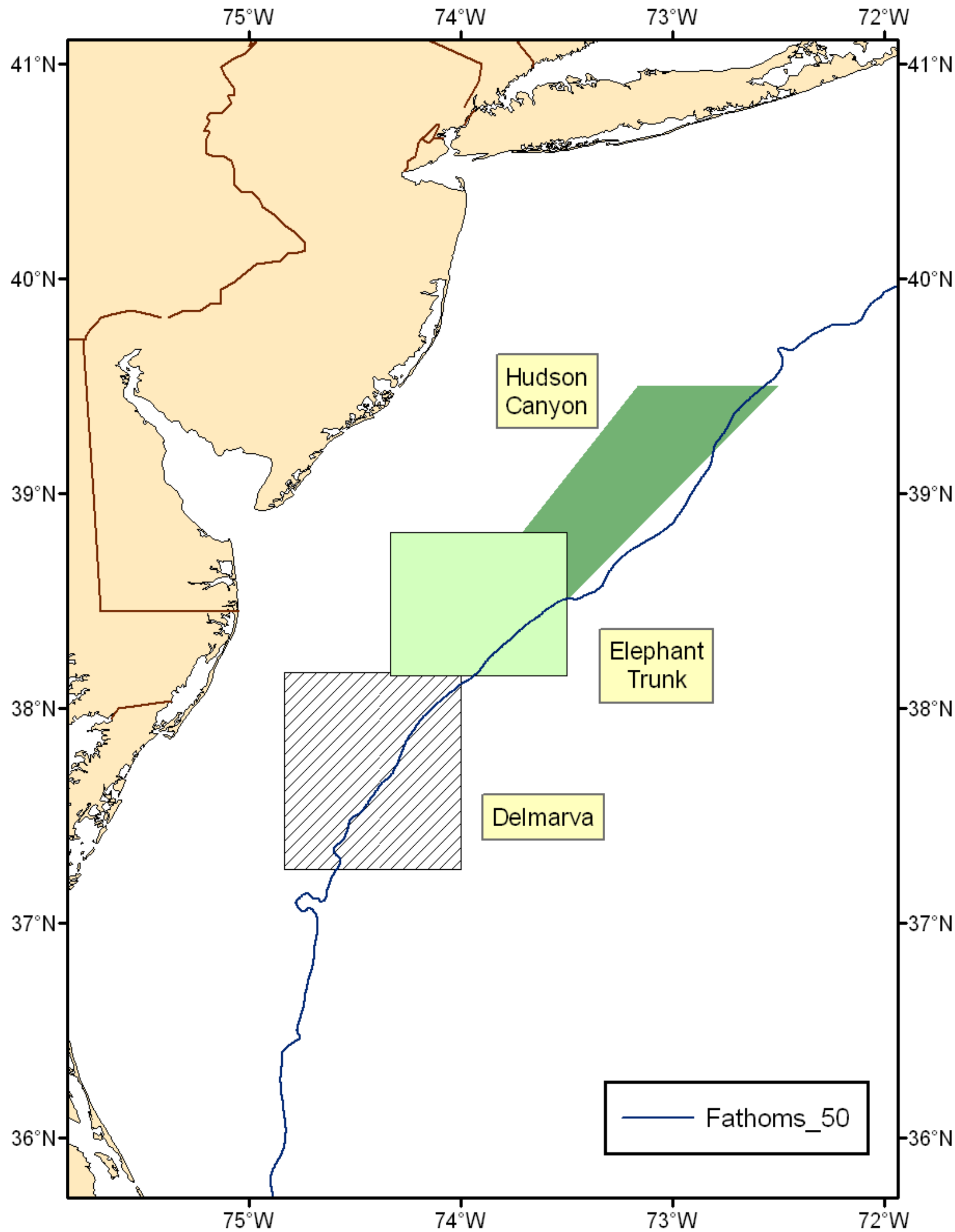


Figure 2 – Boundaries of scallop access areas in the Mid-Atlantic



2.0 MANAGEMENT ALTERNATIVES UNDER CONSIDERATION

2.1 SUMMARY OF THE PROPOSED ACTION

The term “proposed action” is used throughout this document to mean “preferred action”, in compliance with NEPA and its implementing regulations.

- **ABC (Section 2.3)**

The SSC gave recommendations for scallop acceptable biological catch of 31,279 mt in 2011 and 33,234 mt in 2012. These values were reviewed and approved by the Council at the September 2010 Council meeting. ABC has not been set for 2013; that will be done in the next scallop framework action when final specifications are set for that fishing year.

Rationale: The Scallop PDT presented these values to the SSC in August and the SSC agreed that setting acceptable biological catch at these amounts would provide maximum catch and be consistent with the biological objectives of the FMP. ABC has been identified taking biological uncertainty into considerations and is set at a fishing mortality rate that has a 25% probability of overfishing.

- **Allocation alternatives (Section 2.4 and 2.6)**

The Council selected Alternative 1 in Section 2.4 which allocates 32 open area DAS in 2011and has an access area schedule that allows trips to be split across the fleet. “Split fleet” trip allocation should occur randomly (not regionally-based; i.e. a lottery should be used) and transparently. These allocations are expected to generate about 52.3 million pounds in 2011 and 57.2 million pounds in 2012. Limited access general category vessels will be allocated 5.5% of the total fishery ACL each year, equivalent to 3.2 and 3.4 million pounds respectively. Set-asides for research and observer coverage will be removed before allocations to the limited access and general category fisheries, and associated allocations are summarized in Table 15. The full allocation schedule for full-time limited access vessels is shown in the table below. As described in Section 2.5, if the YT bycatch TAC in GB access areas is exceeded and the areas closes, limited access vessels will be allocated open area DAS as compensation at a rate varying by area between 4.3 and 5.7 DAS for 2011 and 4.3 and 5.4 DAS for 2012 (Table 16).

	CA1	CA2	NL	HC	DMV	ET	Total	Channel	OA DAS
2011	1.5	0.5	-	1	1	-	4	Open	32
2012	0.5	1	0.5	1.5	0.5	-	4	Open	34
2013*	-	1	1	1.5	0.5	-	4	Open	26

**Default measures for 2013; subsequent action will replace these measures when updated catch and resource information are available.*

Finally, under the proposed allocation alternative the total limited access general category (LAGC) allocation will be equivalent to 5.5% of the overall ACL for 2011, which is approximately 3.2 million pounds and 3.4 million pounds for 2012. Individual vessels will be allocated a set poundage they can harvest based on their individual contribution factor. LAGC vessels are also allocated 5.5% of the TAC in each access area, with the exception of Closed Area II which has a zero trip allocation because of the long distance from shore. LAGC vessels can choose to use these allocated trips, or they can harvest their quota from open areas. Once the fishery uses all trips in an access area the area is closed to general category fishing for the remainder of the year (Section 2.6).

Overall, if specifications are modified by this action the allocations for limited access vessels (DAS and access area trips), general category vessels (IFQ and fleetwide maximum of trips in access areas), DAS compensation for LA vessels if the YT TAC in GB access areas is reached, and the set-aside amounts for observer and research programs will be updated. All of these allocations are part of the specification process already and this action only includes the specific values. The programs themselves are already part of the regulations, only the values need to be updated based on the new overall TAC and updated estimates of LPUE for calculating the open area DAS compensation if the YT TAC is reached in a GB access area. Therefore, the impacts of these programs and allocations have primarily been analyzed in previous actions.

Rationale: There was PDT, AP and Committee support for this alternative. Once the Council was informed by the Regional Office staff that allocating “split trips” across the fleet was reasonable and administratively feasible, the Council fully supported this option that optimizes yield by allocating the maximum amount of effort by area, since it is not constrained by allocating whole integer trips in access areas. There is still little support for any closure of the Great South Channel (Alternative 3), mostly due to fears of effort shifts it would cause and distributional impacts it would create. Option 1 creates higher landings, revenues, and total economic benefits for the nation compared to the No Action alternative and Alternative 2.

- **NGOM TAC (Section 2.6.3)**

The Council chose to keep the NGOM TAC at status quo of 70,000 lbs.

Rationale: Based on the results of the 2009 NGOM resource survey in federal waters, the PDT recommended lowering the NGOM TAC, also noting that something higher to account for state catch could be warranted. The AP, Committee and Council considered this information and ultimately decided to keep the catch at 70,000 pounds in order to account for concerns over potential increases in landings applied to the NGOM TAC that may occur in the future by federally-permitted NGOM vessels fishing in Maine’s state waters. Since catch between state and federal waters cannot be distinguished with certainty, any catch in this fishery comes off the federal TAC, even if it is caught in state waters. So if the federal TAC is set too low, it could prevent vessels with a federal permit from participating in the state water fishery, which is expected to be improved based on very restrictive state water measures put in place in the last few years.

In Amendment 11, the Council recognized that the NGOM management area would encompasses both landings from state and federal waters, and that although the NGOM TAC would only apply to the resource in the federal portion of the NGOM, management in the EEZ component of the fishery should be as compatible with state management regulations as possible.

The proposed 70,000-lb TAC for the NGOM fits within the recent survey's estimated TAC range when using the bounds of an 80% confidence interval, while still taking into account concerns over NGOM landings applying to the state TAC. Future adjustments to the NGOM management area may be considered in a future amendment or framework.

- **Incidental Catch (Section 2.6.4)**

The proposed action recommends keeping the status quo value for incidental catch of 50,000 pounds.

Rationale: Data from 2007 to 2010 shows that landings in the incidental catch category have never exceeded 20,000 pounds (Table 22). While there is some agreement that there is justification for lowering the 50,000 limit, the Council feels that it will be more precautionary to have a few more years' worth of data before making this change since there could be reporting issues.

- **TAC set asides for observers and research and setting research priorities (Section 2.7.2.2.1)**

The TAC set-asides for observers and research are described in Table 24. As proposed under Amendment 15, the observer set-aside is equivalent to 1% of the ACL and the research set-aside is equivalent to 1.25 million pounds. The proposed action also includes detailed research priorities for 2012 and 2013, which include changes suggested by the PDT, AP, and Committee. The items listed with high, medium, and other priority are described in detail in Section 2.7.2.2.2.

Rationale: A variety of changes were made to the research priorities for 2012-2013 based on updated management needs. The Elephant Trunk area was removed from the list of areas that should be surveyed using industry-based means due to the fact that this area is no longer viable as an access area. Furthermore, reference to the Great South Channel was removed since that area was not identified as a scallop access area closure in this action. Seasonality of bycatch catch was added to the priority to identify and evaluate ways to reduce bycatch because there have been many anecdotal suggestions that targeting scallops at certain times of the year can reduce bycatch and the Council feels this is worth looking into. Some changes were made to the priority that identifies needs for sea turtle research. Research that will benefit an assessment of loggerhead turtles was added to the highest priority bullet. A more accurate assessment of the loggerhead population would lead to more effective management of the scallop fishery in relation to its interaction with this species. Evaluation and analysis of factors affecting bycatch rates of sea turtles was removed from priorities, along with comparison and analysis of turtle capture rates of similar gear in other fisheries. These priorities have been important in the past but have either been addressed or updated/replaced by other language. Quantifying the extent that chain mats reduce mortalities was changed to "gear modifications" because other means of reducing impacts on turtles with gear modifications have been developed, but at the time of the original priority setting chain mats were the standard method.

Under the "medium priorities," the Council made changes to the bullet that addresses other surveys to compliment the NMFS survey. There is concern that the NMFS dredge survey does not span the entire fishable resource range, which leads to lower estimates of harvestable biomass. This is of particular concern in open areas, where dredge efficiency estimates must also be updated.

Three bullets were added to the "other priorities" list, and one was removed. Calibration of the federal dredge survey during its transitional phase has been completed, so this bullet was removed. Bullets addressing habitat research areas, the development of "study fleets," and environmental impact studies were added because the Council feels these area areas that may be important to address with research to meet future management needs.

- **Reasonable and prudent measure (RPM) to reduce the interaction of scallop gear with sea turtles (Section 2.9)**

The proposed action supports an RPM of one access area trip maximum in the Mid-Atlantic (measure C) with no seasonal closures of Mid-Atlantic access areas. In addition, a caveat should be included that if someone trades in two additional Mid-Atlantic access area trips (to have four total), that vessel would be limited to taking two during the turtle window instead of one.

Rationale: There was very little support for seasonal closures to address turtle interactions due to the uncertain and unpredictable nature of regional impacts they cause, in addition to impacts on the seasonal landings stream and the safety of the fishery by pushing effort outside of the summer (best weather) months. Since the proposed trip maximum alternative limits the amount of effort each vessel can use in the Mid-Atlantic during the entire turtle season, it is more direct than measures that only limit effort for part of the turtle season. For example, if a seasonal closure is for two months only, all the effort reduced during those two months could be re-directed into months still within the 4.5 month turtle season, have similar or even greater impacts on turtles, depending on when the effort shifts. This alternative is expected to shift a considerable amount of effort, about 7% or over 700 days, from the season when turtles are more likely to be present in the Mid-Atlantic (June 15 – October 31). By limiting limit effort in this manner, the measure is expected to have beneficial effects on sea turtles, but not more than minor impacts on the scallop fishery.

The caveat that allows vessels that trade-in additional Mid-Atlantic trips to use two instead of one during this period also attempts to reduce the distributional impacts of this measure. Since FW22 is allocating split trips, some vessels may be allocated more trips in Mid-Atlantic access areas than other vessels, and some may choose to trade-in additional Mid-Atlantic trips. For these reasons the Council did not want the RPM to have a potentially much greater impact on some vessels compared to other vessels. Furthermore, area rotation is currently very successful because vessels are given the flexibility to trade trips, and if this RPM is too constraining, particularly for vessels from the south that are homeported near these areas, it could compromise the effectiveness of the area rotation program and have high distributional impacts.

- **Eliminate the Georges Bank closed area rotation schedule (Section 2.13)**

The rotation schedule for Georges Bank closed areas has often caused problems when determining the openings during the setting of specifications, especially when actions are effective after the start of the fishing year. This alternative would eliminate all reference to the GB access area schedule.

Rationale: The Council decided to eliminate the rotation schedule and the opening and closing of access areas in the regulations to reduce confusion and administrative burden. Instead, access area schedules will be based solely on survey results and available exploitable biomass as assessed by the PDT and SSC, and approved by the Council.

Other alternatives were considered in this action but are not part of the final preferred alternative. The Council took No Action related to the following sections:

- Section 2.8 (Consideration of a new rotational area);
- Section 2.10 (Modifications to VMS);
- Section 2.11 (Revisit the possession limit of in-shell scallops seaward of the VMS demarcation line); and
- Section 2.12 (Extension of unused 2010 ETA trips through May 31, 2011)

Table 2 - Summary of alternatives (proposed action in bold)

	Alternative	Description
2.3	**Acceptable Biological Catch** 2.3.1 No Action **2.3.2 New ABC values**	ABC = 2010 value (29,578 mt) **ABC for the fishery, excluding discards and incidental mortality (combined est. 9 mil lbs) is 27,276 mt (60.1 mil lbs) in 2011 and 28,968 mt (and 63.9 mil lbs) in 2012**
2.4	FW22 Allocation Alternatives	
	No Action	Rollover measures from 2010 – 38 DAS with 4 access area trips (1 in NL, 2 in ETA and 1 in Del)
	Alternative 1 – split trips and no GSC closure	**Allocates 32 DAS in 2011 with 4 access trips, and 34 DAS in 2012 with 4 access trips; access trips are split across the fleet by lottery; includes default measures that allocate 26 DAS and 4 trips in 2013**
	Alternative 2 – no split trips and no GSC closure	Allocates 32 DAS in 2011 with 4 access trips, and 34 DAS in 2012 with 4 access trips; trips are not split across fleet
	Alternative 3 – split trips and 1-year GSC closure	Allocates 22 DAS in 2011 and 23 DAS in 2012 with 5 access trips in 2011 and 6 in 2012; Great South Channel area is closed in 2011 and re-opens with 2.5 trips in 2012
2.6	LAGC Allocations 2.6.1 No Action for LAGC allocations **2.6.1 Updated allocations for LAGC IFQ vessels**	 LAGC allocations would be the same as 2010 **LAGC receives 5.5% of overall fishery ACL with specific number of trips per area based on new allocation from FW22 alternatives**
2.6.3	**NGOM Hard TAC**	**2.6.3.1 TAC of 70,000 pounds (No Action)** and 2.6.3.2 Alternative to reduce TAC to 31,000 lbs.
2.6.4	**Incidental catch**	**50,000 pounds (No Action)**
2.7	**TAC set-asides for research and observers** 2.7.1 No Action **2.7.2 Update TAC value**	 DAS and pounds available in 2010 **1.25 million pounds for research and 1% of ACL for observers (A15)**
2.7.2.2.1	Research priorities for 2011	These were already set and do not need action.
2.7.2.2.2	**Research priorities for 2012 and 2013**	**A host of mostly minor changes and updates were made to RSA priorities**
2.9.1	Turtle RPMs	
2.9.1.1	No Action	FW21 measures would rollover
2.9.1.2	Restrict the number of open area DAS a vessel can use between July and September in the Mid-Atlantic	A vessel could only use 1 trip during this period unless they traded up to four trips in which case they could use 2

	Alternative	Description
2.9.1.3	**Restrict the number of access area trips in the MA that can be used between June 15 and October 31**	**A vessel could only use 1 trip during this period unless they traded up to four MA trips in which case they could use 2 during the turtle window**
2.9.1.4	Seasonal closure for Delmarva	
	2.10.1.4.1	September through October
	2.10.1.4.2	July through October
2.9.1.5	Seasonal closure for Hudson Canyon in 2012 and 2013	
	2.10.1.5.1	August through September
	2.10.1.5.2	July through September
2.9.1.6	Combined measures	Not needed unless stand-alone RPMs do not have more than minor effect
2.10	**2.11.1 No Action** 2.11.2 Modifications to VMS	**No changes to VMS regulations** The measure seeks to create a way to turn the VMS off if it does not intend to land scallops
2.11	**2.12.1 No Action** 2.12.2 Re-visit bushel possession limit seaward of demarcation line	**No change to the possession limit seaward of the VMS demarcation line** Some value other than 100 bushels may be considered to account for uncertainty
2.12	**2.13.1 No Action** 2.13.2 Extension of unused ET trips	**Unused ETA trips expire at the end of FY 2010** Full-time vessels could use any unused FY 2010 ETA trips through May 30, 2011 because of low catch rates
2.13	2.14.1 No Action **2.14.2 Eliminate schedule of GB access areas in regulations**	No changes to the regulations related to timing of GB access area schedules **Eliminate any reference to the three-year schedule of access areas on GB**

2.2 SUMMARY BACKGROUND INFORMATION ON AMENDMENT 15 AND LATE IMPLEMENTATION OF FRAMEWORK 22

This section describes what would happen if no action is taken on Framework 22 overall but NMFS approves Amendment 15 to the Scallop FMP. The No Action alternatives specific to Framework 22 alternatives are each discussed separately among each management measure considered for this Framework. The information on Amendment 15 provided below is to provide general background information. This section also includes a description of the 2010 fishing year measures that will automatically carry over to the start of the 2011 fishing year in the event that Framework 22 is implemented after the start of the 2011 fishing year.

2.2.1 No Action for Framework 22; NMFS Approves Amendment 15

Although Amendment 15, if approved, will set up a process for determining annual catch limits (ACLs) and accountability measures (AMs), the amendment does not include specific scallop fishery allocations for FY 2011 and beyond. Specific TACs would be set by Framework 22, based upon the process outlined in Amendment 15.

If Amendment 15 is implemented as the Council approved it, ACL structure and accountability measures for the scallop fishery and for yellowtail flounder caught as bycatch in the scallop fishery, changes to the overfishing definition, general category individual fishing quota (IFQ) program, EFH closed areas, and research set-aside program will all be put in place in mid-2011. An ACL flow chart will be used which is based on the structure Overfishing Limit (OFL) > acceptable biological catch (ABC) = ACL > Annual Catch Target (ACT). ABC will be set at a level that has a 25 percent probability of exceeding the fishing mortality (*F*) associated with OFL. Sub-ACLs will be administered for the LA and LAGC fisheries at 94.5% and 5.5% of the overall ACL, respectively. The LA sub-ACT will then be set at an *F* rate with 25% probability of exceeding the LA sub-ACL to account for management uncertainty. The LAGC sub-ACT will be set equal to the LAGC sub-ACL. The limited access fishery will use an ACT as AM, with an additional AM that will reduce overall DAS in the subsequent year to account for an overage of the LA ACL. There will be a disclaimer that if overall *F* is re-estimated after the fishing year has ended and is more than one standard deviation below overall F for the fishery ACL, AMs for the LA fishery will not be triggered. In addition, if the limited access disclaimer is triggered, then 5.5% of the difference between the original limited access sub-ACL and the actual limited access landings will be allocated to the limited access general category IFQ fleet the next year. The poundage will be deducted directly from the following year's limited access sub-ACL and will be divided among the IFQ fleet the same way that all quota is divided now. The AM for the LAGC fishery will be on an individual basis, IFQ reductions the following year if an overage occurs.

Yellowtail flounder will be managed in the scallop fishery through a non-target species sub-ACL. If the yellowtail flounder sub-ACL is exceeded, the following AM will apply: If, by January 15 of each year, the Regional Administrator determines that a yellowtail flounder sub-ACL for the scallop fishery will be exceeded, the specified statistical areas with highest YT bycatch rates will be closed to scallop fishing on March 1 and remain closed for a specified length of time depending on the percentage overage. Closures will not apply to general category trips in exempted areas. To make monitoring more effective for this AM, VMS will be expanded to include daily reports for each trip of yellowtail flounder catch and all other species landed by YT stock area. Any overages of the yellowtail sub-ACL for the scallop fishery in 2010 will also be subject to the same AM described above upon implementation of this action.

The "hybrid" overfishing definition will be implemented and reference points will be changed from F_{max} and B_{max} to F_{msy} and B_{msy}. In the limited access general category fishery, the possession limit will be raised to 600 lbs, a rollover of 15% of original annual allocation will be allowed if unused, the maximum quota one vessel can harvest will be increased to 2.5%, and LAGC quota can be split from a permit for LAGC IFQ vessels only, not for LA vessels with LAGC permits. EFH closed areas will be modified to be consistent with EFH areas closed under multispecies Amendment 13. A host of improvements will be made to the RSA program. Finally, specifications packages for this FMP will now include a third year to be used in the interim if the action is not implemented before the start of the fishing year. These third year specs will be superseded by the next specification package as soon as it goes into effect.

2.2.2 Measures that will be in effect March 1, 2011 until Framework 22 is implemented

Because Council final action has been moved back to the November Council meeting, Framework 22 will not be implemented before the start of FY2011 and several measures implemented by Framework 21 will carry-over. For example, open area DAS allocations for limited access vessels would be the same at the start of FY 2011 as in FY2010 (38 DAS for full-time, 15 for part-time, and 3 for occasional vessels) and the ETA would be managed under the same regulations in place in 2010 (two trips for full-time vessels and a total of 1,377 general category trips). In addition, under No Action the Mid-Atlantic access area allocations would rollover. HCA would remain closed and vessels would get one trip in the DMV area and one trip in NLA. As a result of the delay in Framework 22 past the March 1 start of FY 2011, this action will have to assess impacts of the potential delay and consider measures to compensate.

The specific measures that are included in this alternative if this action is not implemented by March 1, 2011, are:

1. Any limited access open area DAS used in 2011 above the ultimate value allocated for 2011 will be reduced the following fishing year (2012).
2. IFQ-only vessels without a limited access part-time, full-time, or occasional scallop permit will receive an IFQ based on a TAC of 1,055 mt, which is 5% of 2010 projected catch value of 21,445 mt, after accounting for research and observer set-asides. IFQ vessels that have also been issued a limited access part-time, full-time, or occasional scallop permit will receive an IFQ based on a TAC of 106 mt, which is 0.5% of the 2010 projected catch value of 21,445 mt. If these TACs differ from 2011 final projected catch values, 2011 IFQs will be adjusted either up or down, depending on the difference in the projected catch. If the 2011 projected catch value is less than the 2010 projected catch value, and if a vessel exceeds its ultimate 2011 IFQ before the 2011 IFQs are adjusted, the vessel's 2012 IFQ will be deducted by the same amount. A vessel that increases its IFQ through a lease will use leased IFQ before using its own IFQ, and multiple leases of IFQ will be used in the order that it was leased by the vessel. IFQ for the 2012 fishing year will be deducted from either the leased or the vessel's own IFQ that resulted in the excess catch.

3. Any landings from within the Northern Gulf of Maine (NGOM) area caught in fishing year 2011 above the ultimate TAC for 2011 will be reduced the following year.
4. The access area management measures to minimize turtle interactions applicable to the FY 2010 allocations would also roll over, closing the ETA and DMV in September and October and limiting the number of MA access area trips in the summer and fall to two trips.
5. If final allocations vary from 2010 allocations in terms of number of access area trips and possession limits, it may be necessary to change possession limits for part-time and occasional vessels to maintain the allocation differences between permit categories. For example, part-time vessels are allocated 40% of a full-time permit; and with access areas that is a combination of access area trips and possession limit. So if a part-time vessel takes more tips and possession than the ultimate 2011 allocations, their possession limit for 2012 may need to be adjusted.
6. Any limited access full-time vessel that fishes an access area trip in the ETA will have those pounds converted to DAS and deducted from their open area DAS allocation in 2012. Unless that vessel already started part of that trip. Under current regulations a vessel can fish the remainder of a broken trip up to 60 DAS into the next fishing year. So a vessel can fish the remainder of a trip in ETA until May 1, but if the vessel did not start a trip before February 28, that trip will be deducted in equivalent DAS in 2012. For example, a full trip is 18,000 lbs, and according to the projections for the Alternative 1 alternative, the average meat count is estimated to be 18.4, implying that 18,000*18.4 = 331,200 scallops will be removed per trip. In the open areas, the average meat count is estimated to be about the same, 18.4 so the same 331,200 scallops would be removed if that trip moved into open areas. The estimate of open area LPUE generated from the model for this alternative is 2,441, so it will take 18,000/2,441 = 7.4 DAS to land the same number of scallops, so those DAS would be subtracted from that vessels overall DAS allocation in FY2012. It should be noted that there is an alternative in this document that could make this provision moot. Alternative 2.12 is considering whether a vessel can use unused ETA trips through June 1, 2011. If that is selected, then all fishing in this area will be accounted for up to allocated 2012 amounts. The Council did not select Alternative 2.13 as part of the proposed action.
7. If a limited access vessel fishes in NL during FY2011 before FW22 is implemented any pounds caught would be deducted in FY2012 from that vessels' NL allocation should it be allocated to them, or from another access area to which that vessel has an allocation.

2.3 ACCEPTABLE BIOLOGICAL CATCH

The MSA was reauthorized in 2007. Section 104(a) (10) of the Act established new requirements to end and prevent overfishing, including annual catch limits (ACLs) and accountability measures (AMs). Section 303(a)(15) was added to the MSA to read as follows: ''establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.'' ACLs and AMs are required by fishing year 2010 if overfishing is occurring in a fishery, and they are required for all other fisheries by fishing year 2011. The Council initiated Scallop Amendment 15 to comply with these new ACL requirements, and that action is expected to be implemented in June 2010, just after the start of the 2011 fishing year. However, the Act also requires that an acceptable biological catch be set in each fishery, and that provision is required in actions that set specifications after the Act was implemented (January 2007). Therefore, FW21 implemented ABC for 2010; the value was 29,578 mt (65.2 million pounds) for the overall fishery, including an estimated 3,363 mt (7.4 million pounds) for non-yield fishing mortality (discards and incidental mortality). Therefore, the overall ABC for the fishery, excluding discards and incidental mortality was 26,219 mt (57.8 million pounds).

Acceptable Biological Catch (ABC) is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. The determination of ABC will consider scientific uncertainty and the Council may not exceed the fishing level recommendations of its Science and Statistical Committee (SSC) in setting ACLs (Section 302(h)(6)). The MSA enhanced the role of the SSCs, mandating that they shall provide ongoing scientific advice for fishery management decisions, including recommendations for acceptable biological catch (MSA 302(g(1)(B)). This requirement for an SSC recommendation for ABC was effective in January 2007.

2.3.1 No Action for ABC

Under "No Action" for FY 2011 and FY 2012, the overall ABC for each year would be identical to that of FY 2010 (29,578 mt; 65.2 M lb), resulting in an ABC for the fishery of 26,219 mt (57.8 M lb), after accounting for discards (3,363 mt; 7.4 M lb). In addition, a default ABC for 2013 would also be 29,578 mt. or 65.2 million pounds.

2.3.2 ABC for 2011 and 2012, and default for 2013 (PROPOSED ACTION)

Therefore, while the full ACL program will not be implemented in the Scallop FMP until 2011 under Amendment 15 (if approved), this action will include ABC for 2011, 2012, and 2013 as a default until a subsequent action sets measures for 2013 and 2014. The SSC reviewed an analysis prepared by the Scallop PDT on August 24-26, 2010. The ABC calculation is based on the same analyses used for setting ABC in FW21 that was developed for inclusion in Amendment 15; it was just updated with 2010 data.

The SSC reviewed the SAW50 and PDT analyses and concluded that they provide the information needed for ABC recommendations. The SSC endorses the SAW50 Review Panel recommendation to define overfishing on the basis direct estimates of F_{MSY}, as intended in the Magnuson-Stevens Fishery Conservation and Management Act. The transition from using F_{max} as a proxy for F_{MSY} is consistent with the October 2008 advice from the SSC: "*Although F_{max} may be a reasonable proxy for F_{MSY}, the SSC recommends more explicit consideration of long-term sustainable yield, rather than maximizing yield-per-recruit*." The SSC considers the SAW50 estimate of F_{MSY} to be based upon best scientific information available for management of the scallop fishery.

While some uncertainties are not accounted for in the stochastic analysis (e.g. spatial heterogeneity in fishing mortality, uncertainty in the magnitude of total 2010 catch, spatial population structure, uncertainty in projected biomass, and minor retrospective inconsistencies) , the SSC concludes that the PDT's stochastic evaluation of current fishing mortality and F_{MSY} is a sufficient basis to derive ABC using the accepted control rule (i.e., 25% probability of overfishing). Note that the 'yield' in the PDT's calculations and the ABC recommendation includes dead discards and incidental mortality. Therefore, the realized frequency of overfishing may be more or less than expected from the risk analysis.

The SSC reported the following recommendations at the September 2010 Council meeting:

1. **The 50th Stock Assessment Workshop and Plan Development Team analyses provide the information needed for Acceptable Biological Catch recommendations. The new estimate of F_{MSY} is based upon the best scientific information available for management of the scallop fishery**
2. **Acceptable Biological Catch for the scallop fishery is 31,279 mt in 2011 and 33,234 in 2012.**

The SSC's catch recommendations included mortality from discards and incidental catch. About nine million pounds of scallops are estimated to be killed each year due to discard and incidental catch mortality. After this source of mortality is removed, the ABC available to the fishery is 60.1 million pounds (27,276 mt) for 2011 and 63.8 million pounds (28968 mt) for 2012. The value after discards mortality is removed is the value that will be used as the ABC for the fishery, equivalent to ACL.

Table 3 – Summary of ABC approved by the SSC and Council for FW22 (shaded). ABC value used in the regulations and amount available to fishery after discards removed in BOLD

Year	**ABC available to fishery after discards removed**	Discards	ABC plus discards	Exploitable Biomass
2011	**60,117,237**	8,838,241	68,957,683	161,982,985
2012	**63,847,421**	9,420,256	73,267,676	184,291,332

When the SSC reviewed ABC values for Framework 22 this action was only a two year framework. At the September 2010 Council meeting the Council decided under Amendment 15 that scallop frameworks should include a third year as default measures to address problems associated with late implementation of framework actions (Section 3.4.5.3 of Amendment 15). The PDT estimated ABC for 2013 using the same approach reviewed and approved by the SSC (NEFMC, 2009). The values for 2013 have been included as well, and will likely be updated in a future framework action when final measures for 2013 are set.

Table 4 – Summary of ABC values for 2013 that will likely be replaced in a subsequent action with updated information

Year	**ABC available to fishery after discards removed**	Discards	ABC plus discards
2013	**63,272,680**	9,335,456	72,608,136

2.4 SUMMARY OF FW22 ALLOCATION ALTERNATIVES FOR LIMITED ACCESS VESSELS

The PDT explored the most appropriate alternatives for these years. Each includes 4 access area trips in each year, except for the South Channel closure option (Alternative 3) which would have 5 in 2011 and 6 in 2012. DAS allocations will be set at $F = 0.38$ in open areas – the F rate equivalent to OFL to prevent overfishing. Under the hybrid overfishing definition selected in Amendment 15, the maximum level that open area fishing can be set is 0.38.

The PDT explored the possibility of allocating "split trips; half the fleet in one access area and half the fleet in another access area to optimize yield. There are several areas that cannot support a full trip each year for the entire fleet, so instead half the fleet would be allocated a full trip in one area, and half the fleet would be allocated a full trip in another area. Vessels would be permitted to trade trips with vessels in their permit category within the same fishing year. Trips will likely be allocated by some sort of lottery. The Committee requested that the PDT develop a way to allocated access areas by lottery. It was specified that the allocation should be done randomly (not regionally-based) and it should be transparent. A public posting of who received trips should be available to the fleet to increase ease of trading, and this lottery should be included in the publication of Framework 22 as trip allocation by vessel. This lottery process is described in more detail in Section 2.4.2.

Overall, 4 allocation alternatives were considered for this specification package: No Action, Alternative 1 (split trip), Alternative 2 (no split trips), and Alternative 3 (new closure area and split trips). These alternatives or scenarios will be referred to as No Action, Alternative 1, 2, and 3 throughout the rest of the document and analyses.

2.4.1 Allocation alternatives or scenarios

2.4.1.1 No Action

In terms of fishery allocations for access areas and open area DAS, "No Action" is exactly what it implies: no additional action will be taken and so the measures <u>and</u> allocations that are specified in the present regulations (CFR §648, Sub-part D) are maintained. The scallop regulations state (paragraph 648.55(b)): "If the biennial framework action is not undertaken by the Council, or if a final rule resulting from a biennial framework is not published…with an effective date on or before March 1…the measures from the most recent fishing year shall continue, beginning March 1 of each year." Table 5 is a summary of the open area DAS allocations for 2011 and 2012 and Table 6 is a summary of the access area schedule for No Action. Table 8 compares the allocations under No Action to the alternatives under consideration in Framework 22.

Under "No Action," in open areas for both FY 2011 and FY 2012, full-time limited access scallop vessels would receive the same allocation as in FY2010: an allocation of 38 open area DAS. Part-time and occasional vessels would receive a pro-rata share of 40% and 1/12th, respectively, which is equivalent to 15 and 3 open area DAS, respectively (Table 5).

The FY 2010 trip allocations for access areas would also roll over into FYs 2011 and 2012. Full-time vessels would receive 2 Elephant Trunk Access Area (ETA) trips, one trip in Delmarva

(DMV), and one trip in the Nantucket Lightship Access Area (NLA), part-time vessels would receive 2 access area trips to be taken in any of the areas (either both in the ETA; one in the ETA and one in DMV, one in the ETA or one in NLA, or one in DMV and one in NLA), and occasional vessels would receive one access area trip that could be taken in any one of these access areas (Table 6). LAGC IFQ vessels in FYs 2011 and 2012 would be allocated 714 fleet-wide trips in both the NLA and DMV, as well as 1,377 fleet-wide trips in the ETA. However, some of these access areas may not be accessible to vessels due to the access area rotational closure schedule (2 years open, 1 year closed) currently stated in the regulations, resulting in areas closing even though trips may have been allocated there in FY 2010 or areas opening but without allocations from FY 2010 (Table 7). Changes to the rotational closure schedule from FY 2010 to FY 2011 and FY 2012 are as follows:

- The NLA was open in FY 2010 and would remain open in FY 2011 but is scheduled to close in FY 2012 under “No Action”, resulting in full-time and LAGC IFQ being unable to fish their individual or fleetwide trips, respectively, in NLA in FY 2012. Part-time and occasional vessels would have other areas to fish their full trip allocation but those options may not be preferable over NLAA.
- Closed Area I (CAI) and Closed Area II (CAII) were closed in FY 2010 and are scheduled to open in FYs 2011 and 2012, but no trips would be allocated because none were allocated in FY 2010.
- The Hudson Canyon Access Area (HCA) would remain closed with no trips allocated.
- In addition, under “No Action”, DMV and the ETA would continue to be access areas in FYs 2011 and 2012 because, unlike the other scallop access areas, ETA and DMV do not have specific scheduled closure dates. According to the current regulations, these access areas would revert to open areas in FY 2011 (for DMV) and FY 2012 (for both ETA and DMV). However, due to the rollover of FY 2010 access area allocations into FYs 2011 and 2012, vessels would still be allocated specific access area trip allocations, rather than being allocated individual DAS allocations that would be adjusted for the fact that the biomass in these areas now applies to open areas from which DAS are derived.

In summary, due to the rollover FY 2010 allocations and the access area rotational closure schedule stated in the regulations, full-time vessels would be able to use all three of their Mid-Atlantic access area trips in FY 2011 and FY 2012 and only use their one NLA access area trip in FY 2011, but not FY 2012. The NLA closure would affect part-time and occasional vessels in FY 2012, as they would be restricted to using their two trip allocations in DMV or ETA. Similarly, LAGC IFQ vessels would be able to use the fleet-wide trips in the ETA, NLA, and DMV in FY 2011 but would only be able to use their FY 2012 allocations in ETA and DMV.

If the NLA access area closes due to yellowtail flounder catches in FY 2011 (when it is accessible to vessels), vessels would receive compensation for each access area trip not taken due to the closure based on the DAS conversion used in FY 2010 (1 trip equates to 5.8 DAS).

The “No Action” alternative outlined in this section assumes “No Action” for Amendment 15, which is being developed and finalized concurrently with Framework 22. The Council made its final decision on Amendment 15 management measures at its September 2010 meeting, with an implementation deadline of June 2011 – up to four months after the March 1 start of the 2011 fishing year. The "No Action" alternative for Amendment 15 has been outlined in Section 3.1 of that document and is not repeated here.

The various analyses of the alternatives in this document focus on the No Action alternative outlined in this section, because this represents the measures that would rollover if no action is taken on FW22 and is the most appropriate baseline for comparison according to NMFS guidelines. There are also some analyses comparing the alternatives to Status quo, and alternative that is similar to FY 2010 management measures.

Table 5 – Open area DAS allocations under No Action. These values are identical to those of FY 2010.

Full-Time		Part-Time		Occasional	
2011	*2012*	*2011*	*2012*	*2011*	*2012*
38	38	15	15	3	3

Table 6 – Access area trip allocations under No Action.

These values are identical to those of FY 2010. However, the access area rotational schedule in Table 4 results in changes from FY 2010, which is particularly relevant to FY 2012 because full-time vessels cannot utilize the 1 trip allocation into NLAA since that area is scheduled to be closed under No Action.

Area	NLA		CAI***		CAII***		ETA		DMV	
Fishing Year	***2011***	***2012****	***2011***	***2012***	***2011***	***2012***	***2011***	***2012***	***2011***	***2012***
Full-time	1	0	0	0	0	0	2	2	1	1
Part-time*	Up to 1	0	0	0	0	0	Up to 2	Up to 2	Up to 1	Up to 1
Occasional*	Up to 1	0	0	0	0	0	Up to 1	Up to 1	Up to 1	Up to 1
General Category	714	0	0	0	0	0	1,377	1,377	714	714

* Part-time and occasional scallop vessel owners could determine which areas to take their trips, up to the maximum number of trips specified in the table above
** Scheduled to be closed in 2012, although FY2010 trip allocation would remain in place.
***Scheduled to be open, but not trips allocated.

Table 7 -Sea scallop access area allocation schedule under No Action, based on current area rotational schedule stated in the scallop regulations.

	2011	2012
CAII	Open – but no allocation	Open – but no allocation
NLA	Open	Closed – trip allocations cannot be utilized (Full-time, LAGC IFQ vessels)
CAI	Open – but no allocation	Open – but no allocation
ETA	Open	Open
HCA	Closed	Closed
DMV	Open	Open

2.4.1.2 Alternative 1 (PROPOSED ACTION)

The PDT discussed allocating a full trip to half the fleet in one area, and half the fleet in another area. In terms of allocating scallop fishing effort this alternative was designed to allocate as much effort through trip allocations in an area as possible. In addition, this alternative is expected to be more beneficial in terms of YT bycatch because it allocated less effort in CA2 in 2012, which is part of the GB seasonal closure area proposed in Amendment 15. It is unclear yet if allocating half the fleet a trip in one area and half the fleet a trip in a different area will have issues; therefore, Alternative 2 was developed to allocate integer trips per area.

2.4.1.3 Alternative 2

This alternative may be less favorable than Alternative 1 in terms of allocating as much scallop effort as possible per area because in some cases it allocated more than ideal, and in other cases less. For example, by allocating a full trip in Delmarva in 2012, there may not be enough biomass to support a full trip in Delmarva in 2013. Similarly, allocating a full trip in NL results in a higher fishing mortality for that area than Alternative 1. However, if there are issues with allocating trips in one area to half the fleet and trips in another area for the other half of the fleet, then this alternative would be more favorable than Alternative 1.

2.4.1.4 Alternative 3

In addition, the PDT developed an option that would close an area in the Great South Channel for one year (2011) and reopen it in 2012 (Alternative 3). <u>Allocation from Alternative 1 would be combined, except for CA1 schedule from Alternative 2, with a closure in the Channel</u>. Growth rates are at 46% for scallops in the Channel, area rotation guidelines for closure is 30% according to the adaptive area rotation program considered in Amendment 10. Therefore, closing the area even for one year would increase yield from that area substantially. More information about this potential closure is included in Section 2.8.

Most of the tables and discussion of alternatives in this document refer to the allocation of limited access full-time vessels. For all three alternatives, part-time limited access scallop vessels would be allocated two access area trips with a possession limit of 14,400 pounds. These vessels can take one trip in any area open to the fishery, and up to 2 trips in areas that have 1.5 trips allocated to full-time vessels since some full-time vessels could be allocated two trips in those areas. For occasional vessels they would be allocated 1 trip in any access area open to the fishery that year with a possession limit of 6,000 pounds. These allocations reflect the allocations intended under Amendment 4: 40% for part-time vessels and 8.33% for occasional vessels.

Table 8 – Framework 22 alternatives under consideration

	CA1	CA2	NL	HC	Del	ET	Total	Channel	OA DAS
Alternative 1 (proposed action)									
2011	1.5	0.5	-	1	1	-	4	open	32
2012	0.5	1	0.5	1.5	0.5	-	4	open	34
Alternative 2									
2011	2	-	-	1	1	-	4	open	32
2012	-	1	1	1	1	-	4	open	34
Alternative 3									
2011	2	1	-	1	1	-	5	closed	22
2012	-	1	0.5	1.5	0.5	-	6	Open (2.5)	23
No Action									
2011	-	-	1	-	1	2*	4	open	38
2012	-	-	-	-	1	2*	3*	open	38
SQ - 2010									
2011	1.5	0.5	-	1	1	-	4	open	38
2012	0.5	1	0.5	1.5	0.5	-	4	open	38

** Trips may be allocated to this area, but there is not sufficient biomass in this area to support that effort, so trips will not be complete and catch for the area will be substantially lower than 2 trips typically produce, closer to 5 million compared to 12 million pounds.*

2.4.2 Lottery system for allocating split trips

This is not a stand-alone alternative. Once the Committee selected Alternative 1 as the preferred alternative, which includes allocation of split trips, a mechanism had to be developed to identify how trips would be allocated across the fleet. This section explains how that mechanism will work and how trips will be allocated across the fleet on a random basis.

The Advisory Panel and Scallop Committee met in early November before the Council took final action on this framework and identified Alternative 1 as the preferred alternative and requested that the PDT develop a way to allocate access areas by lottery for the "split trips". It was specified that the allocation should be done randomly (not regionally-based) and it should be transparent. A public posting of who received trips should be available to the fleet to increase ease of trading, and this lottery should be included in the publication of Framework 22 as trip allocation by vessel.

The PDT got a final list of limited access scallop permits in January 2011. For FY2011, each full-time vessel is allocated one trip in CA1, HC, and Delmarva. The forth trip comes from either CA1 or CA2 depending on which area that vessel is assigned based on the results of the randomized lottery allocation. Permit numbers are sorted based on a simple random number generator and an allocation is made to one area or the other. At the end each permit number has been allocated a trip in either CA1 or CA2 on a completely random basis using Microsoft Excel's random number generator function.

Assuming all of these permits are renewed for FY2011 the allocations below reflect the random allocation of split trips and regular access area allocations for FY2011. These allocations are subject to NMFS final approval of FW22 and will not be effective until after FW22 is implemented, but have been included in this action so the allocations are transparent and available as soon as possible so vessels can plan whether they plan to trade trips and with whom. Table 9 below describes the trip allocations for FY2011 only. A corrected table may be posted by NMFS to reflect any future vessel replacements or ownership changes not captured in the current list of permits. A corrected table would be sent to all vessels by permit letter if corrections are needed. For FY2012 and beyond, similar tables will be generated by NMFS and sent to permit holders by letter as well as posted on the Regional Office website.

Table 9 – Full-time limited access scallop access area allocations for 2011 (ordered numerically by permit number)

	Delmarva	Hudson Canyon	Closed Area 1	Closed Area 2	Total Trips	Permit	Vessel or CPH Name	Owner	Address 1	Address 2	City	State	Zip	Telephone
1	1	1	1	1	**4**	220886	SUSAN MARIE	SOUTH BAY SEAFOOD INC	4408 PARK BOULEVARD		WILDWOOD	NJ	08260	609-522-3400
2	1	1	1	1	**4**	250968	ALEXANDRA L	BLUE BILL FISHERIES INC	P O BOX 497		CAPE MAY	NJ	08204	609-884-3405
3	1	1	2	0	**4**	251687	BELLA ROSE	CHALLENGE FISHERIES INC	PO BOX 173	LEIGHTON ROAD	BASS HARBOR	ME	04653	207-266-1960
4	1	1	2	0	**4**	251729	NEGOTIATOR	T & T FISHERIES LLC	118 SPRINGERS MILL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-463-0768
5	1	1	2	0	**4**	251730	SOVEREIGN STAR	SOVEREIGN STAR FISHING INC	113 MACATHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
6	1	1	1	1	**4**	310909	JENNA LEE	JENLEE FISHERIES INC	PO BOX 34		CENTERVILLE	MA	02632	508-790-3181
7	1	1	2	0	**4**	310912	INHERITANCE	MONTREAL FISHING CORP	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
8	1	1	2	0	**4**	310915	AMANDA ASHLEY	JULIE RENEE INC	552 ROWE ROAD		AURORA	NC	27806	252-670-1176
9	1	1	1	1	**4**	310918	KARINA	KARINA LLC	47 EAST BEAVER DRIVE		CAPE MAY COURTHOUSE	NJ	08210	609-374-3465
10	1	1	1	1	**4**	310927	JEFFREY SCOTT	TRAWLER RICHARD HEATH, INC.	PO BOX 3321		NEW BERN	NC	28564	252-637-1552
11	1	1	1	1	**4**	310928	COOL CHANGE	J T B K FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
12	1	1	1	1	**4**	310941	COVE	COVE FISHING CORP	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-789-3067
13	1	1	1	1	**4**	310945	GRAND LARSON III	GRAND LARSON INC	PO BOX 731	18 EAST 13TH STREET	BARNEGAT LIGHT	NJ	08006	609-548-1625
14	1	1	2	0	**4**	310947	MS MANYA	CAPT JOHN INC	16 EAST 12TH STREET	BOX 609	BARNEGAT LIGHT	NJ	08006	609-494-2094
15	1	1	1	1	**4**	310963	MISS TAYLOR	B DOCK SEAFOOD LLC	103 LEDDON STREET		MILLVILLE	NJ	08332	856-507-5566
16	1	1	1	1	**4**	310982	ANDY TWO	FV ANDY ONE INC	3018 CALCUTT DRIVE		MIDLOTHIAN	VA	23113	804-379-5717
17	1	1	1	1	**4**	310985	KATHRYN MARIE	KATHRYN MARIE SCALLOPING COMPANY LLC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
18	1	1	1	1	**4**	310986	MISS LESLIE	MASS FISHING CORP	1 CAPE STREET		NEW BEDFORD	MA	02740	508-993-9505
19	1	1	1	1	**4**	310994	FURIOUS	EMPIRE SCALLOP LLC	322 NEW HAVEN AVENUE		MILFORD	CT	06460	203-876-8923
20	1	1	1	1	**4**	310998	HELEN LOUISE	HELEN LOUISE INC	552 ROWE ROAD		AURORA	NC	27806	252-670-1176
21	1	1	1	1	**4**	320026	F NELSON BLOUNT	F NELSON BLOUNT INC	P O BOX 609		BARNEGAT LIGHT	NJ	08006	609-494-2094
22	1	1	2	0	**4**	320130	OCEAN WAVE	OCEAN WAVE SCALLOP CO INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
23	1	1	2	0	**4**	320134	ELIZABETH	THIRTY FATHOM FISH CORP	PO BOX 772	1809 CENTRAL AVENUE	BARNEGAT LIGHT	NJ	08006	609-494-2207
24	1	1	2	0	**4**	320306	MISS SUE ANN	FV MISS SUE ANN LLC	985 OCEAN DRIVE	PO BOX 555	CAPE MAY	NJ	08204	609-884-3000
25	1	1	1	1	**4**	320333	CAPT BUCKY SMITH	CAPE MAY BAIT INC	P O BOX 497		CAPE MAY	NJ	08204	609-884-3405
26	1	1	2	0	**4**	320394	SHEARWATER	G L HATCH INC	6 TOWN CLERK ROAD		OWLS HEAD	ME	04854	207-596-0185
27	1	1	2	0	**4**	320411	ADVENTURESS	FV ADVENTURESS LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
28	1	1	1	1	**4**	320416	ADRIANNA	F/V ADRIANNA LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
29	1	1	2	0	**4**	320422	NORREEN MARIE	FV NORREEN MARIE LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
30	1	1	1	1	**4**	320571	LINDSAY L	LINDSAY L INC	PO BOX 731	18 E 13TH STREET	BARNEGAT LIGHT	NJ	08006	609-494-7392
31	1	1	2	0	**4**	320582	ASHLEY GAIL	ISLAND PRIDE SEAFOOD INC	5430 WHITE HALL ROAD		GLOUCESTER	VA	23061	757-880-1919
32	1	1	2	0	**4**	320634	WILLIAM LEE	CARKEZ FISHERIES, INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-965-0525
33	1	1	2	0	**4**	320655	ATLANTIC WARRIOR	ATLANTIC WARRIOR INC	4408 PARK BOULEVARD		WILDWOOD	NJ	08260	609-522-3400
34	1	1	1	1	**4**	320814	MASTER BRAXTON	TRAWLER MASTER BRAXTON INC	PO BOX 250	101 SOUTH AVENUE	ORIENTAL	NC	28571	252-249-0123
35	1	1	1	1	**4**	320857	GASTON BELL	CHESAPEAKE ATLANTIC SFD HRVST INC	PO BOX 250	4146 ORCHARD CREEK RD	ORIENTAL	NC	28571	252-249-0123
36	1	1	1	1	**4**	321022	ALEXANDRIA DAWN	ALEXANDRIA DAWN FISHERIES INC	PO BOX 825		MONTAUK	NY	11954	631-834-1878
37	1	1	2	0	**4**	321056	LADY LORRAINE	FV MICHELLE INC	985 OCEAN DRIVE	P O BOX 555	CAPE MAY	NJ	08204	609-884-3000
38	1	1	1	1	**4**	321109	TENACIOUS	FV TENACIOUS LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
39	1	1	2	0	**4**	321122	MISS SHAUNA	MISS SHAUNA LLC	1 CAPE STREET		NEW BEDFORD	MA	02740	508-993-9505
40	1	1	2	0	**4**	321131	PRIDE & JOY	T&S FISHERIES LLC	118 SPRINGERS MILL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-463-0768
41	1	1	1	1	**4**	321135	ANN M	ANN M FISHING CORP	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
42	1	1	1	1	**4**	330126	PREDATOR	PREDATOR FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
43	1	1	2	0	**4**	330147	BAY STAR VII	BAY STAR VII LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	757-244-8440
44	1	1	2	0	**4**	330166	GOLDEN NUGGETT	F/V GOLDEN NUGGETT INC	940 SHIRLEY AVENUE		CAPE MAY	NJ	08204	609-886-1558
45	1	1	2	0	**4**	330191	BARBARA LEE	C & S FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
46	1	1	1	1	**4**	330215	PEROLA DO CORVO	SASHA FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
47	1	1	2	0	**4**	330258	GODS MERCY	GOD'S MERCY LLC	97 KEEL ROAD		GRANTSBORO	NC	28529	252-745-7243
48	1	1	1	1	**4**	330269	BAY STAR I	FIVE SEAS LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	804-244-8440
49	1	1	2	0	**4**	330272	CHALLENGE	CHALLENGE FISHERIES LLC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
50	1	1	2	0	**4**	330285	RELENTLESS	OAJ INC	1436 HIGHWAY 539	WARREN GROVE	BARNEGAT	NJ	08005	609-607-0841
51	1	1	2	0	**4**	330288	JEAN MARIE	JEAN MARIE INC	354 BROAD CREEK LOOP RD		NEWPORT	NC	28570	252-726-8158

52	1	1	2	0	4	330292	LILLIE BELLE	TRAWLER CAPT FUD LLC	PO BOX 3321		NEW BERN	NC	28564	252-514-7003
53	1	1	2	0	4	330301	EXPECTATION	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
54	1	1	1	1	4	330308	BARBARA PAULINE	BARBARA PAULINE INC	120 KEYPORT ROAD		NORTH CAPE MAY	NJ	08204	609-886-6729
55	1	1	1	1	4	330311	STACY LEE	STACY LEE LLC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
56	1	1	1	1	4	330325	OCEAN BOY	OCEAN BOY INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
57	1	1	1	1	4	330331	CAPT BOB	EDGAR SEAFOOD PRODUCTS INC	PO BOX 555		CAPE MAY	NJ	08204	609-884-3000
58	1	1	1	1	4	330336	MISS AMANDA	MISS AMANDA INC	354 CREEK LOOP ROAD		NEWPORT	NC	28570	252-726-8158
59	1	1	1	1	4	330348	BAY STAR V	BAY STAR V LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	757-244-8440
60	1	1	2	0	4	330361	LITTLE JESSE	RDM CORPORATION OF SUFFOLK	PO BOX 5415	2909 AMES COVE ROAD	SUFFOLK	VA	23435	757-869-9386
61	1	1	2	0	4	330368	VIRGINIA CLIPPER	B & C TRAWL INC	PO BOX 726		NEWPORT NEWS	VA	23607	757-869-4313
62	1	1	2	0	4	330370	BAY STAR IV	BAY STAR IV LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	757-244-8440
63	1	1	2	0	4	330378	CAPT PEABODY	WILLIAM F PEABODY	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
64	1	1	1	1	4	330380	ABRACADABRA	TRAWLER ABRACADABRA INC	688A TOWNBANK ROAD		NORTH CAPE MAY	NJ	08204	609-886-2575
65	1	1	1	1	4	330394	WILLIAM & LAUREN	F/V WILLIAM & LAUREN INC	PO BOX 866	5 WEST 8TH STREET	BARNEGAT LIGHT	NJ	08006	609-494-0367
66	1	1	2	0	4	330396	MOTIVATION	FV MOTIVATION LLC	118 SPRINGERS MILL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-425-8983
67	1	1	1	1	4	330399	LADY ROSLYN	FV LADY ROSLYN LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
68	1	1	2	0	4	330402	STEPHANIE B	BENAVIDEZ SEAFOOD INC	202 SCOTCH TOM WAY		GRAFTON	VA	23692	757-898-4307
69	1	1	2	0	4	330434	INSTIGATOR	CDK TRAWLERS INC	7312 PACIFIC AVENUE		WILDWOOD	NJ	08260	609-522-1598
70	1	1	1	1	4	330449	CAROLINA CAPES	LAS GUERAS INC	1636 JANKE ROAD		VIRGINIA BEACH	VA	23455	757-460-2716
71	1	1	1	1	4	330461	VIRGINIA LYNN	VIRGINIA LYNN COMMERICAL FISHING INC	536 SHARK LANE		MANAHAWKIN	NJ	08050	609-335-4828
72	1	1	2	0	4	330476	MIZ JUANITA B	CAPTAIN MARSHALL INC	PO BOX 210		SEAFORD	VA	23696	757-898-8512
73	1	1	2	0	4	330489	RAELEEN MICHELLE	WHITE FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
74	1	1	1	1	4	330491	EILEEN RITA	BILL AND EILEEN LLC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
75	1	1	1	1	4	330497	CAROLINA QUEEN II	CAROLINA QUEEN II INC	P O BOX 600		SEAFORD	VA	23696	757-898-8512
76	1	1	1	1	4	330504	LINDA	BOAT SANTA RITA II INC	1 MORETTO DRIVE		PEABODY	MA	01960	617-650-5436
77	1	1	2	0	4	330521	JERSEY CAPE	CAPE TRAWLERS INC	PO BOX 830		CAPE MAY	NJ	08204	609-884-7600
78	1	1	1	1	4	330535	SUSAN MARIE II	F/V SUSAN MARIE INC	4408 PARK BOULEVARD		WILDWOOD	NJ	08260	609-522-3400
79	1	1	2	0	4	330543	MISS WILMA ILENE	TRAWLER WILLIAM F PEABODY INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
80	1	1	2	0	4	330550	MISS MADDY	MADDY INC	PO BOX 731	18 EAST 13TH STREET	BARNEGAT LIGHT	NJ	08006	609-494-7392
81	1	1	1	1	4	330566	HAWK	HAWK SCALLOP CO INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
82	1	1	2	0	4	330568	COLUMBIA	BOAT COLUMBIA OF N.B., INC	22 SOUTH WATER STREET		NEW BEDFORD	MA	02740	508-863-6961
83	1	1	1	1	4	330578	MISS VERTIE MAE	TRAWLER MISS VERTIE MAE INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
84	1	1	1	1	4	330581	FAIR WIND	BOAT VENTURE INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
85	1	1	2	0	4	330586	WARRIOR	WARRIOR FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
86	1	1	2	0	4	330597	BEACHCOMBER	BEACHCOMBER INC	PO BOX 6426		NEWPORT NEWS	VA	23606	800-561-4168
87	1	1	2	0	4	330620	CAPTAIN LYMAN	WWJT INC	PO BOX 6426		NEWPORT NEWS	VA	23606	321-223-7200
88	1	1	2	0	4	330622	OCEAN PRINCESS	OCEAN PRINCESS, INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
89	1	1	2	0	4	330626	CAPT JEFF	BHG SCALLOP LLC	PO BOX 3321	1101 HIGHWAY 70 E	NEW BERN	NC	28564	252-637-1552
90	1	1	2	0	4	330629	OCEAN LADY	OCEAN FISHING LLC	20 BLACKMER STREET		NEW BEDFORD	MA	02744	252-636-3861
91	1	1	2	0	4	330636*	NAVIGATOR	CAROLINA GIRL III INC	PO BOX 600		SEAFORD	VA	23696	757-898-8512
92	1	1	1	1	4	330654	IAN NIGEL	IAN NIGEL INC	PO BOX 6426		NEWPORT NEWS	VA	23606	321-223-7200
93	1	1	1	1	4	330663	CRYSTAL & REBECCA	TRAWLER CRYSTAL & REBECCA INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
94	1	1	2	0	4	330668	CHIEF	CHIEFTAIN SCALLOP COMPANY	14 CANFIELD ROAD		ESSEX	CT	06426	860-767-2441
95	1	1	2	0	4	330683	CHRISTIAN & ALEXA	TRAWLER DIANNE & MAUREEN INC	98 INLET TERRACE		BELMAR	NJ	07719	732-681-4006
96	1	1	1	1	4	330687	SASSY GIRL	FULCHER ENTERPRISES INC	PO BOX 3321	1101 HIGHWAY 70 EAST	NEW BERN	NC	28564	252-514-7003
97	1	1	2	0	4	330690	STONINGTON JO	STONINGTON FISH & LOBSTER INC	PO BOX 289		STONINGTON	CT	06378	860-535-0882
98	1	1	2	0	4	330703	COURAGEOUS	COURAGEOUS FISHING CORPORATION	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
99	1	1	1	1	4	330720	KRIS & AMY	KRIS & AMY FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
100	1	1	2	0	4	330729	FISHERMANS DREAM	H & T COMMERCIAL FISHING CO	1500 DELSEA DRIVE #18		RIO GRANDE	NJ	08242	609-465-0466
101	1	1	1	1	4	330742	OCEAN PRIDE	OCEAN PRIDE INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
102	1	1	1	1	4	330749	MY GIRL	MY GIRL INC	268 INDIAN TRAIL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-465-0466
103	1	1	2	0	4	330778	ATLANTIC BOUNTY	FV ATLANTIC BOUNTY LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
104	1	1	1	1	4	330780	OCEAN GOLD	OCEAN GOLD INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
105	1	1	1	1	4	330781	FREEDOM	NEW FREEDOM FISHING CORP	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-996-3742
106	1	1	1	1	4	330782*	GARLAND CHRISTOPHER	TRAWLER GARLAND CHRISTOPHER INC	P O BOX 250		ORIENTAL	NC	28571	252-249-0123
107	1	1	1	1	4	330783	SEA QUEST	SEA QUEST INC	P O BOX 497		CAPE MAY	NJ	08204	609-884-3405
108	1	1	2	0	4	330784	U-BOYS	U-BOYS LLC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600
109	1	1	2	0	4	330786	SASSY SARAH	HIWALL INC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600

110	1	1	1	1	**4**	330788	MIZ ALMA B	TEJANO CORP	PO BOX 210		SEAFORD	VA	23696	757-898-8512
111	1	1	2	0	**4**	330791	GABRIELLE & PAIGE	GABRIELLE PAIGE CORPORATION	PO BOX 825		MONTAUK	NY	11954	631-668-5409
112	1	1	2	0	**4**	330793	CAPTAIN BILLY HAVER	CAPTAIN JUAN INC	1636 JANKE ROAD		VIRGINIA BEACH	VA	23455	757-460-2716
113	1	1	1	1	**4**	330796	HEAR NO EVIL	HEAR NO EVIL FISHING CORP	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
114	1	1	1	1	**4**	330798	PACER	OCEAN FISHING LLC	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-996-3742
115	1	1	2	0	**4**	330799	DEFIANT	FLAVIAN FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
116	1	1	2	0	**4**	330800	CHIEF & CLYDE	CHIEF SCALLOPING CORPORATION	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
117	1	1	1	1	**4**	330803	BAY STAR VI	BAY STAR VI LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	757-244-8440
118	1	1	2	0	**4**	330806	SUZEE Q	SUZEE Q LLC	74 CARRIAGE HILL DRIVE		POQUOSON	VA	23662	757-868-7405
119	1	1	2	0	**4**	330807	DICTATOR	DICTATOR INC	PO BOX 1206		SOUTHWEST HARBOR	ME	04679	207-244-5328
120	1	1	1	1	**4**	330809	CHRISTOPHER'S JOY	CHRISTOPHER JOY INC	1835 WELFORD ROAD		JACKSONVILE	FL	32207	904-254-5863
121	1	1	1	1	**4**	330811	VANTAGE	NELSON FISHING INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-479-0729
122	1	1	1	1	**4**	330816	LADY EVELYN	FV LADY EVELYN LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
123	1	1	1	1	**4**	330817	CHAZS TOY	DIAMOND SHOAL SEAFOOD INC	PO BOX 610	4146 ORCHARD CREEK RD	ORIENTAL	NC	28571	252-249-0123
124	1	1	1	1	**4**	330818	TANYA KAIT	C T SCALLOP VENTURES LLC	1065 SOUTH MAIN STREET		MAYETTA	NJ	08092	609-978-1109
125	1	1	2	0	**4**	330828	COLLIN & WARREN III	COLLIN & WARREN INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
126	1	1	1	1	**4**	330829	JANE CAROLYN	TRAWLER CAPT ALFRED INC	569 KELLY WATSON ROAD		LOWLAND	NC	28552	252-745-3751
127	1	1	2	0	**4**	330832	CRYSTAL GIRL B	CRYSTAL GIRL INC	268 INDIAN TRAIL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-465-0466
128	1	1	2	0	**4**	330845	MAKAYLA JANE	L T SCALLOP VENTURE LLC	PO BOX 727		MANAHAWKIN	NJ	08050	609-978-1109
129	1	1	2	0	**4**	330848	FISHERMANS DREAM B	FISHERMANS DREAM COMM FISHING INC	268 INDIAN TRAIL ROAD		CAPE MAY COURT HOUSE	NJ	08210	609-465-0466
130	1	1	2	0	**4**	330852	GASTONS LEGACY	FULCHER TRAWLING LLC	PO BOX 3321		NEW BERN	NC	28564	252-637-1552
131	1	1	1	1	**4**	330860	ASHTON MATTHEW	TRAWLER RICHARD HEATH, INC.	PO BOX 3321	1101 HIGHWAY 70 EAST	NEW BERN	NC	28564	252-514-7003
132	1	1	2	0	**4**	330865	JOHN & NICHOLAS	JOHN & NICHOLAS INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
133	1	1	2	0	**4**	330870	TONY TWO	TONY ONE INC	102 CLUB ROAD		SUFFOLK	VA	23435	757-593-3463
134	1	1	1	1	**4**	330871	THE CHIEF	CC SCALLOPING INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
135	1	1	1	1	**4**	330875	CAPT KENNY	NELSON SEAFOOD COMPANY LLC	P O BOX 43		HUDGINS	VA	23706	804-725-6510
136	1	1	2	0	**4**	330877	MIZ-B	BENAVIDEZ AND SONS INC	PO BOX 210		SEAFORD	VA	23696	757-898-8512
137	1	1	2	0	**4**	330884	LUCKY DANNY II	LUCKY DANNY INC	3018 CALCUTT DRIVE		MIDLOTHIAN	VA	23113	804-379-5717
138	1	1	1	1	**4**	330885	KARAH D	KARAH D INC	921 AIR STRIP ROAD		BAYBORO	NC	28515	252-745-4956
139	1	1	1	1	**4**	330886	MEKONG	RUBY'S LLC	333 JUDGES LANE		NORTH PLAINFIELD	NJ	07063	908-727-5555
140	1	1	1	1	**4**	330891	MISS CROCKETT	CHINCOTEAGUE BAY SEAFOOD INC	5430 WHITE HALL ROAD		GLOUCESTER	VA	23061	757-247-9000
141	1	1	1	1	**4**	330893	KAREN NICOLE	KAREN NICOLE INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
142	1	1	1	1	**4**	330895	PURSUIT	VIRGINIA VENTURE CORP	PO BOX 600		SEAFORD	VA	23696	757-898-8512
143	1	1	2	0	**4**	330896	MIRAGE	MIRAGE FISHING LLC	1 CAPE STREET		NEW BEDFORD	MA	02740	508-993-9505
144	1	1	1	1	**4**	330898	MASTER JAMES	FV MASTER JAMES INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
145	1	1	1	1	**4**	330899	CAPT POTTER	SIDDIE GOLDEN INC	569 KELLY WATSON RD		LOWLAND	NC	28552	252-745-3751
146	1	1	1	1	**4**	330900	LADY DEBORAH	FV LADY DEBORAH LLC	P O BOX 250	101 SOUTH AVENUE	ORIENTAL	NC	28571	252-249-0123
147	1	1	1	1	**4**	330902	RESILIENT	ONEONTA FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
148	1	1	2	0	**4**	330903	DISCOVERY II	DISCOVERY SEAFOOD INC	154 LEMON ROAD		FARMINGDALE	NJ	07727	732-267-2741
149	1	1	2	0	**4**	330906	OCEAN PROWLER	OCEAN PROWLER INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
150	1	1	2	0	**4**	410003	CAPE MAY	FV CAPE MAY LLC	PO BOX 555		CAPE MAY	NJ	08204	609-884-3000
151	1	1	2	0	**4**	410009	CONCORDIA	MICHIGAN FISHING INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	617-996-0313
152	1	1	2	0	**4**	410019	MICHIGAN	TAURUS FISHING CORP	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
153	1	1	2	0	**4**	410045	CHRISTINE & JULIE	GALLANT FISHERIES INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
154	1	1	2	0	**4**	410056	VILA NOVA DO CORVO	VILA NOVA FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
155	1	1	2	0	**4**	410068	PATIENCE	PATIENCE FISHERIES LLC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
156	1	1	1	1	**4**	410074	DONNY C	EXPEDITION FISHING CO INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
157	1	1	2	0	**4**	410080	HARVESTER	HARVESTER FISHERIES LLC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
158	1	1	2	0	**4**	410095	NASHIRA	OHARA CORPORATION	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
159	1	1	1	1	**4**	410103	ELISE G	ELISE G LLC	PO BOX 830		CAPE MAY	NJ	08204	609-884-7600
160	1	1	1	1	**4**	410127	INDEPENDENCE	T & R FISHING INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
161	1	1	2	0	**4**	410129	CHRISMAR	CHRISMAR INC	549 FOREST ROAD		CHESAPEAKE	VA	23322	757-482-3238
162	1	1	1	1	**4**	410134	LET IT RIDE	LET IT RIDE FISHING CORP	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
163	1	1	2	0	**4**	410145	KATHY ANN	KATHRYN ANN FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
164	1	1	1	1	**4**	410146	CELTIC	CELTIC FISHERIES LLC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
165	1	1	1	1	**4**	410147	BARBARA ANNE	F/V BARBARA ANNE LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
166	1	1	1	1	**4**	410150	TINA LYNN	HILL ENTERPRISES INC OF NJ	627 BREAKWATER ROAD		CAPE MAY	NJ	08204	609-884-7262
167	1	1	2	0	**4**	410151	ABIGAIL & MYLES	TRAWLER CRYSTAL & REBECCA INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022

168	1	1	2	0	**4**	410153	FRANK & MARIA	TRAWLER DIANE MARIE INC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600
169	1	1	1	1	**4**	410156	SANTA BARBARA	CHRISTINA & SANDRA FISH CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
170	1	1	1	1	**4**	410157	JANE ELIZABETH	JOHN AND JANE LLC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
171	1	1	2	0	**4**	410161	RESOLUTE	TYLER FISHING LLC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
172	1	1	1	1	**4**	410167	PATRIOTS	PATRIOTS CORP	7 CONWAY STREET		NEW BEDFORD	MA	02740	508-999-5607
173	1	1	2	0	**4**	410169	VIRGINIA WAVE	VIRGINIA WAVE INC	5430 WHITE HALL ROAD		GLOUCESTER	VA	23061	757-880-1919
174	1	1	2	0	**4**	410173	AMY MARIE	CAPE CLAM INC	P O BOX 830		CAPE MAY	NJ	08204	609-884-7600
175	1	1	2	0	**4**	410174	EDGARTOWN	NORDIC INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
176	1	1	2	0	**4**	410175	LUZITANO	THE HOPE II INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
177	1	1	1	1	**4**	410176	VIRGINIA DARE	HARBOR SEAFOOD	PO BOX 726		NEWPORT NEWS	VA	23607	757-869-4314
178	1	1	1	1	**4**	410178	SEA RANGER	BRONCO FISHERIES INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
179	1	1	1	1	**4**	410179	FRANCIS M LEE SR	SEA PRODUCTS INC	PO BOX 555		CAPE MAY	NJ	08204	609-884-3000
180	1	1	1	1	**4**	410182	VIRGINIA REEL	VIRGINIA REEL ASSOCIATES LLC	1200 KITTIWAKE COURT		VIRGINIA BEACH	VA	23451	757-422-1324
181	1	1	1	1	**4**	410184	PAUL & MICHELLE	FAIRHAVEN FISHING CORP	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
182	1	1	1	1	**4**	410185	JULIE G	W W FISHERIES LIMITED	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
183	1	1	2	0	**4**	410187	FORTUNE HUNTER	MISTY SEAS INC	PO BOX 518	RUTH DRIVE	AURORA	NC	27806	252-322-5695
184	1	1	1	1	**4**	410192	ARAHO	OHARA CORPORATION	14 HERVEY TICHON AVENUE	C/O EASTERN FISHERIES	NEW BEDFORD	MA	02740	207-594-4444
185	1	1	1	1	**4**	410193	DEFIANT	CAROLINA DREAM INC	P O BOX 600		SEAFORD	VA	23696	757-898-8512
186	1	1	1	1	**4**	410195	KATHY ROSE	MARGARET N ROSE	PO BOX 86	131 WINDMILL POINT DR	VANDEMERE	NC	28587	252-745-5338
187	1	1	2	0	**4**	410200	ANDREA JEAN	J & G SCALLOPS INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
188	1	1	1	1	**4**	410201	VAUD J	VAUD J INC	P O BOX 497		CAPE MAY	NJ	08204	609-884-3405
189	1	1	1	1	**4**	410202	JANICE LYNELL	TRAWLER YVONNE MICHELLE INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
190	1	1	1	1	**4**	410205	FOREMOST	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
191	1	1	1	1	**4**	410210	TROPICO	TROPICO FISHING INC	655 PINE HILL ROAD		WESTPORT	MA	02790	508-636-5971
192	1	1	2	0	**4**	410211	STARDUST	S J FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
193	1	1	1	1	**4**	410213	CAPT MALC	COMPANION OF WANCHESE INC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600
194	1	1	1	1	**4**	410214	AMBASSADOR	TONNESSEN FISHERIES INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	617-996-0313
195	1	1	2	0	**4**	410215	HUNTRESS	ISAKSEN FISHING CORPORATION	2 MIDDLE STREET		FAIRHAVEN	MA	02719	617-996-0313
196	1	1	1	1	**4**	410219	YVONNE MICHELLE	TRAWLER YVONNE MICHELLE INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
197	1	1	2	0	**4**	410220	ORION	ORION VENTURE LLC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-992-3334
198	1	1	1	1	**4**	410221	JUSTICE	NORDIC INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-997-5331
199	1	1	2	0	**4**	410226	ZEUS	STEPHANIE FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
200	1	1	2	0	**4**	410228	VIRGINIA QUEEN	GLOUCESTER SEAFOOD OF VA INC	5430 WHITE HALL ROAD		GLOUCESTER	VA	23061	757-880-1919
201	1	1	2	0	**4**	410229	AVENGER	AVENGER FISHING LLC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
202	1	1	2	0	**4**	410232	SUSAN L	FIVE FATHOMS INC	P O BOX 497		CAPE MAY	NJ	08204	609-884-3405
203	1	1	2	0	**4**	410235	ELIZABETH & NIKI	ELIZABETH & NIKI FISHING CORP	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
204	1	1	2	0	**4**	410236	VILA DO CONDE	VILA DO CONDE INC	19 ROSSI DRIVE		CAPE MAY	NJ	08204	609-972-6492
205	1	1	1	1	**4**	410238	STEPHANIE VAUGHN	C & I FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
206	1	1	1	1	**4**	410239	LEADER	LEADER FISHING LLC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
207	1	1	1	1	**4**	410247	FRONTIER	NORDIC FISHERIES INC	14 HARVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
208	1	1	2	0	**4**	410248	COURAGEOUS	A & E FISHERIES INC	512 SHUNPIKE ROAD		CAPE MAY	NJ	08204	609-884-5219
209	1	1	2	0	**4**	410249	WESTPORT	E & J SCALLOP CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
210	1	1	2	0	**4**	410251	AMBER NICOLE	AMBER NICOLE INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
211	1	1	1	1	**4**	410253	SETTLER	FRONTIER FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-758-4236
212	1	1	2	0	**4**	410254	EXPLORER	FAIR TRADE FISH COMPANY INC	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-996-3742
213	1	1	2	0	**4**	410255	MISS MAUDE	FAITH EVELYN INC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600
214	1	1	1	1	**4**	410261	LEGACY	ADMIRAL INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-758-3427
215	1	1	1	1	**4**	410266	ROST	NORDIC FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
216	1	1	1	1	**4**	410267	MADISON KATE	SEA VENTURES LLC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
217	1	1	2	0	**4**	410268	GENERATION	FUTURE FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
218	1	1	2	0	**4**	410269	FRIENDSHIP	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
219	1	1	1	1	**4**	410270	MARGARET ROSE	POOR BOY LLC	659 CRAWFORD ROAD		CAPE MAY	NJ	08204	609-884-9068
220	1	1	2	0	**4**	410275	APOLLO	APOLLO FISHING LLC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
221	1	1	1	1	**4**	410279	NADIA LEE	ATLANTIC SHELLFISH INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
222	1	1	1	1	**4**	410280	AMBITION	NORDIC FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
223	1	1	1	1	**4**	410281	BAY STAR II	BAY STAR II, LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	804-244-8440
224	1	1	1	1	**4**	410282	KAYLA ROSE	AJ SCALLOPING INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
225	1	1	1	1	**4**	410284	MARY ANNE	BOAT MARY ANNE INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264

226	1	1	2	0	4	410285	SILVER SEA	FV SILVER SEA LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
227	1	1	1	1	4	410288	HERITAGE	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
228	1	1	2	0	4	410289	JERSEY GIRL	FV JERSEY GIRL LLC	PO BOX 555	985 OCEAN DRIVE	CAPE MAY	NJ	08204	609-884-3000
229	1	1	1	1	4	410290	RELENTLESS	CAROLINA CLIPPER INC	P O BOX 600		SEAFORD	VA	23696	757-898-8512
230	1	1	1	1	4	410291	LITTLE SAMMIE	SAMMIE EUGENE WILLIAMS	200 MAIN STREET		SWANQUARTER	NC	27885	252-926-1851
231	1	1	2	0	4	410292	NELSON	NELSON FISHING INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
232	1	1	2	0	4	410293	FEARLESS	S & F FISHING INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
233	1	1	2	0	4	410300	LINDA	L V FISHING INC	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-996-3742
234	1	1	1	1	4	410309	BOUNTIFUL II	ISAKSEN FISHING CORPORATION	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
235	1	1	1	1	4	410315	DIVINE MERCY	DIVINE MERCY LLC	97 KEEL ROAD		GRANTSBORO	NC	28529	252-745-7243
236	1	1	1	1	4	410320	SAGA	COVE FISHING CORP	20 BLACKMER STREET		NEW BEDFORD	MA	02740	508-996-3742
237	1	1	1	1	4	410323	ENDURANCE	SAI FISHERIES INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-993-0235
238	1	1	1	1	4	410326	KAREN ELIZABETH	SALT POND FISHERIES INC	81 POINT AVENUE		WAKEFIELD	RI	02879	401-741-1831
239	1	1	1	1	4	410337	MISS STEVIE B	MISS STEVIE B CORP	202 SCOTCH TOM WAY		GRAFTON	VA	23692	757-898-8512
240	1	1	2	0	4	410338	THOR	THOR FISHING CORPORATION	74 GREEN STREET		FAIRHAVEN	MA	02719	508-993-5342
241	1	1	2	0	4	410341	ACT III	BALD INC	305 DELANO ROAD		MARION	MA	02738	508-748-2827
242	1	1	2	0	4	410343	EILEEN MARIE	EILEEN MARIE FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
243	1	1	2	0	4	410346	CORSAIR	CORSAIR FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-509-8100
244	1	1	1	1	4	410347	JANICE JULIE	W G FISHERIES INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
245	1	1	1	1	4	410353	BAY STAR III	BAY STAR III LLC	800 TERMINAL AVENUE		NEWPORT NEWS	VA	23607	757-244-8440
246	1	1	1	1	4	410363	LADY OF FATIMA	CAPT SANTOS FISHING CORPORATION	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
247	1	1	1	1	4	410364	ITALIAN PRINCESS	ITALIAN PRINCESS INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
248	1	1	2	0	4	410366	ACT IV	NORPORT INC	305 DELANO ROAD		MARION	MA	02738	508-748-2827
249	1	1	2	0	4	410371	NANCY ELIZABETH	NANCY ELIZABETH LLC	PO BOX 930		CAPE MAY	NJ	08204	609-884-7600
250	1	1	2	0	4	410384	THUNDER BAY	FV ADRIANNA LLC	985 OCEAN DRIVE	PO BOX 555	CAPE MAY	NJ	08204	609-884-3000
251	1	1	2	0	4	410386	INCENTIVE	INCENTIVE FISHERIES LLC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
252	1	1	2	0	4	410390	MONOMOY	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
253	1	1	2	0	4	410392	MAJESTIC	F/V MAJESTIC INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
254	1	1	1	1	4	410393	NORTH QUEEN	NORTH QUEEN FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
255	1	1	2	0	4	410394	CONTENDER	MICHIGAN FISHING CORP	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
256	1	1	2	0	4	410413	LIBERTY	NORDIC INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
257	1	1	1	1	4	410414	DETERMINATION	F/V DETERMINATION INC	607 SEASHORE ROAD		CAPE MAY	NJ	08204	609-884-1771
258	1	1	1	1	4	410415	HUNTER	HUNTER SCALLOPING COMPANY LLC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
259	1	1	2	0	4	410416	NORDIC PRIDE	NORDIC FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
260	1	1	1	1	4	410417	ATLANTIC	KAVANAGH FISHERIES INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
261	1	1	1	1	4	410419	BRITTANY ERYN	BLUE SEAS VENTURES LLC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
262	1	1	2	0	4	410420	DILIGENCE	DILIGENCE INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
263	1	1	2	0	4	410422	TRADITION	FUTURE FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
264	1	1	1	1	4	410423	NORSEMAN	FUTURE FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
265	1	1	2	0	4	410430	SANDRA JANE	J & M FISHING INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
266	1	1	1	1	4	410432	ENDEAVOR	HANSEN SCALLOPING INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
267	1	1	1	1	4	410441	CAROLINA BOY	CAROLINA BOY INC	P O BOX 600		SEAFORD	VA	23696	757-898-8512
268	1	1	2	0	4	410444	TYLER N NOAH	S & S FISHING LLC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
269	1	1	1	1	4	410451	VILA NOVA DO CORVO II	VILA NOVA DO CORVO II INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
270	1	1	2	0	4	410455	PATTY JO	STONINGTON FISH & LOBSTER INC	PO BOX 289		STONINGTON	CT	06378	860-535-0882
271	1	1	1	1	4	410456	PAMELA ANN	STAR LLC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
272	1	1	1	1	4	410459	SANTA MARIA	SANTA MARIA FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-997-2197
273	1	1	2	0	4	410463	BETH ANNE	BETH ANNE FISHING INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
274	1	1	2	0	4	410476	ITALIAN PRINCESS	ITALIAN PRINCESS INC	PO BOX 600		SEAFORD	VA	23696	757-898-8512
275	1	1	2	0	4	410489	VENTURE	NORDIC INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
276	1	1	1	1	4	410493	SANTA ISABEL	SANTA ISABEL FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-997-2197
277	1	1	1	1	4	410494	DECISIVE	FUTURE FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
278	1	1	2	0	4	410496	KATHY MARIE	ARNIES FISHERIES INC	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
279	1	1	2	0	4	410499	KATHY & JACKIE	KATHY & JACKIE FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
280	1	1	2	0	4	410505	KATHY ANN	KATHY ANN CORP	PO BOX 772	1801 BAYVIEW AVE	BARNEGAT LIGHT	NJ	08006	609-548-5020
281	1	1	2	0	4	410507	GUIDANCE	GUIDANCE FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
282	1	1	1	1	4	410508	LAUREN & MATTHEW	TRAWLER MISS VERTIE MAE INC	PO BOX 553		NEWPORT NEWS	VA	23607	757-245-3022
283	1	1	2	0	4	410514	YANKEE PRIDE	YANKEE PRIDE FISHERIES INC	81 POINT AVENUE		WAKEFIELD	RI	02879	401-741-1831

284	1	1	1	1	**4**	410519	ACORES	IVONILDE FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
285	1	1	1	1	**4**	410541	DIANE MARIE	SEA ROVER FISHING INC	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
286	1	1	1	1	**4**	410547	REGULUS	EMPIRE FISHERIES LLC	322 NEW HAVEN AVENUE		MILFORD	CT	06460	203-876-8923
287	1	1	1	1	**4**	410550	FJORD	FUTURE FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
288	1	1	1	1	**4**	410551	RANGER	OHARA CORPORATION	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
289	1	1	2	0	**4**	410552	RAIDERS	RAIDERS CORP	7 CONWAY STREET		NEW BEDFORD	MA	02740	508-999-5607
290	1	1	2	0	**4**	410553	RESOLUTION	CONSTELLATION FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
291	1	1	1	1	**4**	410554	K A T E	COMPASS FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
292	1	1	2	0	**4**	410556	QUEEN OF PEACE	SANTOS FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
293	1	1	2	0	**4**	410558	QUINCY II	QUINCY FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-672-6052
294	1	1	1	1	**4**	410561	K A T E II	COMPASS FISHING CORP	113 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-996-0525
295	1	1	1	1	**4**	410564	ILHA BRAVA	C & C FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
296	1	1	1	1	**4**	410571	EVERGREEN	MAR-LI-MAR INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0313
297	1	1	2	0	**4**	410572	NESKONE	NORDIC FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
298	1	1	2	0	**4**	410575	INSPIRATION	AARSHEIM FISHING CORP	305 DELANO ROAD		MARION	MA	02738	508-748-2827
299	1	1	1	1	**4**	410578	MISS GEORGIE	MISS GEORGIE INC	552 ROWE ROAD		AURORA	NC	27806	252-670-1176
300	1	1	2	0	**4**	410579	CAPT GASTON	LEGACY TRAWLING INC	PO BOX 3321		NEW BERN	NC	28564	252-637-1552
301	1	1	1	1	**4**	410586	SHARON K	KENPAC FISHING CORP	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
302	1	1	2	0	**4**	410590	VILA NOVA DO CORVO I	VILA FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334
303	1	1	1	1	**4**	410592	ELIZABETH AMBER	ACM SCALLOP CORPORATION	323 TRINDALLS COURT		SUFFOLK	VA	23436	757-870-9473
304	1	1	2	0	**4**	410593	GOOD NEWS II	DELORES OF WANCHESE INC	48 WATER STREET		HAMPTON	VA	23663	757-728-0600
305	1	1	2	0	**4**	410595	POLARIS	OHARA CORPORATION	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-6730
306	1	1	2	0	**4**	410596	ZIBET	ZIBET INC	2 MIDDLE STREET		FAIRHAVEN	MA	02719	508-996-0331
307	1	1	2	0	**4**	410597	GEORGES BANKS	G & J FISHERIES INC	114 MACARTHUR DRIVE		NEW BEDFORD	MA	02740	508-994-4264
308	1	1	2	0	**4**	410598	CRYSTAL AND KATIE	KATIE & CRYSTAL LLC	74 CARRIAGE HILL DRIVE		POQUOSON	VA	23662	804-868-7405
309	1	1	1	1	**4**	410599	WISDOM	FUTURE FISHERIES INC	14 HARVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
310	1	1	2	0	**4**	410600	ALASKA	INVINCIBLE FISHING CORPORATION	20 BLACKMER STREET		NEW BEDFORD	MA	02744	508-996-3742
311	1	1	2	0	**4**	410601	HORIZON	NORDIC FISHERIES INC	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
312	1	1	2	0	**4**	410603	ARCTURUS	OHARA CORPORATION	14 HERVEY TICHON AVENUE		NEW BEDFORD	MA	02740	508-993-5300
313	1	1	1	1	**4**	410604	ATHENA	ATHENA FISHING CORP	84 FRONT STREET		NEW BEDFORD	MA	02740	508-992-3334

** Indicates a permit number currently not assigned to a vessel (i.e., CPH)*

Note: These proposed trip assignments are based on permit data from January 2011 and are dependent upon permit renewals for the 2011 fishing year. Should NFMS approve Framework 22, these allocation assignments will be updated prior to implementation to reflect any vessel replacements or ownership changes that may occur. Any adjustments to this information will be made publically available.

- ***Method for 2012 and other years that have more than two split trips***

For 2012, the proposed action includes one spit trip to CA1, one split trip for NL, one split trip for HC and one split trip for Delmarva, meaning half the fleet gets an allocation into all four areas. Those four split trips total to 2 trips for each vessel. In addition to these trips, each vessel will receive 1 trip to CA2 and 1 trip to HC. If the random lottery method above is applied for 2012 it is possible for one vessel to get a total of six trips: the two trips all vessels get (HC and CA2) as well as a trip from each of the split trips if it is done completely randomly (See Vessel 10 as an example in Table 11). Therefore, the random lottery above is modified in order to avoid some vessels from getting more than 4 trips and some getting less as a result of independent random lotteries to each area. Instead, another method was developed to randomly assign 2 trips from the 4 split trips to access areas included in the set (CA1, NL, HC, Delmarva (DEL))in such a way that: 1) no vessel will receive more than 1 trip from any area with a split trip allocation (excluding HC because all vessels get one trip from that area); and 2) no vessel will receive more than 4 access area trips in total, including the HC and CA2 allocation that all vessels get. A subset of PDT members developed the method below so that NMFS can generate a random lottery of this nature in 2012 and beyond if needed. The following steps explain how this system of lottery works.

1. Using Excel, a spreadsheet with the list of permit numbers is created, and then a random number generator is added next to each permit number. Include another column for each of the access areas and fill this column starting with “1” in the 1st row (the row following the title of the column), and “0” in the 2nd row, “1” in the 3rd row, “0” in the fourth row and on in the same order until all the rows are filled corresponding to the 313 full-time vessels. The number “1” would indicate 1 trip and “0” would indicate no trip would be assigned to the corresponding area. The excel spreadsheet will look like the following with the fictional permit numbers (Per). The actual spreadsheet for lottery also includes actual permit numbers of the vessels after the Per. Column. The numbers in the RAND columns are random numbers obtained by the random generator formula in excel.

Table 10. First Step of modified random lottery allocation

Per.	RAND-1	CA1	Per.	RAND-2	NL	Per.	RAND-3	HC	Per.	RAND-4	DEL
1	0.019722	1	1	0.990481	1	1	0.914224	1	1	0.371094	1
2	0.191203	0	2	0.231624	0	2	0.581873	0	2	0.358431	0
3	0.505543	1	3	0.125804	1	3	0.848646	1	3	0.248101	1
4	0.216169	0	4	0.388077	0	4	0.594867	0	4	0.258092	0
5	0.351419	1	5	0.955476	1	5	0.960518	1	5	0.676188	1
6	0.100617	0	6	0.750356	0	6	0.265801	0	6	0.367506	0
7	0.891925	1	7	0.841939	1	7	0.319413	1	7	0.108255	1
8	0.619415	0	8	0.547469	0	8	0.218248	0	8	0.33417	0
9	0.917465	1	9	0.711995	1	9	0.011344	1	9	0.131703	1
10	0.717283	0	10	0.141587	0	10	0.121895	0	10	0.484205	0
11	0.988099	1	11	0.71864	1	11	0.236677	1	11	0.177684	1

Per=Fictional permit numbers starting with 1.

2. Iteration 1: Copy and paste the values from the spreadsheet shown above in a new spreadsheet. Random sort the CA1 by Random column1 (RAND1), NL by random column2 (RAND-2) and so on. Calculate the total number of trips in the last column. First iteration may look like the following:

Table 11. First iteration of modified random lottery allocation

Per.	CA1	Per.	NL	Per.	HC	Per.	DEL	Total trips
1	1	1	0	1	0	1	0	1
2	1	2	1	2	0	2	1	3
3	0	3	0	3	1	3	0	1
4	0	4	0	4	0	4	1	1
5	0	5	1	5	1	5	0	2
6	0	6	1	6	0	6	0	1
7	0	7	1	7	0	7	1	2
8	1	8	1	8	0	8	0	2
9	0	9	1	9	1	9	1	3
10	1	10	1	10	1	10	1	4
11	1	11	0	11	0	11	0	1

In this step, vessels 5, 7 and 8 got exactly 2 full trips from 2 of the 4 access areas. For example, vessel 5 received 1 trip for NL and 1 trip to HC but no trips to CA1 and Delmarva. In addition, to these trips, all vessels, including vessel 5 will receive 1 full trip to CA2 and 1 full trip to HC. Including those trips, vessel A would get a total of 4 access area trips, 1 to CA2, 1 to NL and 2 trips to HC. This fulfills the objectives of the method; that all vessels will receive 2 full trips out of the 4 split trips to access areas, totaling 4 full-trips including the additional one trip each to CA2 and HC. Same is true for vessels 7 and 8. Thus, these vessels will be removed from the next iteration.

3. Iterations 2+: Next iteration would include all vessels except those that received a total of 2 trips in the first iteration. The same steps explained for iteration 1 will be applied in this step: Copy and paste values from the first iteration (except the total column) in a new spreadsheet --except for those vessels that received 2 full trips out of the 4 split trips. The Random sort the CA1 by Random column1 (RAND1), NL by random column2 (RAND-2) and so on. Calculate the total number of trips in the last column. If every vessel received 2 full trips out of 4 split trips, then stop the iteration. If not do another iteration with the subset of vessels that received 0, 1, 3 or 4 trips from these areas.

4. Final iteration: There will be no more iterations once all the vessels received exactly 2 full trips out of 4 split trips form the 4 access areas of CA1, NL, HC and Delmarva. With this method every vessel would get 4 full trips including the additional trips to CA2 and HC. Some vessels could end up with 2 HC Canyon trips and 2 additional trips from 2 other areas, but no vessel would receive more than 1 trip in each of the CA1, NL, and Delmarva areas.

2.4.3 Additional background about specifications based on Amendment 15 proposed measures

Since this is the first action to follow Amendment 15 this section has been included to help clarify the new ACL structure as proposed under Amendment 15. There are no alternatives in this action relative to this topic; this summary has been provided to clarify where the specific allocations have come from based on the decisions made in Amendment 15 related to sub-ACLs etc. All information in this section is based on the proposed action, Alternative 1, to illustrate how those allocations relate to the various sub-ACLs etc. proposed under Amendment 15.

Based on Council decisions in Amendment 15, OFL is equivalent to F = 0.38, the ABC and ACL are equivalent to F = 0.32. Before projections are run, 1% of the ABC is set aside for the observer set-aside program, 1.25 million pounds are set aside for the research set-aside program, and 5.5% of the ABC is allocated to the LAGC IFQ fishery (5% to the IFQ fleet; 0.5% to limited access vessels that also have IFQ permits. The LAGC IFQ fishery allocation (i.e., the LAGC sub-ACT)is taken directly from the ABC because in Amendment 15 the Council recommended that there be no buffer for management uncertainty for this fishery (i.e., the LAGC sub-ACT equals the LAGC sub-ACL, which equals 5.5% of the ABC, after accounting for set-asides and the incidental TAC). Therefore, under all three alternatives considered the allocations from observer set-aside, research set-asides and the general category allocation are the same.

Once the set-asides and LAGC allocation are taken out, all three alternatives for limited access scallop vessels would be set at an overall *F* of 0.28 – the *F* rate associated with 25% chance of exceeding ABC. Because there is management uncertainty associated with DAS management and other issues such as carryover DAS and vessel upgrading, a buffer of about 14% for this particular action is the management uncertainty associated with setting a target *F*, or ACT, at the *F* rate with a 25% chance of exceeding ABC.

Figure 3 is the ACL approach adopted by the Council in Amendment 15. Assuming this approach is approved, Figure 3 reflects the various allocations related to Alternative 1 for 2011 as an example. Table 12 summarizes the ACL related values for this framework including OFL, ABC, various ACLs, and ACTs.

Table 12 - ACL related values and allocations for 2011 and 2012, rounded from ABCs approved by SSC

	2011	2012	2013*
OFL	71,400,000	75,800,000	75,136,308
ABC	60,100,000	63,800,000	63,272,680
incidental	50,000	50,000	50,000
RSA	1,250,000	1,250,000	1,250,000
OBS	601,000	638,000	632,727
ACL after set-asides/incidental removed *(= ABC-(incidental + RSA +OBS))*	58,199,000	61,862,000	61,339,953
LA sub-ACL (94.5% of ACL)	54,998,055	58,459,590	57,966,256
IFQ-only (5% of ACL)= sub-ACL = ACT	2,909,950	3,093,100	3,066,998
IFQ + LA (0.5% of ACL)=sub-ACL=ACT	290,995	309,310	306,700
LA sub-ACT (after management buffer applied)	*Varies based on alternative*	*Varies based on alternative*	*Varies based on alternative*

After Amendment 15 is adopted, if the LAGC or LA scallop fisheries exceed their sub-ACLs, accountability measures will be triggered. For the proposed action, the LA sub-ACT is 47.2 million pounds compared to the LA sub-ACL of 55.0 million pounds. That 7.8 million pound difference represented a buffer for management uncertainty. The PDT has made some important adjustments to the models used to estimate future catch and fishing mortality, primarily updating estimates of LPUE in open areas. Thus actual landings are expected to be closer to projected landings, but there are still other sources of uncertainty. First, the carry over of 10 DAS is still allowed in this fishery, so almost a third of all open area DAS allocated each year can be carried forward. In addition, all limited access vessels can upgrade their permit once, and are allowed to replace their vessel within the same vessel replacement criteria. Approximately 2/3rds of the current limited access vessels can still upgrade their vessels, which could increase catch in open areas. Also, some compensation trips for access area trips broken in a given fishing year can be taken within the first 60 days that an access area is open in a subsequent year and the scallop landings from those trips apply to the fishing year when it was landed (e.g., a FY 2010 comp trip taken in FY 2011 will apply to the 2011 catch). Lastly, because access areas are allocated in full integer trips, catch can exceed or fall below projected values.

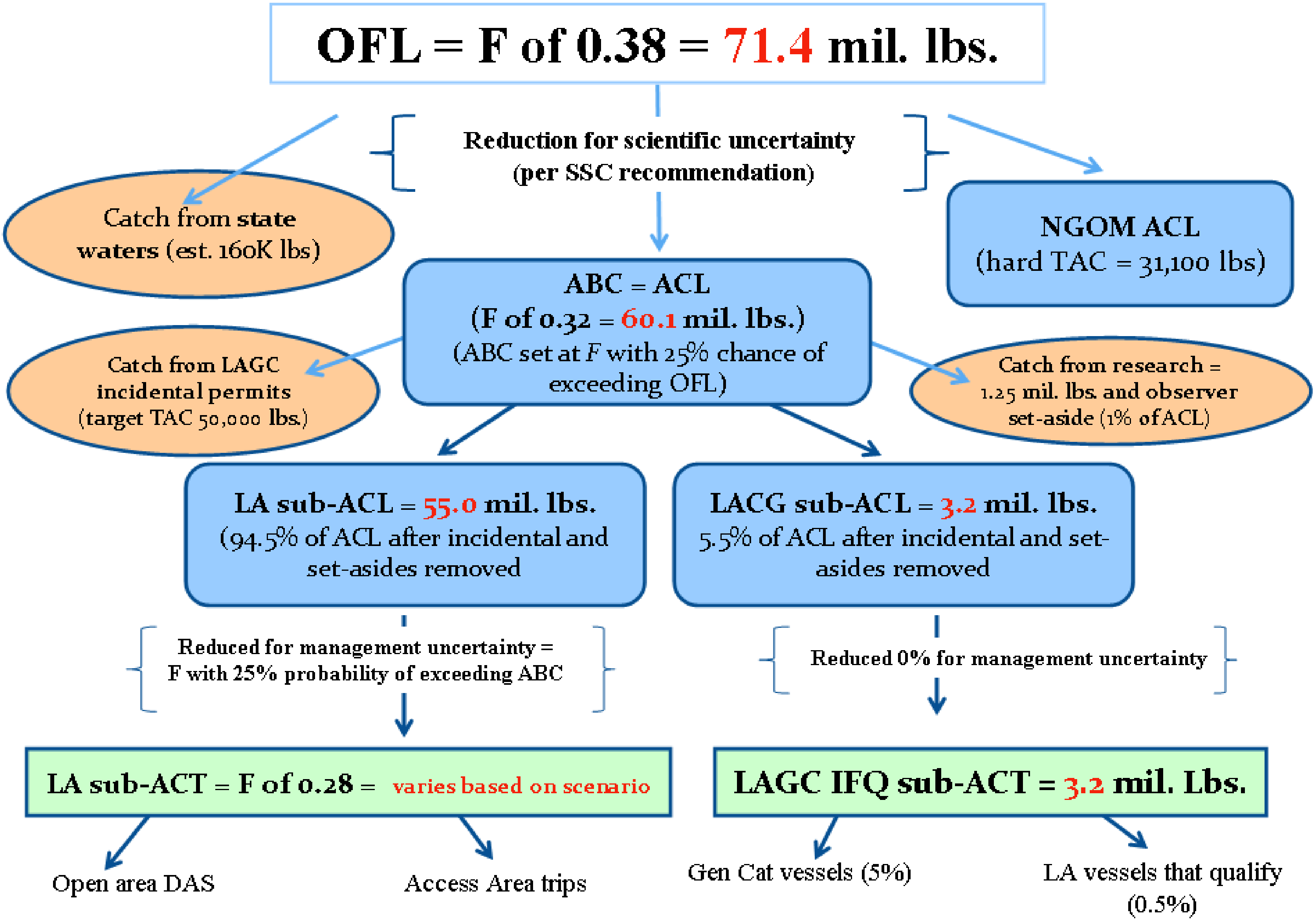
For example, the model projection for the proposed action estimates that 3.8 trips are available under the proposed action for FY2011. But the final alternative includes 4, since those allocations are rounded up or down. Therefore, the estimate of catch in the projection is based on 3.8 trips, but actual catch based on an allocation of 4 trips will likely exceed that amount. This rounding seems like a minor issue, and it has been adequately addressed by providing a buffer between the LA sub-ACL and LA sub-ACTs, but it is an additional cause of differences between projected and actual catch. Specifically in 2011 the model estimates that 21.7 million pounds will be landed under the time averaged F overfishing definition in the access areas. However, the estimated catch based on what will be allocated to the fishery is 23.5 million pounds (18,000 lb/trip * 327 FTE's * 4 trips), a 1.9 million pound difference. Similarly, general category allocations are higher as well because those allocations are based on 5.5% of the access area catch, using an allocation of four full access area trips. For this fleet the same example in 2011 would allocate about 100,000 pounds (172 trips) more catch to the LAGC fishery, based on four full trip allocations compared to 3.68.

Every allocated pound is not expected to be caught from the access areas, but if it is, the target catch will be exceeded by 1.9 million pounds for the limited access fishery from this source of management uncertainty alone. This fact is important to keep in mind when comparing projected and actual catch after a framework is implemented. If a target is exceeded it is not just because models were incorrect or catch rates were higher than expected, simple rounding of access area allocations is another source of uncertainty in catch. So long as there is a sufficient buffer between the limited access sub-ACL and sub-ACT, these sources of uncertainty should not cause accountability measures to be triggered. These sources of uncertainty impact whether projected catch is exceeded, but that is not what drives whether AMs are triggered.

Table 13 – Example of one source of management uncertainty that impacts actual versus projected catch

Area	Model estimate of LA AA catch	Model estimate of LA trips	#trips	LA FTE	pos.lim	LA TAC
HC	5,358,276	0.91	1	327	18000	5,886,000
DMV	5,264,025	0.89	1	327	18000	5,886,000
CAI	8,191,825	1.39	1.5	327	18000	8,829,000
CAII	2,845,387	0.48	0.5	327	18000	2,943,000
Total AA	**21,659,513**	**3.68**	**4**			**23,544,000**
						(+1,884,487)

Figure 3 – Summary of allocations for the scallop fishery under Framework 22 (2011) based on ACL structure approved in Amendment 15



In addition to the three specific alternatives considered for FW22 this action will analyze the No Action alternative as well as a status quo alternative. No Action is described in detail in Section 2.4.1.1. For this action Status quo is equivalent to 2010 measures since No Action is actually not the same as 2010 allocations because of the way the access area program is implemented. Specifically, the main difference between No Action and Status Quo is that under No Action trips need to be allocated to specific areas that are scheduled to be open, but there is not sufficient biomass in those areas, so estimated catch from those trips is limited to the biomass available. For example, instead of roughly 6 million pounds being landed from one ETA trip, only 2.5 million pounds are expected because that area does not have enough biomass to support a full trip. In addition, in 2012 only three access area trips are allocated under No Action compared to four that are allocated under each of the alternatives considered in FW22.

Status Quo or 2010 allocations, is a alternative that is not a viable alternative on the table but has been analyzed to show the impacts of allocating 2010 measures in 2011 and 2012. This alternative includes 38 days and 4 access trips for both years to show short-term and long-term consequences of SQ allocations. If allocations were the same for both years fishing mortality rates would be higher than the ones considered in this action. This alternative has been included in the analyses because when the proposed alternatives (Alternatives 1, 2, and 3) are compared to no action, they will look artificially better since No Action is actually lower than 2010 allocations (status quo) because it is constrained by available biomass and only three trips are allocated in 2012. Comparing the impacts of Status quo to the proposed alternatives will reflect the impacts of FW22 compared to 2010 conditions when the allocations are kept at the same levels. The Magnuson Act requires that alternatives be compared to No Action, so this document will do that primarily. But it will also compare the results of the three alternatives to status quo to provide additional information about impacts compared to the most recent fishing year, 2010.

It should be noted that Amendment 15 also included a measure to set specifications for three years rather than two. This was selected as a measure to address the fact that scallop specifications are implemented after the start of the fishing year so that more recent resource survey results can be incorporated. Therefore, specifications will be set for the third year as a default, and will be replaced with measures set in the next framework. But they will be there to rollover if a framework is late, rather than the previous year, as it works currently. This action is also considering an alternative to remove the access area schedule in the regulations for Georges Bank, Alternative 2.13. Having a specific schedule set in the regulations has complicated matters when an action is implemented late. Now third year specifications will be identified in a framework and will be in place until replaced by a subsequent action; therefore, the need for a default schedule is not necessary.

2.4.4 Specifications for 2013

During development of this action it became clear that the fishgig year was most likely not going to be changed under Amendment 15 from March 1 to May 1 to address timing issues that cause framework actins to be implemented late after the start of the fishing year. Instead, and alternative was considered and selected in Amendment 15 to add a third year to each specification package as a default year that would be in place before a subsequent action rather than rollover measures from the year before. These measures will ultimately be replaced by a subsequent action. This section describes the default measures for 2013 under the proposed action only. There is no No Action alternative associated with this measure, this is an additional part of the specifications described related to Alternative 1 – the proposed action.

The projections for Alternative 1 suggest that specifications for 2013 should be 4 access area trips and 35 open area DAS (Table 14). ACL related values for this fishing year are presented in Table 15, but are expected to change in future actions when final specifications are set for FY2013 and 2014. When the Committee reviewed the default allocations for 2013, they suggested that DAS should be 75% of the projection to be precautionary, and the Council agreed. Estimates are less certain the further out they are and it is easier to allocate more DAS in the subsequent framework that will be implemented after the fishing year starts, compared to taking DAS away. The DAS allocation for this default year is not expected to be the final allocation for FY2013, but in the event that Framework 24 is delayed and measures are not in place at the beginning of FY2013, these measures will serve as a default. Setting 2013 measures as a default to be replaced with updated measures is superior to FY2012 measures rolling over in terms of potential impacts on the resource and administrative burdens associated with late implementation of frameworks.

Table 14 – Summary of 2013 allocations suggested by the Committee for Alternative 1. The original projection included 35 open area DAS

	CA1	CA2	NL	HC	DMV	ET	Total	Channel	OA DAS
2013	-	1	1	1.5	0.5	-	4	open	26

Table 15 - ACL related values and allocations for 2013

	2013*
OFL	75,136,308
ABC	63,272,680
incidental	50,000
RSA	1,250,000
OBS	632,727
ACL after set-asides/incidental removed *(= ABC-(incidental + RSA +OBS))*	61,339,953
LA sub-ACL (94.5% of ACL)	57,966,256
IFQ-only (5% of ACL)= sub-ACL = ACT	3,066,998
IFQ + LA (0.5% of ACL)=sub-ACL=ACT	306,700
LA sub-ACT (after management buffer applied)	*Varies based on alternative*

** 2013 measures are default and expected to be adjusted in future action*

2.5 ADDITIONAL BACKGROUND ABOUT SPECIFIC MEASURES FOR LIMITED ACCESS VESSELS RELATED TO ALLOCATION ALTERNATIVE SELECTED

Under current regulations (CFR §648.60), limited access vessels are authorized to take a certain amount of trips to each controlled access area during a fishing year. Each full-time vessel has been authorized to land 18,000 pounds of scallop meat per trip (40% of that for part-time vessels and 8.33% for occasional vessels). Fishing in controlled access areas may be subject to other limits such as seasons or potential closures due to TACs for yellowtail flounder. The maximum number of trips per area will be considered in this action for FY2011 and FY2012 to prevent overfishing and optimize yield. Access areas include areas within the Multispecies closed areas (Closed Area I, Closed Area II, and Nantucket Lightship), as well as areas specifically closed as scallop rotational closed areas (Hudson Canyon, Elephant Trunk, and Delmarva) (See Figure 1 and Figure 2).

Limited access vessels are also allocated a specific number of open area DAS in biennial frameworks to achieve optimum yield at the current target fishing mortality of 0.28 for the total scallop resource. The open area DAS allocations depend on what controlled access areas are available and the number of trips the Council recommends to allocate per area, as well as allocations made to the general category fishery. The open area allocations are also based on the assumption that a part-time vessel receives 40% of a full-time allocation, and an occasional vessel receives 8.33% of a full-time vessel.

Alternative 1 is the proposed action for this framework. Based on these allocations limited access vessels are also granted open area DAS compensation if an access area on GB closes due to the YT bycatch cap being reached. The process for this adjustment is part of existing regulations, specification packages only have to set the amount in terms of DAS compensation; therefore, there are no alternatives for this measure, it is simply a straight calculation from LPUE estimated of open areas. Section 2.5.1 describes the calculation in more detail, but this is not a separate measure, it is part of the proposed allocation alternative.

Included in this section is also a summary of the recent accountability measures proposed in Amendment 15 relative to YT flounder (Section 2.5.2). Similarly, this section does not include alternatives; it has been included in this action as background since it is the first specification package following Amendment 15. It has been included in this action to review what measures could be in effect if a YT flounder sub-ACL is exceeded and AMs are triggered.

2.5.1 Adjustments when yellowtail flounder catches reach TAC in GB access areas (based on 10% allocation limit)

If the 10% yellowtail flounder (YT) bycatch TAC is reached and the Georges Bank access areas close, additional open area DAS are allocated for each trip not taken before the area closes, but at a prorated value of DAS. The prorated amount is calculated to achieve an equal amount of scallop mortality per DAS. This calculation takes into account the expected average landings per DAS based on relative biomass and scallop size in the open areas, compared to the GB access areas. The PDT did look into an idea that would provide compensation in other access areas instead of open areas, but it was determined that it would be too complicated to develop in the time allotted for this action. The PDT would have to identify how many trips could be taken in other areas upfront and would have to develop a process for how that would be administered in terms of which vessels get to fish in which areas, etc.

In 2011 the GB YT sub-ACL for the scallop fishery is 201 mt and 307 mt for 2012. This is a stock-wide sub-ACL. The scallop fishery is also subject to a maximum of YT in GB access areas, equivalent to 10% of the total YT TAC. The TACs for GB access areas is 104.5 mt for both 2011 and 2012. FY2012 could change based on results of the TRAC process, which is not final until fall 2011. For the NL access area, the scallop fishery is subject to a maximum of YT equivalent to 10% of the total SNE/MA YT ACL. In 2011, the YT TAC for NL is 64.1 mt and 93.6 mt for 2012. These are caps set in existing regulations equivalent to 10% of the total YT TAC. It should be noted that NL is not open in 2011, so the only YT TAC that will be monitored with potential impacts on the scallop fishery in 2011 is the SNE/MA stockwide YT sub-ACL.

In order to calculate the compensation that will be used for limited access trips that have not been taken if the YT bycatch TAC is reached in an access area, an estimate is made about the number of days in the open areas required to remove the same number of scallops that would have been taken in the closed areas. For example, in Closed Area 1, a full trip is 18,000 lbs, and according to the projections for the Alternative 1 alternative, the average meat count in Closed Area I is estimated to be 10.6 meats per pound, implying that 18,000*10.6 = 190,800 scallops will be removed per trip. In the open areas, the average meat count is estimated to be 18.4 so that 190,800 scallops correspond to 190,800/10.6 = 10,370 pounds. The estimate of open area LPUE generated from the model for this alternative is 2441, so it will take 10370/2441 = 4.25 DAS to land the same number of scallops, resulting in compensation of 4.25 DAS. Similar values for CA2 for 2011 and 2012, as well as NL in 2012 have been generated the same way and are summarized in the table below (Table 16).

For 2011, the proposed action includes an allocation of 4.3 DAS as compensation if Closed Area 1 closes; and 5.7 DAS if Closed Area II closes. For 2012, the open area DAS compensation for Closed Area I is 4.4 DAS, 5.4 DAS for CAII, and 4.3 DAS for Nantucket Lightship. Allocations for 2013 are provided below as well, but those values are expected to change when specifications are updated for that fishing year (Table 16).

Table 16 – Open area DAS compensations for unused GB access area trips under the proposed action

	CA1	CA2	NLS
2011	4.3	5.7	N/A
2012	4.4	5.4	4.3
2013*	N/A	5.4	4.9

** Subject to change - expected to be replaced with FW24 measures*

2.5.2 Review of yellowtail flounder accountability measures

In Amendment 15, the Council approved accountability measures for the GB and SNE yellowtail flounder sub-ACLs that were allocated to the scallop fishery. If approved, the accountability measures adopted under Amendment 15 will apply in 2011 and beyond. This framework does not include any changes to those measures. If an ACL is exceeded during the 2011 fishing year, AMs will be triggered for FY2012, based on what is approved in Amendment 15, same for 2012 and 2013. There are no alternatives under consideration in FW22 for this topic; this section has been included to help clarify what the YT sub-ACL values are in the coming years based on decisions in Multispecies Framework 45, as well as a review of the accountability measures that will be in effect if a sub-ACL is exceeded, as proposed under Amendment 15.

The AM adopted by the Council includes a seasonal closure of a portion of the YT stock area pre-identified as having high bycatch, with the LAGC fishery exempted. Section 3.2.3.11.2 of Amendment 15 describes in detail the alternative that was selected. In general, pre-defined areas will close on March 1 in the subsequent year until a time determined by the PDT to account for the overage.

Framework 44 to the Multispecies FMP allocated the YT-sub ACL amounts to the scallop fishery for 2010 through 2012 (Table 17). During development of Framework 45 to the Multispecies FPM and this action, the Council considered whether these allocations should change based on new resource information, and updated bycatch rates and scallop projections for Framework 22 (Table 18). The Council reviewed the updated estimates of YT catch in the scallop fishery under FW22 alternatives, and decided not to adjust the allocations set in Framework 44. Therefore, the allocations in Table 17 are still in effect for 2011 and 2012. If the scallop fishery exceeds these allocations, AMs will be triggered for the subsequent fishing year. In all cases except one the scallop fishery is estimated to catch less YT than has been allocated. However, in 2012 on GB the fishery is estimated to catch 341.8 mt and the sub-ACL that year for that stock is 307 mt, so the risk of exceeding the sub-ACL may be higher in that area and year based on the current estimates. At the final framework meeting, the Council clarified that this AM in particular can be adjusted in the future when more data are available to make the seasonal closures as small and real time as possible. This was identified as a priority issue to consider in Framework 23 to the Scallop FMP.

Table 17 - YT sub-components (2010) and ACLs (2011 and 2012) allocated to the scallop fishery 2010-2012 (in mt) as specified in Multispecies Framework 44, and maintained in Framework 45

	2010	2011	2012	2013
GB	146	201	307	Will be set in subsequent GF action
SNEMA	135	82	127	

Table 18 – Estimated YT catch for the scallop fishery under the proposed action, Alt. 1 (mt)

	2011	2012	2013
GB	175.3	341.8	404.0
SNE/MA	57.6	83.7	134.0

2.6 SPECIFIC MEASURES FOR GENERAL CATEGORY VESSELS

2.6.1 No Action for limited access general category (LAGC) IFQ allocations

Under No Action, the TAC for IFQ-only vessels would be 1,055 mt (2.3 M lb); the TAC for full-time, part-time, and occasional vessels with IFQ would be 106 mt (232,671 lb; applied to IFQ permit). LAGC IFQ vessels in FYs 2011 and 2012 would be allocated 714 fleet-wide trips in both the NLA and DMV, as well as 1,377 fleet-wide trips in the ETA. However, some of these access areas may not be accessible to vessels due to the access area rotational closure schedule (2 years open, 1 year closed) currently stated in the regulations, resulting in areas closing even though trips may have been allocated there in FY 2010 or areas opening but without allocations from FY 2010, as is the case with DMV, HCA, ETA, CA1, NLS, and CAII (Table 4).

2.6.2 Allocations for limited access general category IFQ vessels (PROPOSED ACTION)

LAGC IFQ vessels are allocated 5% of the total ACL and limited access vessels with LAGC permits are allocated 0.5%. This allocation is divided among qualifying vessels based on their contribution factor. Vessels can harvest their quota up to 600 pounds per trip, if the increased possession limit is approved under Amendment 15. LAGC vessels can harvest their quota from open areas or access areas that are available. There is a fleetwide maximum number of LAGC trips set for each area. That maximum trip value is based on 5.5% of the TAC for the area, with the exception of Closed Area II which has a zero trip allocation because of the long distance from shore. LAGC vessels can choose to use these allocated trips, or they can harvest their quota from open areas. Table 19 is a summary of the general category allocations for 2011-2013.

Table 19 – Limited Access General Category allocations under the proposed action (Alternative 1)

2011	Total ACL (after set-asides removed)	LAGC ACL	%
	58,199,000	3,200,945	5.5%
	Total AA TAC	**LAGC TAC in AA**	**LAGC AA trips****
HC	6,470,919	355,901	593
DMV	6,470,919	355,901	593
CAI	9,706,379	533,851	890
CAII	3,050,980	0	0
NL	N/A	N/A	N/A
Total AA	25,699,197	1,245,652	2,076
2012	**Total ACL (after set-asides removed)**	**LAGC ACL**	**%**
	61,862,000	3,402,410	5.5%
	Total AA TAC	**LAGC TAC in AA**	**GC AA trips****
HC	9,680,995	532,455	887
DMV	3,226,998	177,485	296
CAI	3,226,998	177,485	296
CAII	6,086,911	0	0
NLS	3,226,998	177,485	296
Total AA	25,448,901	1,064,909	1,775
2013*	**Total ACL (after set-asides removed)**	**LAGC ACL**	**%**
	61,339,953	3,373,697	5.5%
	Total AA TAC	**LAGC TAC in AA**	**GC AA trips****
HC	9,741,716	535,794	893
DMV	3,247,239	178,598	298
CAI	N/A	N/A	N/A
CAII	6,122,904	0	0
NLS	6,494,477	357,196	595
Total AA	25,606,335	1,071,589	1,786

*** 2013 measures are default and expected to change under future action**
****Allocated as a fleetwide number of trips based on 600 pound trips**

2.6.3 Northern Gulf of Maine (NGOM) Hard-TAC

The Council approved a separate limited entry program for the NGOM with a hard-TAC. Framework 22 will need to consider a separate hard TAC for this area for 2011 and 2012. Individuals qualified for a permit if their vessel had a general category permit when the control date was implemented (November 1, 2004). There is no landings qualification for this permit. Vessels would be restricted to fish in this area under a 200 pound possession limit until the overall hard-TAC was reached. In 2010, 127 vessels qualified for a NGOM permit; 112 were issued, and 15 are permits in CPH. Most vessels are either from Massachusetts (58 vessels) or Maine (31 vessels).

Amendment 11 specifies that the Scallop PDT will recommend a hard-TAC for the federal portion of the scallop resource in the NGOM. The amendment recommends that the hard-TAC be determined using historical landings until funding is secured to undertake a NGOM stock assessment. The hard TAC for 2010 was 70,000 pounds. The recent stock assessment (SAW 50) included a biomass estimate for the NGOM based on a survey that was conducted in that area in 2009. Appendix I includes the results of the NGOM resource survey. Based on these results the PDT concludes that the hard-TAC for the NGOM should be 31,100 pounds. A summary of the PDT analyses related to setting this TAC are below, Section 2.6.3.2.1.

2.6.3.1 No Action (PROPOSED ACTION)

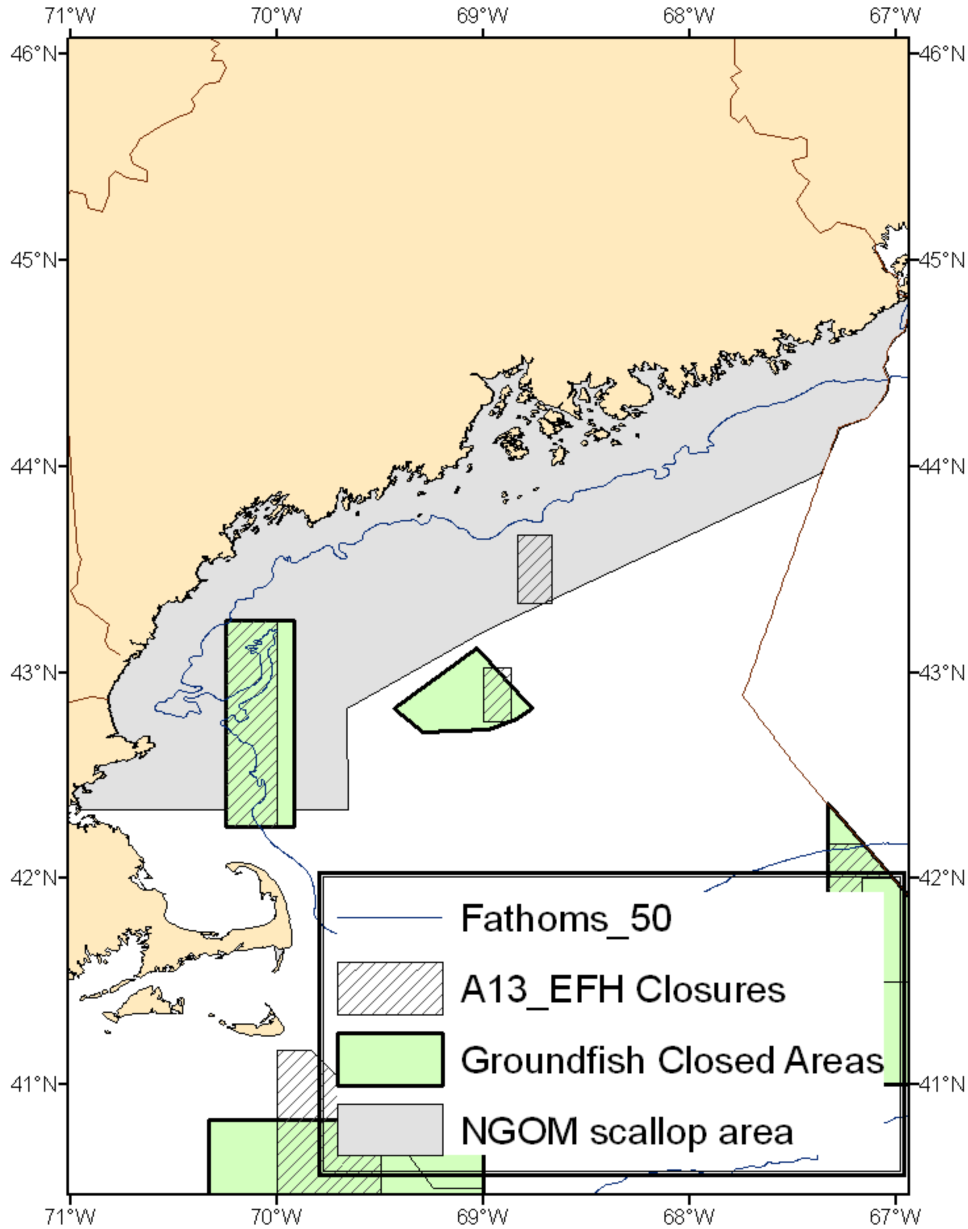
Hard TAC would remain at 70,000 pounds.

This alternative, as well as a value slightly higher was endorsed by the State of Maine, and ultimately the Council as well. The State of Maine submitted correspondence to the Scallop Committee arguing that because landings from state waters by federally-permitted NGOM vessels are also applied to the TAC, the TAC should be increased above just the federal estimate (31,000 pounds) to account for that issue. Based on data provided by the State of Maine, more than 50% of scallop catch by federally-permitted NGOM vessels is caught in state waters. The State also argued that state water surveys are showing signs of increased harvestable biomass, so the chance of a federal TAC closing federally-permitted NGOM vessels out of the state fishery is increased. While most scallop vessels in Maine have opted not to retain a NGOM permit there are about 50 vessels that still retain this permit in Maine.

2.6.3.2 TAC based on recent NGOM biomass estimate of federal waters

Hard TAC would be 31,100 pounds. See Section 2.6.3.2.1 for a summary of analyses used to develop this alternative.

Figure 4 – NGOM scallop management area



2.6.3.2.1 Summary of NGOM resource survey

This section summarizes the analyses used to support Alternative 2.6.3.2. A cooperative survey of the sea scallop resource within federal waters of the Northern Gulf of Maine (NGOM) scallop management area was carried out by the Maine Department of Marine Resources (DMR) and the

University of Maine (UM) in June-July 2009. The survey was focused within five (5) major portions of NGOM federal waters which historically have produced scallops (northern Stellwagen Bank, Cape Ann, Platts Bank, Mt. Desert Rock and Machias Seal Is.). An adaptive random stratified survey design was followed. One hundred and ninety-six (196) stations were sampled in total. Tows lasted either five (5) or seven (7) minutes depending on the bottom type and amount of fixed fishing gear in the area. The survey dredge was a 7 ft. New Bedford style drag with 2 in. rings, 1.75 in. head bale, 3.5 in. twine top, 10 in. pressure plate and rock chains. The dredge was unlined.

Harvestable (≥ 4 in. shell height (SH)) scallop biomass was estimated by applying the shell height to meat weight (SHMW) relationships determined for the eastern and western NGOM to the scallop density by size estimated for each area. Given an exploitation rate of 0.25 and assuming a survey dredge efficiency of 0.5, the median estimated NGOM total allowable catch (TAC) was 44.2 thousand lbs. (Table 20). Bootstrapped biomass confidence interval estimates (50%, 75%, 90%) were calculated. (Although dredge efficiency was not directly estimated in this study, previous work has indicated that a similar dredge used in Cobscook Bay, Maine had an efficiency of 0.436 for ≥ 3.5 in. SH scallops (Kelly 2007), and NMFS has reported that the efficiency of an unlined dredge on hard bottom was 0.54 (Dvora Hart, NMFS/NEFSC, pers. comm.). Using the bounds of the 90% confidence interval, an estimated range for the TAC was 26.0-80.4 thousand lbs. (Table 20). Under a 50% confidence interval, the range was 38.2 – 60.3 thousand lbs.

The PDT discussed using a TAC that would be the lower 25th percentile at a 0.25 exploitation rate and 0.5 dredge efficiency (31.1 thousand. lbs.), if only landings from federal waters were applied to the TAC. Using the lower 25% percentile was supported because there is substantial variability in the federal water biomass estimate in this region and it is a generally accepted principle that data poor/high uncertainty stocks require more precaution.

Since landings from state waters by federally-permitted NGOM vessels are also applied to the quota, however, the Council could consider a higher number which would account for the landings that occur within state waters of the NGOM (currently only data from federal waters are used to develop the TAC). Of the total 9.9 thousand lbs. reported landed by limited access general category (LAGC) NGOM vessels in FY 2008, 57.4% (or 5.7 thousand. lbs.) appeared to have been from ME state waters (source: NMFS VTR).

DMR conducts an annual dredge-based survey within ME state waters and produces a harvestable biomass estimate for the largest portion of its state waters fishery (Cobscook Bay). The most recent (2009) estimate of harvestable biomass in Cobscook Bay was 196.5 thousand lbs (Kevin Kelly, DMR, unpublished data). Since landings of LAGC NGOM vessels from this and other state waters areas of ME, NH and MA are applied to the NGOM quota it may be possible for state waters landings to potentially cause the federal waters quota to be reached during the year and lead to a premature closure of the state waters fishery to LAGC NGOM vessels.

However, landings from vessels with a NGOM permit have been substantially lower than the current TAC of 70,000 pounds. In 2008 the fishery landed 9,939 pounds (14% of TAC), in 2009 catch was 15,534 (22% of TAC), and to date for 2010 catch is at 3,869 through September. Therefore, a lower TAC does not seem to be a major concern since recent catch levels are between 10-15,000 pounds. Since there is great variability in the biomass estimates for this area it may be more justified to reduce the TAC in this framework and re-evaluate in the future.

Table 20 - Estimated mean and median NGOM TAC (lbs., bottom row) with associated confidence intervals of 50%, 75% and 90%, based on 2009 DMR/UM survey.

0.25 exploitation rate									NGOM area	2721	
Dredge Efficiency	0.5										
Associated CI Interval	95%	90%	80%	75%	50%			50%	75%	80%	90%
CI percentile	2.5 (a=0.05)	5 (a=0.1)	10 (a=0.2)	12.5 (a = .25)	25 (a=0.5)	mean	median	75 (a=0.5)	87.5 (a=.25)	90 (a=0.2)	95 (a=0.1)
(per sq km)	7.992	8.68	9.797	10.38	12.73	15.33	14.72	20.12	23.29	24.127	26.82
unc_BIO	21746.232	23618.28	26657.637	28243.98	34638.33	41712.93	40053.12	54746.52	63372.09	65649.567	72977.22
BIO	43492.464	47236.56	53315.274	56487.96	69276.66	83425.86	80106.24	109493.04	126744.18	131299.134	145954.44
TAC(kg)	10873.116	11809.14	13328.8185	14121.99	17319.165	20856.465	20026.56	27373.26	31686.045	32824.7835	36488.61
TAC(lbs)	**23971.12069**	**26034.70065**	**29385.01869**	**31133.66276**	**38182.22802**	**45980.64066**	**44151.01308**	**60347.71625**	**69855.78088**	**72366.26987**	**80443.62573**

2.6.4 Target TAC for limited access incidental catch permits to remain at 50,000 pounds (PROPOSED ACTION)

Amendment 11 includes a provision that the Scallop FMP should consider the level of mortality from incidental catch and remove that from the projected total catch before allocations are made. The amendment requires the PDT to develop an estimate of mortality from incidental catch and remove that from the total. This section includes a summary of the PDT estimate and the value that was removed from the total projected catch before allocations to the limited access and general category fisheries were made. In 2010, 294 vessels qualified for an incidental catch permit; 275 were issued on vessels and 19 in CPH. The majority of permits are on vessels homeported in Massachusetts (113 vessels) followed by New Jersey, Rhode Island, North Carolina and New York.

In Framework 19 the PDT reviewed incidental landings from previous years (<40 pounds per trip) to estimate what level of projected catch should be removed in future years. According to the dealer database, approximately 10,000 to 27,000 pounds of scallops have been landed on trips with less than 40 pounds. According to the VTR database, closer to 30,000 pounds have been caught in previous years in increments less than 40 pounds. The PDT discussed that it is more appropriate to use the VTR data as a starting point for this estimate since incidental catch is not always sold to a dealer (i.e., it is consumed for personal use). The PDT also recommended that the average landings from the VTR database should be increased to some degree to account for an expected increase in scallop landings by incidental catch permits. Since some vessels did not qualify for a limited entry general category IFQ permit under Amendment 11, landing scallops under incidental catch may be the only other alternative for some vessels (assuming the vessels had a general category permit before the control date).

In Framework 21, the PDT recommended taking VTR landings analyzed in FW19 as a starting point for an estimate of mortality from incidental catch and increasing that to 50,000 pounds to account for an expected increase due to measures implemented by Amendment 11. This amount was removed from the total projected catch before allocations to the LA and LAGC fisheries.

During the summer in 2010 the PDT updated these analyses and summarized the number of trips and total catch by general category vessels less than 40 pounds per trip. Permit category C, shaded columns in Table 21 and Table 22 is the permit type that is restricted by this target TAC. Note that prior to 2008 there was only one general category permit type. The landings numbers shown correspond to the permit types classified according to Amendment 11 which was implemented starting June 1, 2008.

While catch is substantially lower than the target TAC of 50,000 pounds, the PDT discussed that there may be some level of reporting uncertainty so it may be worth keeping the TAC at 50,000 pounds for now and re-evaluating it in the next framework. There have not been many years of data to consider since the permit was implemented in the middle of fishing year 2008. Therefore, the PDT did not identify another alternative to consider for this section; a lower TAC is not yet justified.

The Council agreed with this argument and recommended as part of the final action that the target TAC for the incidental catch permit remain at 50,000 pounds.

Table 21 - Number of trips by general category vessels with less than 40 lbs of scallop catch

Fishyear	IFQ (A)	NGOM (B)	Incidental (C)	Grand Total
2007	651	40	409	1100
2008	631	21	409	1061
2009	976	28	594	1598
2010	298	12	210	520

Source: Dealer and permit databases 2010: March to June

Table 22- Scallop landings by general category vessels from trips with less than 40 lbs of scallop catch

Fishyear	IFQ (A)	NGOM (B)	Incidental (C)	Grand Total
2004				26856
2005				33641
2006				36313
2007	16066	924	9366	26356
2008	17096	509	10293	27898
2009	26260	521	18972	45753
2010	7207	296	6691	14194

Source: Dealer and permit databases 2010: March to June

2.7 TAC SET-ASIDES FOR OBSERVERS AND RESEARCH

In Amendment 15 the Council recommended that set-asides for research and observers should be removed from the overall ACL, rather than percentages of open area DAS and access area TACs. More set-aside is actually available when this change is made because it is removed before buffers for management uncertainty are factored in. In the past, set-asides were taken out from the allocation level, what is now known as the ACT, whereas now set asides will be removed from the total ACL level (See Figure 3).

2.7.1 No Action

Research and observer set-asides would remain the same as in FY 2010 for both open and access areas (Table 23).

Table 23 – Research and observer set-aside TACs for FYs 2011 and 2012 under No Action. These values are identical to those of FY 2010.

	Research Set-Aside	Observer Set-Aside
Open Area	269 DAS	135 DAS
ETA	227,060 lb	113,530 lb
Delmarva	117,700 lb	58,850 lb
NLS	117,820 lb	58,910 lb
CAI	N/A	N/A
CAII	N/A	N/A
HCA	N/A	N/A

2.7.2 TAC set-asides for observer and research programs (PROPOSED ACTION)

Table 24 is a summary of the total observer and research set-aside values associated with the proposed action, Alternative 1. The TAC set aside to help defray the cost of carrying an observer will be set at 1% of the overall ABC, and the TAC set aside for the research program is equal to 1.25 million pounds, if approved under Amendment 15.

Table 24 – Summary of set asides for FY 2011 and 2012, as well as default values for FY2013

	2011	2012	2013
RSA	1,250,000	1,250,000	1,250,000
OBS	601,000	638,000	632,727

2.7.2.1 Observer Set-Asides

Observer set-aside used to be based on 1% of projected TAC in access areas and 1% of DAS in open areas. Based on modifications proposed in Amendment 15, the observer set-aside value is now 1% of the ACL or ABC before buffers for management are applied. This total poundage is calculated and is made up of 1% of TACs from access areas open to the fishery, and the remaining poundage up to 1% of the total ACL is available for DAS compensation on observed trips in open areas on limited access vessels. General category trips in open areas are funded directly by the Northeast Observer Program and no this set-aside program. The exact poundage or DAS compensation that vessels receive if they are required to carry an observer is set by NMFS after FW22 is approved. A breakdown of the observer set-aside by area is provided in Table 25.

Table 25 – Summary of observer set-aside by area under the proposed action, Alternative 1

	2011	2012	2013*
Total ABC/ACL	**60,100,000**	**63,800,000**	**63,272,680**
HC	74,360	107,980	126,672
DMV	74,360	35,993	42,224
CAI	111,540	35,993	N/A
CAII	35,060	67,892	79,616
NL	N/A	35,993	84,448
Total AA	295,320	283,853	332,960
Open areas	305,680	354,147	299,767
OA LPUE	2,241	2,662	2,676
OA DAS	136.4	133.0	112.0
All Areas	601,000	638,000	632,727

- 2013 are default measures and are expected to be replaced by a future action

2.7.2.2 Research Set-Asides

In Amendment 15 the Council modified the RSA program so that a fixed poundage be removed from the fishery instead of 2% of access area TAC and 2% of open area DAS. A fixed amount of 1.25 million pounds was identified (Table 24). Therefore, once Amendment 15 is approved, 1.25 million pounds of projected catch will be set-aside for research before allocations are made to the limited access and general category fisheries. This set-aside does not have to be area specific since it is taken off the top, i.e. each area will not have set-asides for research that total up to 1.25 million pounds. As discussed during the Amendment 15 process, making the set-aside area specific can slow the awards process down if awards have to wait until a framework is implemented to allocate area specific pounds or DAS. If Amendment 15 is approved as the Council proposed, the research set-aside will be removed from the top equal to 1.25 million pounds, DAS will no longer be set aside for open areas, and catch will not be associated with specific areas. Since this set-aside is a relatively small portion of the total catch for this fishery, around 2.5% based on a total catch of 50 million pounds, there are minimal impacts from harvesting it in all or only a few areas. However, if the FY 2011 RSA awards are granted after Amendment 15 is approved but before Framework 22 is implemented, the RSA set-aside can only be harvested from open areas. As stated in Amendment 15, FY 2011 RSA award recipients must wait for Framework 22's effectiveness to harvest RSA from within access areas as those areas are not open for scallop harvest until the framework's implementation. Final set-aside values for FY2013 may be replaced with updated values in a future framework.

This action also sets research priorities for 2011-2013, Section 2.7.2.2.1 for 2011 and Section 2.7.2.2.2 for 2012 and 2013. Priorities for 2011 were previously approved, but this action sets the priorities for 2012 and 2013.

As background the projects that were funded with 2010 RSA funds are listed in Table 26.

Table 26 – Summary of 2010 RSA awards

	Project/Title
1	Real-Time Electronic Bycatch Reporting Pilot Project
2	Loggerhead Sea Turtle Ecology on the Sea Scallop Grounds
3	Testing of Modifications to the Cfarm Turtle Excluder Dredge for Bycatch Reduction
4	Tracking a Large Sea Scallop Recruitment Event with High-Resolution Video Survey in the Gulf of Maine
5	High-Resolution Video Survey of the Sea Scallop Resource, Recruitment Patterns, and Habitat of the Hudson Canyon and Delmarva Closed Area
6	An Assessment of Sea Scallop Abundance and Distribution in Selected Closed Areas: Hudson Canyon Closed Area
7	An Assessment of Sea Scallop Abundance and Distribution in Selected Closed Areas: Georges Bank Closed Area 1
8	Scallop, Yellowtail Flounder, and Substrate Distribution in the Closed Area II Scallop Access Area and the Western Side of the Great South Channel

2.7.2.2.1 Research priorities for 2011 (ALREADY APPROVED)

The RSA announcement for federal funding came out earlier than in previous years in an attempt to expedite the process. Before 2010 the announcement came out after final decision on the Framework when final allocations were known. This resulted in delayed responses and made it very difficult for researchers to complete all compensation for research before the end of the fishing year. In 2010 the announcement for available funding came out in June 2009; it did not include the precise amounts of RSA available and did not require applicants to apply for a certain amount of RSA compensation in DAS and/or access area pounds. Instead, applicants included an estimate of what their research and compensation needs were in dollar values.

The Scallop Committee approved research priorities in May 2010 for the 2011 fishing year so that the announcement for funding could be available earlier again, June 2010. The list below includes the research priorities approved by the Scallop Committee on May 19, 2010. As suggested by the PDT, the Committee supported moving two research issues from the "other" category to "medium" to recognize that they are more important research issues for management. Specifically, the recent assessment (SAW50) identified that there are several critical aspects of scallop biology that are still relatively uncertain: incidental gear mortality, discard mortality and seasonal growth. In addition, recent fishery data and industry input suggests that there is additional scallop biomass outside of the current survey strata, so specific surveys of these areas could help better define the total scallop biomass. <u>These two modifications have been underlined below</u>; all other research priorities are the same from the 2010 RSA program.

HIGHEST PRIORITIES (not listed in order of importance):

- An intensive industry-based survey of each of the access areas (access areas in Georges Bank including Closed Area I, Closed Area II, and Nantucket Lightship, as well as Elephant Trunk, Delmarva, and Hudson Canyon). These surveys can then be used to estimate total allowable catches (TACs) under the rotational area management program if the data from these surveys are available by August 2010.

- Identification and evaluation of methods to reduce bycatch of all managed species (i.e., gear research).

MEDIUM PRIORITY (not listed in order of importance):

- Identification of sources of sea turtle interactions and/or identification of ways to minimize interactions with sea turtles. Two priority topics identified include evaluation and analysis of factors affecting bycatch rates of sea turtles and development of scallop dredge and trawl operations that would reduce or eliminate the threat or harm of sea turtle interactions. Other issues related to sea turtle research include, but are not limited to: gear modifications or fishing techniques that may be used to reduce or eliminate the threat of sea turtle interactions without unacceptable reduction in scallop retention, using available and appropriate technology to quantify the extent that chain mats reduce turtle mortalities, comparison and analysis of turtle capture rates of similar gear in other fisheries, and turtle behavior.
- Scallop biology, specifically studies aimed at understanding incidental gear mortality, discard mortality and seasonal growth.
- Other surveys, including areas not surveyed by the annual NMFS survey (i.e., federal waters in the Northern Gulf of Maine management area and Southern New England).

OTHER PRIORITIES (not listed in order of importance):

- Scallop biology, including studies aimed at understanding recruitment processes (reproduction, larval and early post-settlement stages), growth, and natural mortality (including predation and disease).
- Identification and evaluation of methods to reduce habitat impacts, including, but not limited to: broader investigation of variability in dredging efficiency across habitats, times, areas, and gear designs; and research on habitat effects from scallop fishing and development of practicable methods to minimize or mitigate those impacts.
- Habitat characterization research including, but not limited to: video and/or photo transects of the bottom within scallop access areas and within closed scallop areas and in comparable fished areas that are both subject and not subject to scallop fishing before and after scallop fishing commences; development of high resolution sediment mapping of scallop fishing areas using Canadian sea scallop industry mapping efforts as an example process; identification of nursery and over-wintering habitats of species that are vulnerable to habitat alteration by scallop fishing; and other research that relates to habitats affected by scallop fishing, including, but not limited to, long-term or chronic effects of scallop fishing on marine resource productivity, other ecosystem effects, habitat recovery potential, and fine scale fishing effort in relation to fine scale habitat distribution. In particular, projects that directly support evaluation of present and candidate EFH closures and HAPCs to assess whether these areas are accomplishing their stated purposes and to assist better definition of the complex ecosystem processes that occur in these areas.
- Improved information concerning scallop abundance and evaluation of the distribution, size composition, and density of scallops, including but not limited to: efforts to develop a cooperative industry-based resource survey, high resolution surveys that include distribution, biomass of exploitable size scallops, recruitment, mortality, and growth rate

information, research that provides more detailed scallop life history information (especially on age and area specific natural mortality and growth) and to identify stock-recruitment relationships, intensive sampling on both sides of access boundaries for fishing year 2007 and in subsequent years to gauge the short-and long-terms effects of fishing on the resource.

- Scallop and area management research, including but not limited to: evaluation of ways to control predation on scallops; research to actively manage spat collection and seeding of sea scallops; social and economic impacts and consequences of closing areas to enhance productivity and improve yield of sea scallops and other species; and estimation of factors affecting fishing power for each limited access vessel.
- Research projects that would help calibrate the transition of the federal dredge survey, or projects that compare various survey techniques and methods that would assist with the current transition period of the federal scallop dredge survey.

2.7.2.2.2 Research priorities for 2012 and 2013 (PROPOSED ACTION)

The announcement for available funds for the 2012 RSA program will likely be announced in the summer of 2011. In order to identify research recommendations before that time the PDT, AP and Committee will review the priorities approved for the 2011 program and make recommendations for the Council to approve in Framework 22. For this section, the research priorities for 2012 and 2013 could be the same ones approved for 2011 (Section 2.7.2.2.1) – No Action for research priorities; or as revised below.

The research priorities, with updates underlined below, were developed by the PDT, AP, and Committee. The Council reviewed them at the final Council meeting and approved the final research priorities for 2012 and 2013 as defined below. After Framework 22 is approved in November the priorities below will be submitted to NMFS to publish in the 2012 and 2013 RSA announcement. The proposed action for 2012-2013 research priorities are described below.

HIGHEST PRIORITIES (not listed in order of importance):

- An intensive industry-based survey of each of the access areas (access areas in Georges Bank including Closed Area I, Closed Area II, and Nantucket Lightship, as well as Delmarva, Hudson Canyon, <u>and Great South Channel, if approved</u>). These surveys can then be used to estimate total allowable catches (TACs) under the rotational area management program if the data from these surveys are available by August of the prior fishing year.
- Identification and evaluation of methods to reduce bycatch of all managed species <u>including projects that determine seasonal bycatch rates of yellowtail, and other key bycatch species</u>.
- Research to support the assessment of the loggerhead turtle population in the Mid-Atlantic (i.e. satellite tagging and investigation of seasonal movements, etc.); identification of sources of sea turtle interactions and/or identification of ways to minimize interactions with sea turtles. Priority topics identified include development <u>and monitoring</u> of scallop dredge and trawl operations that would reduce or eliminate the threat or harm of sea turtle interactions. Other issues related to sea turtle research include, but are not limited to: gear modifications or fishing techniques that may be used to reduce or eliminate the threat of sea turtle interactions without unacceptable reduction

in scallop retention, using available and appropriate technology to quantify the extent that gear modifications reduce turtle mortalities, and turtle behavior.

MEDIUM PRIORITY (not listed in order of importance):

- Other resource surveys, to expand and/or enhance the NMFS annual dredge survey including open areas and determine NMFS survey dredge efficiency in those other resource areas
- Scallop biology, specifically studies aimed at understanding incidental gear mortality, discard mortality and seasonal growth.

OTHER PRIORITIES (not listed in order of importance):

- Scallop biology, including studies aimed at understanding recruitment processes (reproduction, larval and early post-settlement stages), growth, and natural mortality (including predation and disease).
- Identification and evaluation of methods to reduce habitat impacts, including, but not limited to: broader investigation of variability in dredging efficiency across habitats, times, areas, and gear designs; and research on habitat effects from scallop fishing and development of practicable methods to minimize or mitigate those impacts.
- Habitat characterization research including, but not limited to: video and/or photo transects of the bottom within scallop access areas and within closed scallop areas and in comparable fished areas that are both subject and not subject to scallop fishing before and after scallop fishing commences; development of high resolution sediment mapping of scallop fishing areas using Canadian sea scallop industry mapping efforts as an example process; identification of nursery and over-wintering habitats of species that are vulnerable to habitat alteration by scallop fishing; and other research that relates to habitats affected by scallop fishing, including, but not limited to, long-term or chronic effects of scallop fishing on marine resource productivity, other ecosystem effects, habitat recovery potential, and fine scale fishing effort in relation to fine scale habitat distribution. In particular, projects that directly support evaluation of present and candidate EFH closures and HAPCs to assess whether these areas are accomplishing their stated purposes and to assist better definition of the complex ecosystem processes that occur in these areas.
- Improved information concerning scallop abundance and evaluation of the distribution, size composition, and density of scallops, including but not limited to: efforts to develop a cooperative industry-based resource survey, high resolution surveys that include distribution, biomass of exploitable size scallops, recruitment, mortality, and growth rate information, research that provides more detailed scallop life history information (especially on age and area specific natural mortality and growth) and to identify stock-recruitment relationships, intensive sampling on both sides of access boundaries for fishing year 2007 and in subsequent years to gauge the short-and long-terms effects of fishing on the resource.
- Scallop and area management research, including but not limited to: evaluation of ways to control predation on scallops; research to actively manage spat collection and seeding of sea scallops; social and economic impacts and consequences of closing areas to enhance productivity and improve yield of sea scallops and other species; and estimation of factors affecting fishing power for each limited access vessel.

- If a habitat research area is identified in a future action, allow RSA funds to be used for projects to enhance scallop production using rotational strategies.
- Develop methodologies for the scallop fleet to collect and analyze catch data on a near real-time basis (i.e. meat weight, bycatch, etc. "Study fleet" concept).
- Continue scallop dredge environmental impact studies.

2.8 CONSIDERATION OF NEW ROTATIONAL AREA IN THE GREAT SOUTH CHANNEL (INCORPORATED IN SECTION 2.4.1.4 – ALTERNATIVE 3)

Amendment 10 defines the criteria for closing an area to protect young scallops. Under adaptive area rotation, an area would close when the expected increase in exploitable biomass in the absence of fishing mortality exceeds 30% per year and re-open to fishing when the annual increase in the absence of fishing mortality is less than 15% per year. Identification of areas would be based on a combination of the NEFSC dredge survey and available industry-based surveys. The boundaries are to be based on the distribution and abundance of scallops at size; ten-minute squares are the basis for evaluating continuous blocks that may be closed. The guidelines are intended to keep the size of the areas large enough and regular in shape to be effective, while allow a degree of flexibility. The Council and NMFS are not bound to closing an area that meets the criteria and the Council and NMFS may deviate from the guidelines to achieve optimum yield.

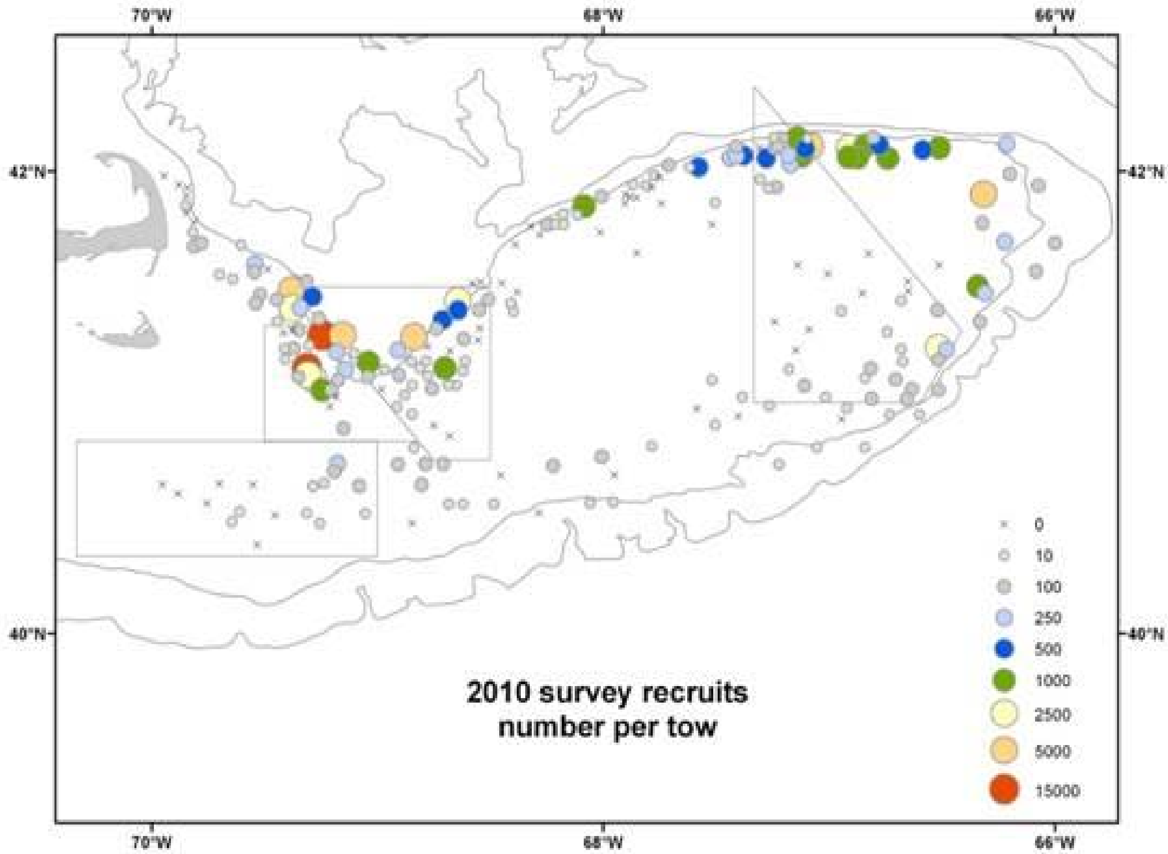
If any areas qualify, the area would close to all scallop vessels and vessels would not be permitted in that area until a later date when biomass estimates project higher yields. The Council is not required to implement these rotational closed areas just because they meet the criteria recommended in Amendment 10 for new closures, but they should be considered.

The PDT and Committee discussed that if large concentrations of small scallops are seen in the Channel area again it may not be advantageous to consider the same area in FW22. The Council chose not to close that area in both FW19 and FW21 for a handful of reasons that still exist. However, the Committee is supportive of the PDT exploring slightly different alternatives that may not maximize yield in that area, but increase it compared to leaving the area open. For example, a smaller or similar area could close in 2011 only and reopen in 2012, rather than closing the area for three years. That would protect the large year classes that were seen in that area in 2008 and 2009 for one more year increasing yield for an opening in 2012.

The PDT reviewed updated biomass estimated for that area and growth estimates are about 45%, which is well above the 30% threshold suggested in the adaptive area rotation program. The PDT explored an alternative (Alternative 3) that would close the channel for one year (2011) and it would reopen as an access area with controlled effort in 2012. After 2012 the area would continue as an access area until growth rates slow down and it reverts back to an access area. Vessels would be allocated 2.5 trips in 2012.

<u>This is not a stand alone alternative; it is incorporated in Allocation Alternative 3 (Section 2.4.1.4).</u> This separate section has been left in the document to clarify why and how a new access area alternative is considered under the area rotation system. See Table 8 for a comparison of how this measures is incorporated in the allocation alternatives considered.

Figure 5 – Scallop recruitment on Georges Bank from the 2010 federal survey (scallops less than 70mm) with potential boundaries for a scallop rotational area within the Great South Channel



2.9 EFFORTS TO MINIMIZE INCIDENTAL TAKE OF SEA TURTLES AS PER THE MARCH 14, 2008 SCALLOP BIOLOGICAL OPINION

On March 14, 2008, NMFS completed an ESA Section 7 Consultation on the Atlantic Sea Scallop Fishery Management Plan.[1] Under the ESA, each Federal agency is required to ensure its actions are not likely to jeopardize the continued existence of any listed species or critical habitat. If a Federal action is likely to adversely affect a listed species, formal consultation is necessary. Five formal Section 7 consultations, with resulting biological opinions, have been completed on the Atlantic sea scallop fishery to date. All five have had the same conclusion: the continued authorization of the scallop fishery may adversely affect, but is not likely to jeopardize the continued existence of four sea turtles (loggerheads, green, Kemp's ridley, and leatherback).

In the accompanying Incidental Take Statement, NMFS is required to identify and implement non-discretionary reasonable and prudent measures (RPMs) necessary or appropriate to minimize the impacts of any incidental take, as well as Terms and Conditions (T/C) for implementing each RPM. RPMs and T/C cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes. Five RPMs and T/Cs were identified in the March 2008 biological opinion. One RPM requires a limit of effort in the Mid-Atlantic during times when sea turtle distribution is expected to overlap with fishing activity; the other four are related to ongoing research needs and identification of measures to reduce interactions and/or the severity of such interactions.

The language of the first RPM and term and condition are below:

Reasonable and Prudent Measures

NMFS has determined that the following reasonable and prudent measures are necessary or appropriate to minimize impacts of incidental take of sea turtles:

NMFS must limit the amount of allocated scallop fishing effort by "Limited access scallop vessels" as such vessels are defined in the regulations (50 CFR 648.2), that can be used in the area and during the time of year when sea turtle distribution overlaps with scallop fishing activity (amended February 5, 2009).

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, and regulations issued pursuant to section 4(d), NMFS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

To comply with 1 above, no later than the 2010 scallop fishing year, NMFS must limit the amount of allocated limited access scallop fishing effort that can be used in waters south of the northern boundaries of statistical areas 612, 613, 533, 534, 541-543 during the periods in which turtle takes have occurred. Restrictions on fishing effort described above shall be limited to a level that will not result in more than a minor impact on the fishery. (Amended February 5, 2009)

[1] The full biological opinion can be found at http://www.nero.noaa.gov/prot_res/section7/.

Framework 21 was the first action that implemented fishery specifications after this biological opinion took effect. The Council considered a range of options to comply with these requirements and ultimately selected a combination of measures that limited the number of trips each limited access vessel can take in Mid-Atlantic access areas between June 15 and October 31, as well as a seasonal closure in both Delmarva and Elephant Trunk from September 1 through October 31.

The alternatives in this section have been developed to comply with the RPM and T/C above. The figure below depicts the area that is referenced in the first Term and Condition. It is referenced as the "Mid-Atlantic" within this document.

Interactions between sea turtles and dredge gear occurred from June to October (Figure 7; Murray, 2011). Estimated interactions rates were higher from July through October compared to other months (Figure 8; Murray, 2011). These figures were used to help identify the months for the seasonal closure RPM alternatives in Delmarva and Hudson Canyon.

During review of the biological opinion and development of Framework 21 the PDT developed a method to identify a threshold for a more than minor impact on the fishery. The more than minor analysis evaluates the percent change in effort shift caused by a specific limitation on effort, and the resulting impact that shift would have on overall fishing mortality imposed by the RPM and Term and Condition. A model was developed that estimated changes in *F*, effort shifts and impacts on revenue when limitations are placed on the scallop fishery by season and/or area. The PDT used this approach for Framework 21 in terms of assessing which measures meet the requirements of an RPM in terms of whether they have more than a minor impact on the fishery.

The PDT plans to use a similar approach for assessing the alternatives considered in this action and whether they are expected to cause a more than minor change on the fishery based on projected effort patterns for 2011 and 2012. See Section 5.3.8.1.1 for a detailed description of the analyses used to determine a more than minor impact and the overall impacts of the RPM measures.

Figure 6 – Area defined as the "Mid-Atlantic" in the 2008 biological opinion - waters south of the northern boundaries of statistical areas 612, 613, 533, 534, 541, 542, and 543.

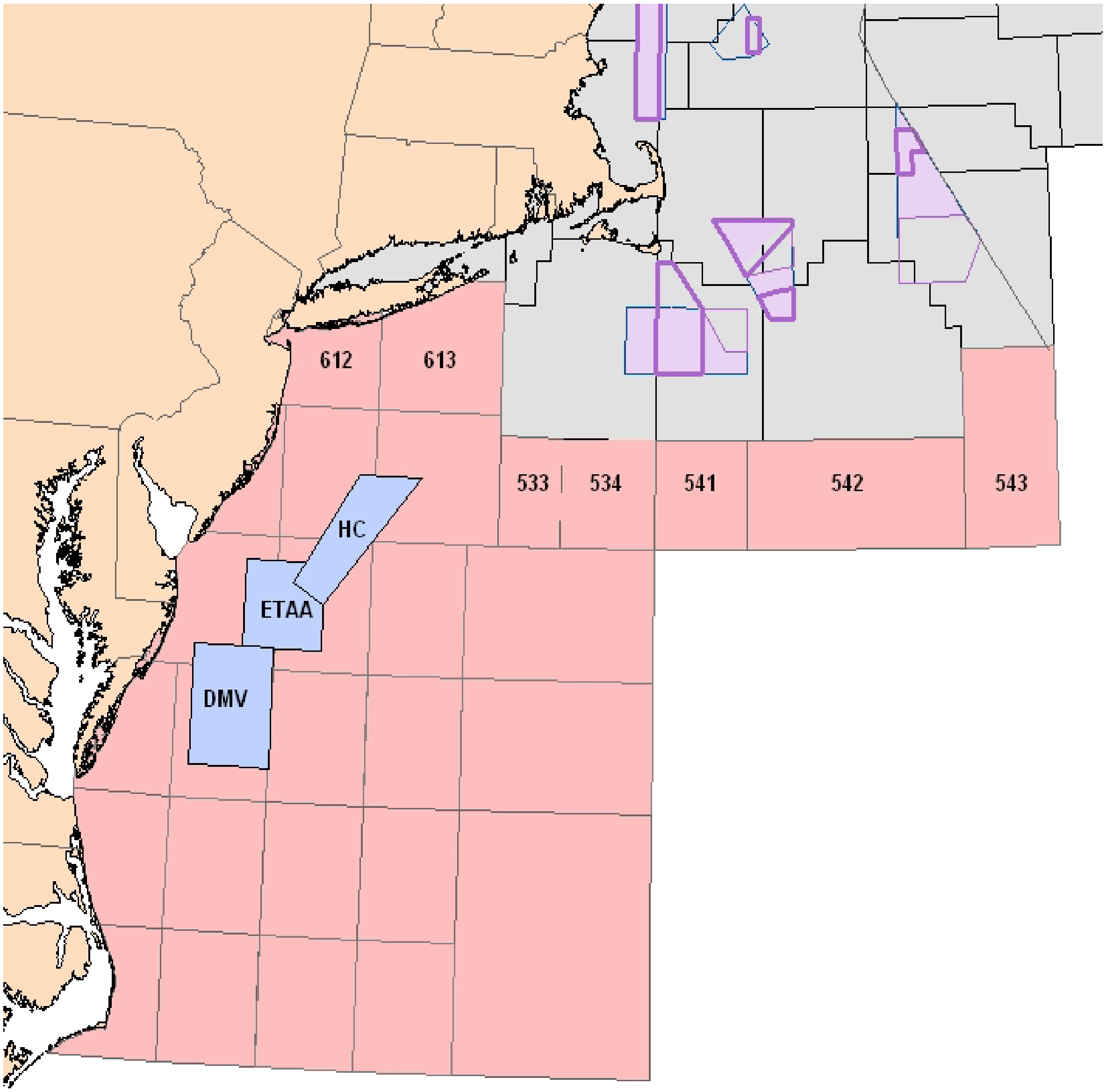


Figure 7 - Distribution of observed sea turtles in scallop dredge gear during on-watch hauls 2001-2008, showing boundaries of Mid-Atlantic study area and Mid-Atlantic scallop fishery management areas. Unidentified turtle species are in gray, and the turtle outside of the study area is a Kemp's ridley. HCAA = Hudson Canyon Access Areas, ET = Elephant Trunk, DM = Delmarva.

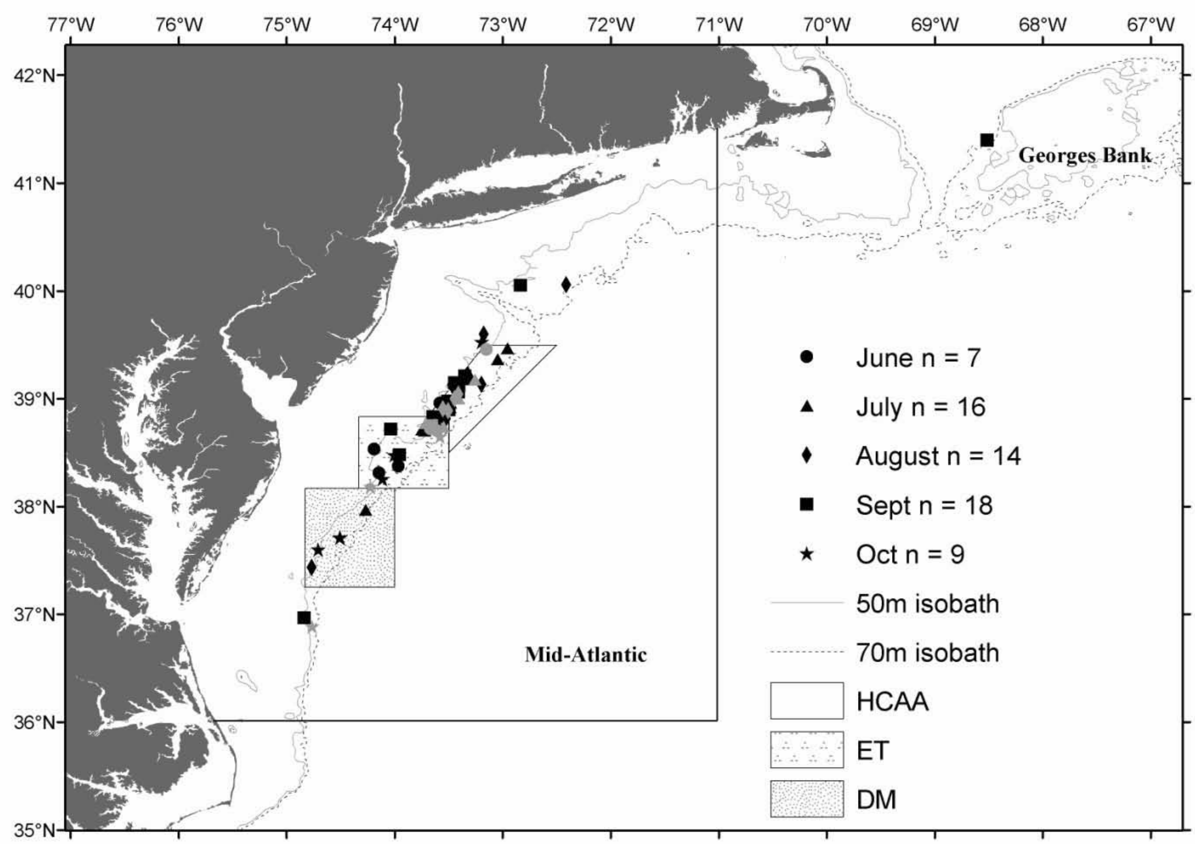
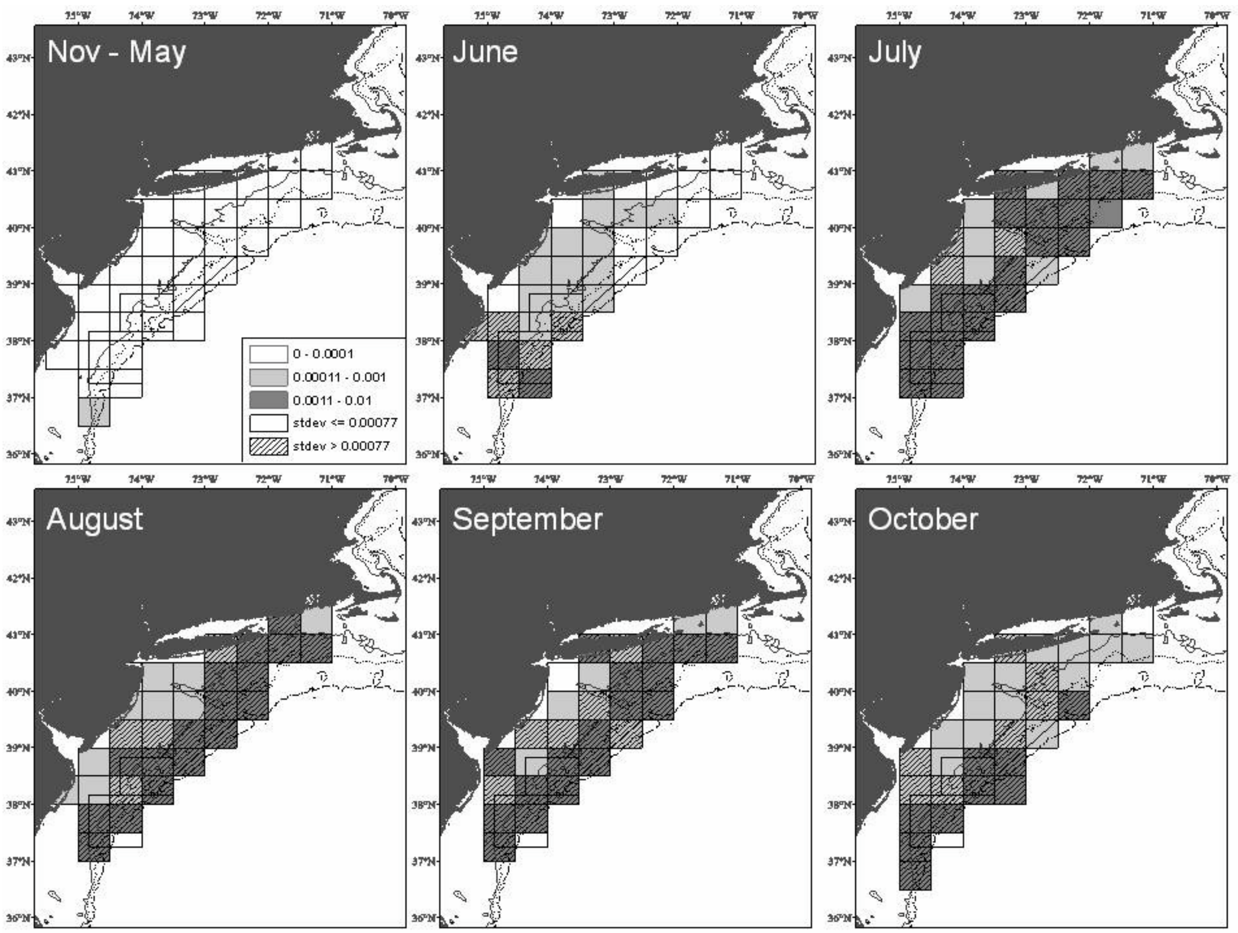


Figure 8 - Distribution over 30' squares of average predicted interaction rates without chain mats on VTR dredge trips, 2001-2008. Squares with fewer than 10 VTR trips have been excluded. The 50m, 70m, and 200m bathymetry lines are shown. From north to south, the Hudson Canyon Access Area, Elephant Trunk, and Delmarva scallop management areas are represented by the black rectangles. Median standard deviation around rates over all months = 0.00077.



2.9.1 Alternatives to minimize impacts of incidental take of sea turtles

2.9.1.1 No Action

Under No Action the current measure to minimize turtle interactions implemented under FW21 for the 2010 fishing year would rollover; closing the ETAA and Delmarva turtle closures in September and October and restricting the number of trips that can be fished in these Mid-Atlantic access areas during June 15 – August 31.

2.9.1.2 Restrict the number of open area DAS a vessel can use between July and September in the Mid-Atlantic

This alternative would set a maximum on the number of allocated open area DAS each limited access vessel can use in the area defined as the Mid-Atlantic from July 1 through September 30. The maximum number of DAS that can be used will be identified as the maximum number of DAS before any less DAS would have “more than a minor impact” on the fishery as defined by the PDT analyses in Section 5.3.8.1.1. Measures to comply with a reasonable and prudent measure cannot have more than a minor impact on the fishery.

2.9.1.3 Restrict the number of access area trips in the Mid-Atlantic that can be used between June 15 - Oct 31 (PROPOSED ACTION)

This alternative would restrict the number of allocated access area trips that can be taken in the Mid-Atlantic between June 15 and October 31. In both 2011 and 2012 a total of two trips are allocated to Mid-Atlantic access areas. This alternative would restrict when those trips can be taken in terms of placing a maximum on the number that can be taken during June 15 – October 31. The maximum number of trips that can be taken in this window of time will be identified as the maximum number of trips before any fewer trips would have “more than a minor impact” on the fishery as defined by the PDT analyses in Section 5.3.8.1.1. Measures to comply with a reasonable and prudent measure cannot have more than a minor impact on the fishery. This restriction would not change any seasonal closures under consideration for Delmarva or Hudson Canyon.

The Committee passed the motion below, which identifies this alternative as preferred with an additional caveat.

> *The Committee would support a RPM of one access area trip maximum in the Mid-Atlantic with no seasonal closures. In addition, a caveat should be included that if someone traded in two additional Mid-Atlantic access area trips (to have four total), he would be limited to taking two during the turtle window instead of one.*

The Council agreed with the caveat the Committee added and that is included in the final measure.

2.9.1.4 Seasonal closure for Delmarva

This alternative would consider a seasonal closure of the entire access area to both general category and limited access scallop vessels. While the RPM only specifies that these measures need to limit effort for the limited access fishery, the PDT recommends this restriction for both fleets to be consistent with the previous seasonal closure in Elephant Trunk and to further minimize impacts on turtles. Measures to comply with a reasonable and prudent measure cannot have more than a minor impact on the fishery.

2.9.1.4.1 September through October

This is the range of time the area was closed in 2010 under FW21. Some of the observed takes in Delmarva were during this window of time and could be expected in this area as turtles migrate (Figure 7). Furthermore, the impacts on fishery expected to be minimal since this overlaps with a warm season when meat weights are lower and quality is below average when scallops are post-spawning.

2.9.1.4.2 July through October

The PDT added this alternative in FW22 to extend the seasonal closure to encompass months with high estimated turtle interaction rates within the Delmarva area. It was recognized that this length of time may be too long in terms of having more than minor impacts on the fishery, but it was recommended to see if analyses found it to be too burdensome. July and August typically have higher scallop meat weights than September and October and the more than minor analyses should show that.

2.9.1.5 Seasonal closure in Hudson Canyon <u>for 2012 and 2013 only</u>

This alternative would consider a seasonal closure of the entire access area to both general category and limited access scallop vessels. While the RPM only specifies that these measures need to limit effort for the limited access fishery, the PDT recommends this restriction for both fleets to be consistent with the previous seasonal closure in Elephant Trunk and to further minimize impacts on turtles. Measures to comply with a reasonable and prudent measure cannot have more than a minor impact on the fishery. The PDT does not recommend a seasonal closure for Hudson Canyon in 2011 because it will likely not open until June, when FW22 is in place. Therefore, both of these alternatives are for 2012 and 2013 only. For example, if a seasonal closure was implemented in FY2011 from July through September in 2011 it would therefore shift all the effort into Hudson Canon during October - February, when meat weights are poor. Since the FW will not be implemented before June 2011, the area will continue to be closed to all scallop fishing until that time.

2.9.1.5.1 August through September

This time period was identified as the season when most observed turtle takes occurred balanced with the months when scallop meat weights are lower. August does have higher meat weights, but that is a month when more turtles may be in that area since it is further north compared to other access areas further south.

2.9.1.5.2 July through September

The PDT added this alternative in FW22 to encompass months with high estimated turtle interaction rates in the HC area. It was recognized that this length of time may be too long in terms of more than minor impacts on the fishery, but it was recommended to see if analyses found it to be too burdensome. July and August typically have higher scallop meat weights than September and October and the more than minor analyses should show that.

2.9.1.6 Combined measures – only if stand alone ones do not have more than minor impact

Based on results of stand alone measures, the PDT determined whether combined measures are warranted. Two specific combined measures were considered:

- *One trip max in MA access areas and seasonal closure in Delmarva(Sept - Oct)*
- *For 2012 and 2013 – seasonal closures in Delmarva for July - Oct and in Hudson Canyon for August-Sept*

2.10 MODIFICATIONS TO VESSEL MONITORING SYSTEMS

Two specific requests about VMS were raised to the Committee for consideration in FW22. As the Committee reviewed these restrictions it was discussed that more changes to the VMS program may be needed to make the program as consistent and cost effective as possible.

2.10.1 No Action (PROPOSED ACTION)

Under No Action, the current VMS regulations will stay in place, allowing for LAGC vessels to reduce VMS costs by powering down their VMS units when at the dock/mooring or when the vessel is out of the water. However, if these vessels have other permits that require VMS (i.e., multispecies, monkfish, herring, surfclam/ocean quahog, or the limited access scallop permits), their ability to power down are dependent upon the more restrictive provisions of these permits. For example, if a vessel also has a multispecies or limited access scallop permit, they are required to follow the more restrictive VMS regulations and would only be able to power down for at least 72 hours with the vessel out of the water or for a minimum of 30 days, during which the vessel must stay at the dock/mooring. Both of these situations require the vessel owner/operator to call the Office of Law Enforcement to receive a Letter of Exemption.

2.10.2 Allow a vessel to turn VMS unit off if it does not intend to land scallops

If a vessel does not intend to land scallops it would not have to have an active VMS unit.

When this alternative was reviewed by NMFS Office of Law Enforcement (OLE), their initial response was that the provision requires that the vessel should be rendered "incapable from scallop fishing" for the remainder of the fishing year. Furthermore, the name and location of the vessel(s) removing said units have to be reported by the owners to OLE immediately.

The Committee initially decided that the FW should allow vessels to turn off their VMS if they do not intend to land scallops if they render their vessels incapable of landing scallops (remove dredge, wire, and main block). However, additional input from the AP and the NMFS Office of Law Enforcement suggested that this could be very difficult to define, there are other FPMs that would still require the use of VMS, and allowing vessels to turn off their VMS units while at sea could compromise enforcement.

2.11 REVISIT THE POSSESSION LIMIT OF IN-SHELL SCALLOPS SEAWARD OF THE DEMARCATION LINE

This alternative would reduce the possession limit seaward of the VMS demarcation line from 100 bu to something less (i.e. 65 or 75bu). NMFS Enforcement agents have voiced concerns that the regulations allow for LAGC vessels to possess up to 100 bu of scallops seaward of the VMS Demarcation Line, but prohibit vessels from possessing more than 50 bu when shoreward of the VMS Demarcation Line has influenced fishing behavior. There are reports that vessels are targeting more scallops and buoying them off to be landed the next day.

The PDT discussed that this activity did not seem to be illegal, but agreed that 100 bushels may be excessive for a 400 pound of scallop meat limit. The additional bushels were permitted through Amendment 11 to acknowledge that there is seasonal and spatial variation in meat yield, so some flexibility is warranted, but 100 bushels may be too high. The PDT is not sure how prevalent this activity is and if there are any quality and mortality issues.

The Committee decided to forward this issue to the AP to see how widespread this issue is and to ask the PDT if this is a significant problem or not and to consider what a more appropriate bushel equivalent would be to account for meat weight variations.

The PDT reviewed seasonal/area meat weight data from the observer program for this alternative. Analyses support that a lower possession limit is warranted, but in light of the recent decision to increase the possession limit to 600 pounds, the PDT recommends that the possession limit stay at 100 bushels. This amount should provide some flexibility to account for seasonal and temporal changes in meat weight, but not high enough to increase incentive to shell stock or change fishing behavior.

2.11.1 No Action (PROPOSED ACTION)

Possession limit seaward of the demarcation line would remain at 100 bu. even with increased possession limit of 600 pounds.

2.11.2 Reduce possession limit of in-shell scallops seaward of the VMS demarcation line

This alternative is moot based on decision in Amendment 15 to increase the possession limit from 400 pounds to 600 pounds.

2.12 EXTENSION OF UNUSED ELEPHANT TRUNK ACCESS AREA TRIPS THROUGH MAY 31, 2011

This alternative would allow full-time vessels to use any unused FY 2010 ETA trips through May 30, 2011. Since catch rates are low in the ETA this extension would hopefully reduce negative impacts on the scallop resource by shifting trips that would be taken between now and February 28, 2010 until the spring of 2010 before May 30 when scallop meat weights are larger. This would reduce fishing mortality of remaining trips that have not been taken. To date, 6.9 million pounds of scallops have been harvested out of ETA through mid-October, leaving about 5 million pounds. In 2009, about 80% of catch in ETA was harvested at this point in the fishing year, assuming the same trend for 2010, would mean that about 1.7 million pounds will be harvested before the end of FY2010, about 96 trips. This could even be an overestimate of the number of trips potentially left since some trips are partial trips and those would not be allowed to be extended beyond the end of the 2010 fishing year. This extension would only apply to vessels that have one or two fully unused trip(s) at the end of 2010.

Because each full-time vessel will be allocated 2 trips as the start of FY 2011 until Framework 22 is implemented under No Action, they would be able to use one trip or two trips, depending on how many full trips they had remaining from FY 2010, without any payback measures applied once Framework 22 is implemented. This alternative is only applicable to FY 2010 allocated trips that were not used or declared during FY 2010, as compensation trips from ETA trips that were declared and broken during FY 2010 can be used up to 60 days into FY2011 (May 1, 2011) or until Framework 22 is implemented and the ETA reverts to an open area, whichever occurs first.

2.12.1 No Action (PROPOSED ACTION)

Unused 2010 ETA trips expire on February 28, 2011.

2.12.2 Extension of unused 2010 ETA trips through May 31, 2011

If adopted, any unused trips could be fished before May 31, 2011.

2.13 ELIMINATE SCHEDULE OF GEORGES BANK ACCESS AREAS IN REGULATIONS

Time and time again, the default schedule of access areas on GB has created confusion of regulatory inconsistencies. The schedule was added to the regulations when Amendment 10 implemented area rotation. In some instances, access areas on Georges Bank do follow the schedule outlined in the regulations of one year open, two years closed, but that is not always the case. Openings should be based primarily on scallop resource and other factors like YT bycatch available, and not a default schedule that may not match current schedules and biological constraints.

Therefore, this alternative would eliminate any reference to the three-year schedule of access areas on GB.

2.13.1 No Action

No modifications would be made to the regulations related to the GB access area schedule.

2.13.2 Eliminate reference to Georges Bank access area schedule in the regulations (PROPOSED ACTION)

Section 648 Subpart D of the fishery regulations of the Northeast related to the scallop fishery will be modified to eliminate any reference to a rotational area schedule on Georges Bank. For example, the regulations include schedules with one year open, two years closed etc. for the various access areas on GB. This has caused confusion and regulatory inconsistency. Instead the access area schedule on GB and for all access areas will be specified in framework actions, no default schedule will apply.

3.0 CONSIDERED AND REJECTED ALTERNATIVES

3.1 Extend exemption in GSC for LAGC IFQ vessels in April – June

This alternative would extend exemption in the GSC area in April-June for LAGC IFQ permit holders if data support it. This issue was raised during development of FW21 but was delayed until FW22 because there was not time to make FW21 a joint action and there was insufficient time to analyze it.

Rationale for rejection: In April 2010 the Council passed a motion to include this alternative in Framework 45 to the Multispecies FMP. That is the appropriate FMP to implement this exemption. Final action on that framework is expected in November 2010, the same as FW22.

3.2 Gear modifications to reduce YT bycatch

The specific gear restrictions discussed were modifications to twine top regulations (reduce the hanging ratio and institute a minimum twine top length - i.e. maximum of seven rings up from the club stick) and require all vessels to use the “turtle dredge”. The twine top issues seem straight forward, but the only research available is a master’s thesis. These modifications are not expected to have major impacts on reducing bycatch, but small adjustments could help the larger issue. It was discussed that the wording would have to be very specific so it is can be enforced correctly. For example, not more than 2:1 ratio, or a range, or specify that the hanging ratio can’t exceed 2.5 ratio. It was also discussed that the industry should consider doing this voluntarily to avoid complicated gear regulations. The PDT will explore the status of these reports and determine if they can even be used to support a Council action; specifically, do they meet the RSC standards.

As for the turtle dredge it was explained that many vessels are currently using this dredge already and while there is some analyses available, more is going to be done this summer. The PDT requested that the Observer Office provide some data on scallop gear so we have a better idea of what vessels are currently doing now. For example, what is the average number of rings, number of mesh on the side, hanging ratio, how many vessels are already using the turtle dredge and in what areas.

Rationale for rejection: The Committee decided not to consider gear modifications in this action due to the complexity of gear regulations and the time and analysis the alternatives would take. In addition, research is planned for this topic and it would be more beneficial to wait to include the results.

3.3 Revisit non-payment of observer provider issue

In Framework 21 the Council considered an alternative to discourage vessel owners from not paying deployed observers by not reissuing permits to vessels that hadn’t paid observer providers for fees. Ultimately, the Council decided not to pursue this alternative due to the fact that the NMFS Office of General Counsel (OGC) and Office of Enforcement (OLE) was concurrently developing a process to address observer non-payment issues based on a permit sanction provision currently in the MSA After further review of the current permit sanction by OLE and OGC, NMFS has determined that an adjustment to the regulations would be necessary in order to impose permit sanctions on vessels that have not paid for observers. Specifically, NMFS has identified that the lack of clear definitions of what constitutes a payment (*i.e., does it include interest on unpaid payments?)* and when it is determined to be overdue (*i.e., did the customer have knowledge of when the provider required payment?*) have made it difficult to impose a permit sanction due to non-payment violations.

NMFS has determined that this can be resolved by adding provider reporting requirements to §648.11(h)(vii) that would require the providers to define dates of when payments are considered overdue and define what constitutes an “unpaid payment” within their operations plans.

Rationale for rejection: The Scallop Committee did not support including this in FW22 because some did not support that permit sanctions should automatically be linked to payment issues. Furthermore, NMFS has determined that this action of updating the provider reporting requirements does not require Council action, as it is a provision that would allow OLE an avenue to investigate, pursue, and, if ultimately necessary, enforce the permit sanction provisions at §308(g) in the MSA as it pertains to unpaid observer services.

3.4 Change VMS positioning requirement for LAGC IFQ and LAGC incidental permits to once per hour

From a letter of correspondence it was explained that it costs $50 a month ($600 annually) to have 30 minute polling. And for an incidental LAGC permit 50 pounds a trip will not recoup that cost. This issue was raised during development of FW21 and was delayed until FW22 because it was raised too late in the process.

Rationale for rejection: Comments argued that VMS system is working and the Council should not be spending too much time on a minor issue. Savings from this proposed change are not that high, especially if they compromise enforcement capability. The scallop advisors felt that polling every 30 minutes works for existing closed area boundaries and any longer time between polling could leave room for violation.

3.5 Delay the opening date of Mid-Atlantic access areas for general category vessels

Mid-Atlantic access areas would open on May 1 rather than March 1 for general category vessels only.

Rationale for rejection: There was concern about this change combined with any turtle measures creating too small a window for the gen cat fleet to access these areas. The PDT added that this issue has come up in the past to promote fishing in better weather and months with higher meat weights, but may not be as necessary anymore. ETA is ending soon as an access area, derby fishing seems to be slowing down, and pushing the start date too far back could be problematic with current RPM measures to reduce impacts on sea turtles.

3.6 Split an incidental LAGC permit from other permits

This alternative would allow a vessel to sell their incidental LAGC permit to another vessel that does not have one.

Rationale for rejection: It was raised that this alternative may require a joint action and there were some concerns that it would conflict with intent of Amendment 11 and consistency with general permit splitting provisions.

3.7 Require modified turtle excluder dredge in Mid-Atlantic

The PDT discussed that there would be conservation benefits to requiring the modified turtle excluder dredge in the MA.

Rationale for rejection: This alternative was not ready for prime time. The PDT identified several issues that would need to be clarified first before it could be made standardized. While the PDT supported considering this measure, there was not sufficient time for it in this action. Instead, the PDT recommends that the Committee write a letter to NMFS arguing that RPM be modified to be gear based rather than effort based, and support including this in FW23.

3.8 Reduce trips in the great south channel access area in 2012 and 2013 if Alternative 3 is adopted, Section 2.4.1.4

The PDT discussed that the only automatic effort reduction measure necessary to be considered in this action is a reduction of trips for the Channel, if Alternative 3 is selected in Section 2.4.1.4. If updated biomass in 2011 shows that biomass in the Channel area is lower than projected the number of allocated trips in 2012 will be reduced. Similarly, if updated biomass estimates in 2012 find that biomass is lower than projected, allocated trips in 2013 will be reduced.

Rationale for rejection: This alternative was not further developed with specific biomass values that would trigger an automatic closure because Alternative 3 (Section 2.4.1.4) was no selected. Therefore, this measure was moved to the considered and rejected section.

4.0 DESCRIPTION OF AFFECTED ENVIRONMENT – SAFE REPORT

The environment affected by the sea scallop fishery as a whole is described in Section 4 of Amendment 11 to the Sea Scallop FMP (NEFMC, 2007). That description is incorporated herein by reference. This section serves as the 2010 SAFE Report, which updates the data and analysis of the fishery through the 2009 fishing year, including an updated assessment of the scallop resource and new analyses of limited access and general category scallop effort distribution.

4.1 THE ATLANTIC SEA SCALLOP RESOURCE

The Atlantic sea scallop, *Placopecten magellanicus* (Gmelin), is a bivalve mollusk ranging from North Carolina to the Gulf of St. Lawrence (Hart and Chute, 2004). Although all sea scallops in the US EEZ are managed as a single stock per Amendment 10, four regional components and six resource areas are recognized. Major aggregations occur in the Mid-Atlantic from Virginia to Long Island (Mid-Atlantic component), Georges Bank, the Great South Channel (South Channel component), and the Gulf of Maine (Hart and Rago, 2006; NEFSC, 2007). These four regional components are further divided into six resource areas: Delmarva (Mid-Atlantic), New York Bight (Mid-Atlantic), South Channel, southeast part of Georges Bank, northeast peak and northern part of Georges Bank, and the Gulf of Maine (NEFMC, 2007). Assessments focus on two main parts of the stock and fishery that contain the largest concentrations of sea scallops: Georges Bank and the Mid-Atlantic, which are combined to evaluate the status of the whole stock (NEFMC, 2007).

Sea scallops are generally found in waters less than 20^{o} C and depths that range from 30-110 m on Georges Bank, 20-80 m in the Mid-Atlantic, and less than 40 m in the near-shore waters of the Gulf of Maine. They feed by filtering zoo- and phytoplankton and detritus particles. Sea scallops have separate sexes, reach sexual maturity at age two, and use external fertilization. Scallops greater than 40 mm are considered mature individuals. Spawning generally occurs in late summer and early autumn, although there is evidence of spring spawning as well in the Mid-Atlantic Bight (DuPaul et al., 1989) and limited winter-early spring spawning on Georges Bank (Almeida et al., 1994; Dibacco et al., 1995). Annual fecundity increases rapidly with shell height; individuals younger than four years may contribute little to total egg production (MacDonald and Thompson, 1985; NEFMC, 1993; NEFSC, 2007). The pelagic larval stage lasts 4-7 weeks with settlement usually on firm sand, gravel, shells, etc. (Hart and Chute, 2004; NEFMC, 2007; NEFSC, 2007). Recruitment to the NEFSC survey occurs at 40 mm shell height (SH) and to the commercial fishery at 90-105mm SH, which corresponds to an age of 4-5 years old (NEFSC, 2007; NEFMC, 2007).

Meat weight can quadruple between the ages of three to five (NEFSC, 2004; NEFMC, 2007). Meat weight is dependent on shell size, which increases with age, and depth. Meat weight decreases with depth, possibly due to a reduced food supply (NEFSC, 2007). Both the Mid-Atlantic and Georges Bank showed a drop in meat weights between August and October, coinciding with the September-October spawning period (Haynes, 1966; Serchuk and Smolowitz, 1989; NEFSC, 2007). Meat weight of landed scallops may differ from those predicted based on research survey data because: 1) the shell height/meat weight relationship varies seasonally in part because of the reproductive cycle, causing meats collected during the NEFSC survey to differ from the rest of the year; 2) commercial fishers concentrate on speed while shucking, leaving some meat on the shell (Naidu, 1987; Kirkley and DuPaul, 1989); and 3) fishers may target areas with relatively large meat weight at shell height, thus increasing commercial weights compared to those seen on the research survey vessel (NEFSC, 2007).

4.1.1 Assessment

The primary source of data used in the biological component of the scallop assessment currently comes from the federal scallop survey. The scallop dredge survey has been conducted in a consistent manner since 1979. An 8-foot modified scallop dredge is used with 2" rings and a 1.5" liner. Tows are 15 minutes in length at a speed of 3.8 knots, and stations are identified using a random-stratified design. About 500 stations are completed each year on Georges Bank and the Mid-Atlantic (which are assessed separately). The vessel platform used in the past (R/V Albatross IV) went out of service in 2008. The 2008, 2009 and 2010 resource surveys were conducted on the R/V Hugh Sharp owned by the University of Delaware. The 2009 and 2010 surveys were conducted six weeks earlier than previous surveys in hopes that the data would be available in time for management actions being developed and voted on in the fall. Calibration tows have been conducted with the WHOI HabCam in order to use this video survey in future projections, and to determine a dredge efficiency value. In addition, paired tows were conducted with the Albatross IV and the Hugh Sharp in order to determine if an adjustment should be made between data from the different platforms. A Scallop Survey Advisory Panel (SSAP) is reviewing the scallop survey and making recommendations about how future surveys should be conducted.

Other components of the assessment include defining parameters for scallop growth, maturity and fecundity, shell height/meat weight relationships, recruitment, and estimates of natural mortality, which are all combined with fishery data (landings and discards) to estimate fishing mortality rates and biological reference points. The per-recruit reference points F_{max} and B_{max} have been used by managers as proxies for F_{msy} and B_{msy} in the past because the stock-recruitment relationship is not well defined. The Catch-At-Size-Analysis (CASA) model utilizes additional information including commercial catch, LPUE, commercial shell height compositions, data from the NMFS sea scallop and winter trawl surveys, data from the University of Massachusetts Dartmouth School of Marine Science and Technology (SMAST) small camera video surveys, data from dredge surveys conducted by VIMS, growth increment data from scallop shells, and shell height/meat weight data adjusted to take commercial practices and seasonality into account (NEFSC, 2007).

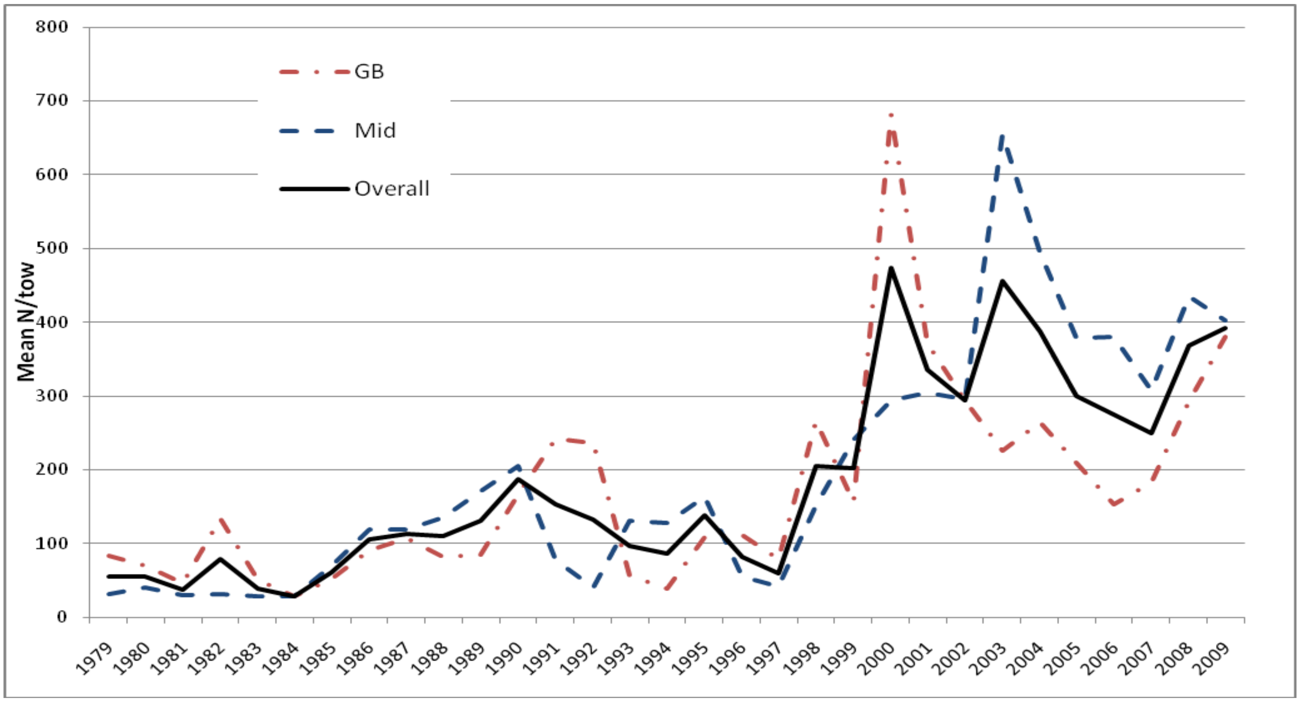
Some changes were made to the CASA model input in the latest stock assessment (NEFSC, 2010). First, updated values of natural and incidental mortality by stock area were estimated. Natural mortality for Georges Bank was estimated at 0.12, and the Mid-Atlantic was slightly higher at 0.15. Incidental mortality values for GB and MA were 0.2 and 0.1, respectively. These adjustments to the model decrease the production potential of the stock and will likely result in less (over)optimistic projections, which could potentially help to keep projected and actual fishing mortality closer than in recent years. Second, selectivity values were updated because the fishery has become more selective in recent years. Because of the change in selectivity over time, F values mean different things at different times and there is a lack of "common currency." There is the potential to recalculate F over these different time periods to improve comparison with exploitation indices based on #caught/abundance >80mm (NEFSC, 2010).

Based on the results of the latest stock assessment workshop (SAW 50, June 2010), F_{max} is highly uncertain in the Mid-Atlantic, and no longer makes sense to use as a proxy. GB is slightly better, but the assessment working group still moved to use MSY. Currently, the stock is above B_{MSY}, and well above overfishing threshold of ½ B_{MSY} (not overfished). Combined stock F in 2009 (0.378) is essentially equal to the new F_{MSY} reference point (0.38) estimated from the Stochastic Yield Model (SYM), but it must be over the reference point for overfishing to be occurring. The probability that overfishing was occurring in 2009 was just under 50%, so reduced allocations are expected in 2011 and possibly 2012 compared to 2009. It is also expected that 2010 F will be higher than the 0.24 target.

The updated assessment results suggest it is likely that keeping Mid-Atlantic biomass high may help to keep long term MSY higher. In addition, the retrospective pattern seen in the Mid-Atlantic suggests that 10-20% of mortality there is unaccounted for. Finally, there was poor recruitment in 2009 and probably 2010 in Mid-Atlantic. GB recruitment appears cyclical, and we have seen good recruitment in recent years and thus should expect a drop-off.

Combined model-estimated scallop biomass increased dramatically in the decade following 1994. Estimates have fluctuated in the years since, but have remained higher than pre-closure levels (NEFSC, 2010). Figure 9 shows the trends in terms of estimated Mid-Atlantic, Georges Bank and total scallop abundance based on the scallop survey through 2009. These values are unadjusted; therefore cannot be directly compared to biomass thresholds, but the general increasing trend from the late 90s-early 00s in both areas is evident, along with the fluctuations in more recent years. Georges Bank numbers have been increasing over the last five years, and the Mid-Atlantic has fluctuated, with a slight decrease in the most recent year of data. In terms of this abundance index, the two stocks were very close in 2009.

Figure 9 - Trend in NEFSC survey stratified mean number per tow from mid 1980s through 2009 by region and overall.



4.1.2 Northern Gulf of Maine

A biomass estimate for the Northern Gulf of Maine (NGOM) federal scallop resource was calculated and included as an appendix in the SAW 50 report (NEFSC, 2010). A biomass estimate is included (from a 2009 offshore survey in federal waters) which was used to calculate a more informed TAC. The NGOM survey observed what appears to be a large recruitment event on Platts bank, and this was also seen by the SMAST video survey. Density in this area was as high as 60 scallops m^{-2} in some areas, and averaged 4.70 scallops m^{-2} for all of Platts Bank with 97% of shell heights less than 55 mm (Stokesbury, et. al, 2010). This recruitment event has the potential to provide an important commercial resource in the future. It was not clear why so few adult scallops were seen in this area, but explanations range from sporadic recruitment, high natural mortality from predation, and/ or environmental influences (Stokesbury, et. al, 2010).

4.1.3 Stock Status

Stock status has been fluctuating in recent years. Overall biomass increased almost without interruption since 1997, peaking at 8.2 kg/tow in 2004. Fishing mortality was above the threshold of 0.24 and target of 0.20 for both 2003 and 2004 with both years at or above 0.30. For 2005, 2006, and 2007, fishing mortality was reduced to 0.22, 0.20, and 0.20 respectively, staying below the threshold value. Results from the 2010 stock assessment suggest that *F* has increased again in both 2008 and 2009, as discussed below. This assessment also recommended new stochastic MSY reference points as follows: F_{msy} = 0.38 and B_{msy} = 125,358 mt.

According to the CASA model, total biomass in 2009 was 129,703 mt meats, which is above the estimated B_{msy}. Therefore, the sea scallop fishery was not overfished in 2009. The probability the stock was below the 1/2 *B*MSY biomass threshold is < 0.0001, regardless of which biomass reference point is used.

The estimate of *F* in 2008 for the MA is 0.38 and for GB it is 0.18, with an overall *F* of 0.28. The 2009 *F* in the MA was 0.38 (to three decimal places 0.378), which is above the previous (NEFSC 2007) overfishing threshold of 0.29 and its updated value of 0.30, but equal to the newly recommended (in 2010) *F*MSY = 0.38. Therefore, overfishing was not occurring in 2009 based on the new recommended overfishing definition.

Both estimates of fishing mortality for 2008 and 2009 were substantially higher than the F_{target} of 0.20 from FW19. This is likely to due to several factors, most notably an increase in (or underestimation of) LPUE in open areas. While we expect estimates of fishing mortality to be closer to the target in the future, it is notable that realized F has been above target F for several years.

The status of the resource has not been officially updated since the 2009 estimates summarized above, but the PDT did evaluate where things are for this action. FY2010 is not over yet, and estimates for this year are still preliminary, but the Council considered them when making decisions in this action. Landings are expected to be over 55-56 million pounds in FY2010. The estimate of fishing mortality for FY2010 is 0.35, with an updated estimate of LPUE of 2,200; rather than the 1,700 pounds per day used in FW21 to set specifications. An overall F of 0.35 is below the overfishing threshold of 0.38, but above the target set for the fishery.

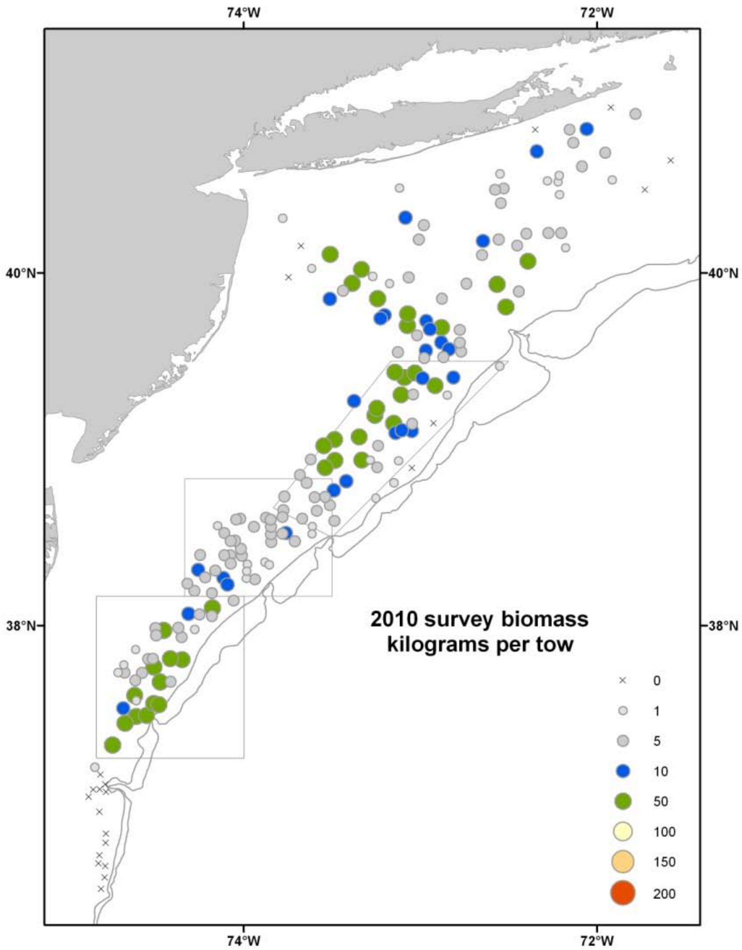
4.1.3.1 Biomass

Despite a decline in biomass in the past few years, the overall trend shows a considerable increase since 1994, especially in the Georges Bank closed areas (NEFSC, 2007). Scallop biomass on Georges Bank has increased by a factor of 18 and in the Mid-Atlantic Bight by a factor of 8 (Hart and Rago, 2006), which is likely due to very strong recruitment in the Mid-Atlantic and improved management in both the Mid-Atlantic and Georges Bank (NEFMC, 2007). The resource remains in relatively good condition even though mortality was above target for 2003-2004 and 2008-2009 with a greater share of the landings coming from older and larger scallops. Whole-stock estimates indicate that annual abundance, annual egg production, and biomass were relatively high during 2009, with recruitment relatively low.

Biomass increased rapidly in the Mid-Atlantic Bight from 1998-2003 due to area closures, reduced fishing mortality, changes in fishery selectivity, and strong recruitment. Biomass in the Hudson Canyon area increased while it was closed from 1998-2001; likewise, biomass increased steadily in the ETA after its closure in 2004. Two very strong year classes were protected by the ETA closure, which contained over one-quarter of the total scallop biomass in 2007. Heavy fishing effort in the area since has decreased biomass there (NEFMC 2010).

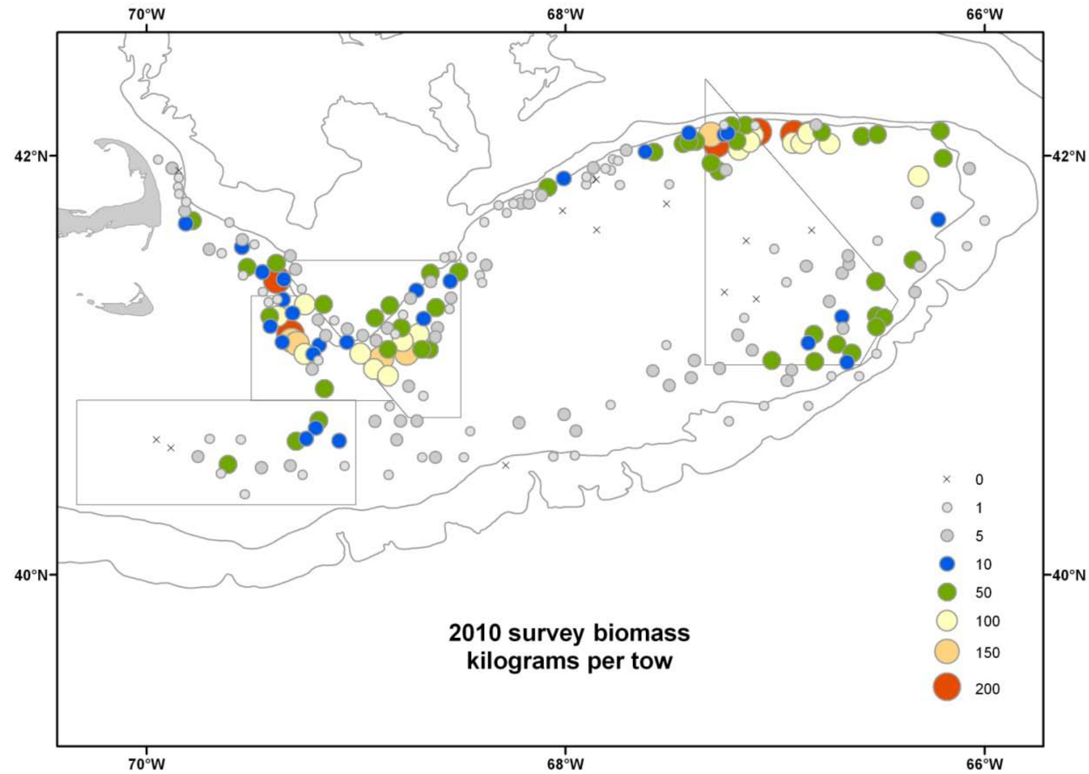
In general the 2010 Mid-Atlantic biomass is down from 2009, mainly from the depletion of Elephant Trunk. Figure 2 shows the biomass in the Mid Atlantic based on the 2010 NMFS scallop survey, with largest densities in the Hudson Canyon and Delmarva closed areas, and notably high biomass in a few areas south of Long Island.

Figure 10. Biomass chart for the Mid-Atlantic from the 2010 NMFS sea scallop survey



The scallop abundance and biomass on Georges Bank increased from 1995-2000 after implementation of closures and effort reduction measures. Biomass and abundance then declined from 2006-2008 because of poor recruitment and the reopening of portions of groundfish closed areas. 2009 saw an increase in biomass on Georges Bank and survey estimates in 2010 follow suit. This increase is mainly due to high growth rates and strong recruitment in the Great South Channel, along with continuing concentrations on the Northern Edge and in the central portion of Closed Area I, especially just south of the "sliver" access area. The highest concentrations of biomass on Georges Bank are currently on the Northern Edge, within Closed Area I, and within the Nantucket Lightship closed area (Figure 11). A large portion of the biomass is in the South Channel area proposed for a one-year closure in this framework.

Figure 11. Biomass chart for Georges Bank from the 2010 NMFS sea scallop survey



4.1.3.2 Recruitment

Continued strong recruitment was observed on Georges Bank in 2010 (2009 year class), especially in the South Channel, on the Northern Edge, and in a small area of the Southeast part of CA II (Figure 12). Recruitment in the Mid-Atlantic was poor following a good year class in 2008, and extremely spatially limited. Most areas of recruitment were observed in the open area on the south rim of Hudson Canyon, with a few small pockets in the Hudson Canyon closed area and Elephant Trunk (Figure 13). Looking at trends for both portions of the scallop stock (Figure 14 and Figure 15) there is a strong recruitment pattern in place currently for Georges Bank, with three high years in a row. The drop-off in the Mid-Atlantic is somewhat drastic, but not inconsistent with the variable pattern shown by the stock of several strong years followed by a drop-off and recovery.

Figure 12 – Recruitment on Georges Bank from 2010 NMFS scallop survey

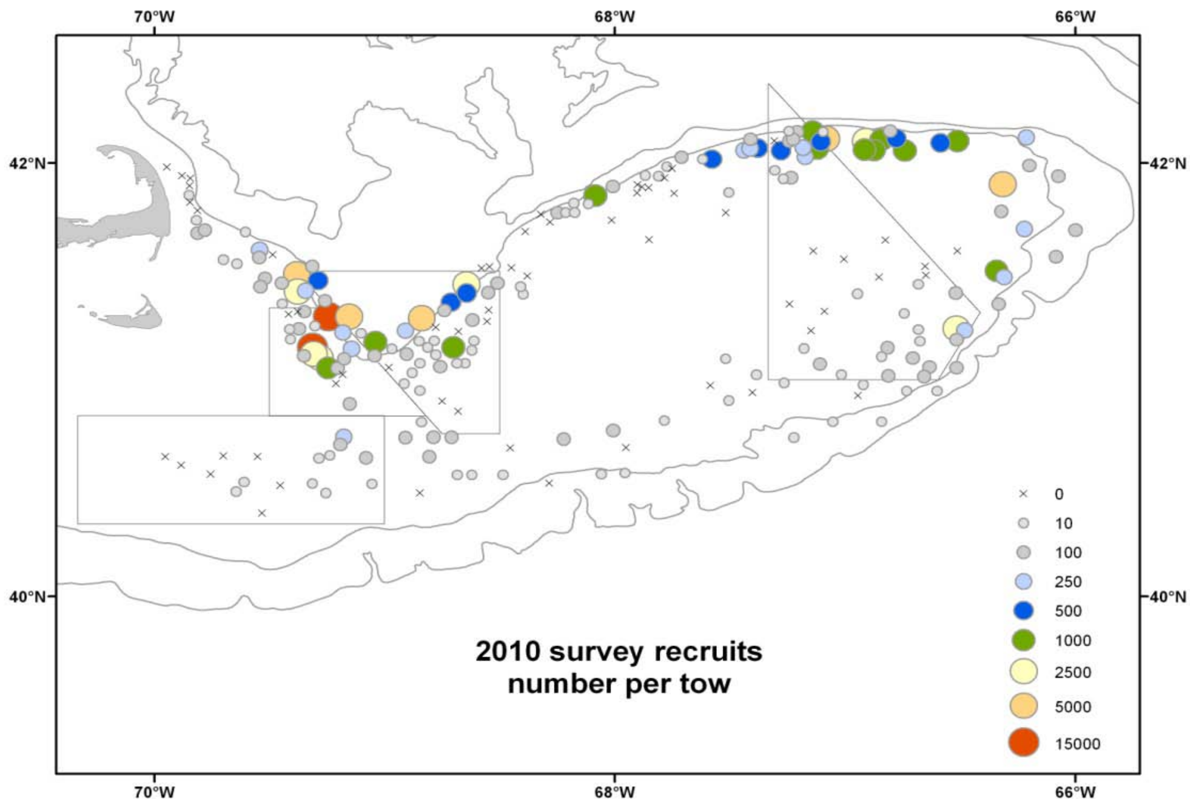


Figure 13 - Recruitment in the Mid-Atlantic from the 2010 NMFS scallop survey

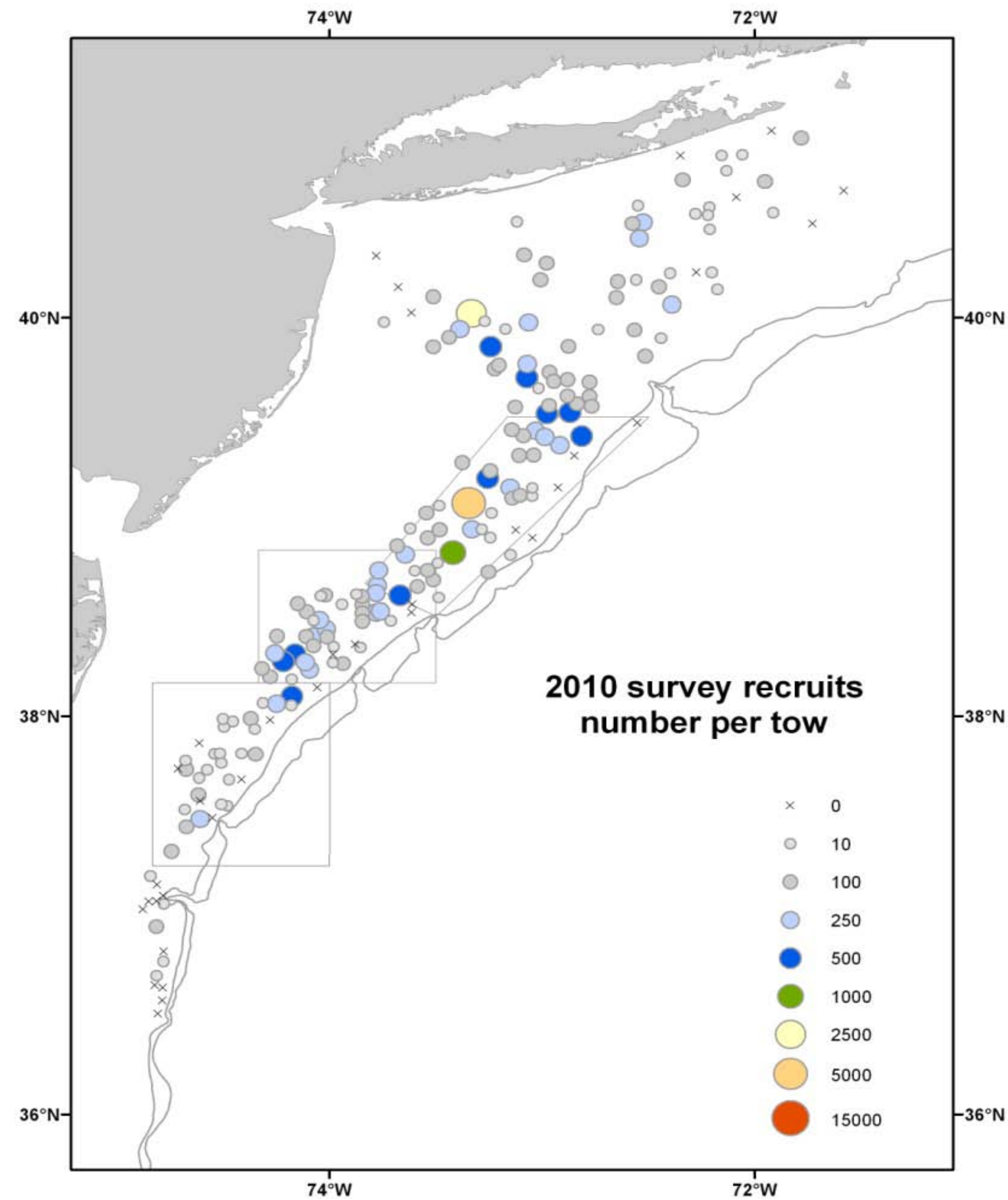


Figure 14 - Recruitment patterns on Georges Bank

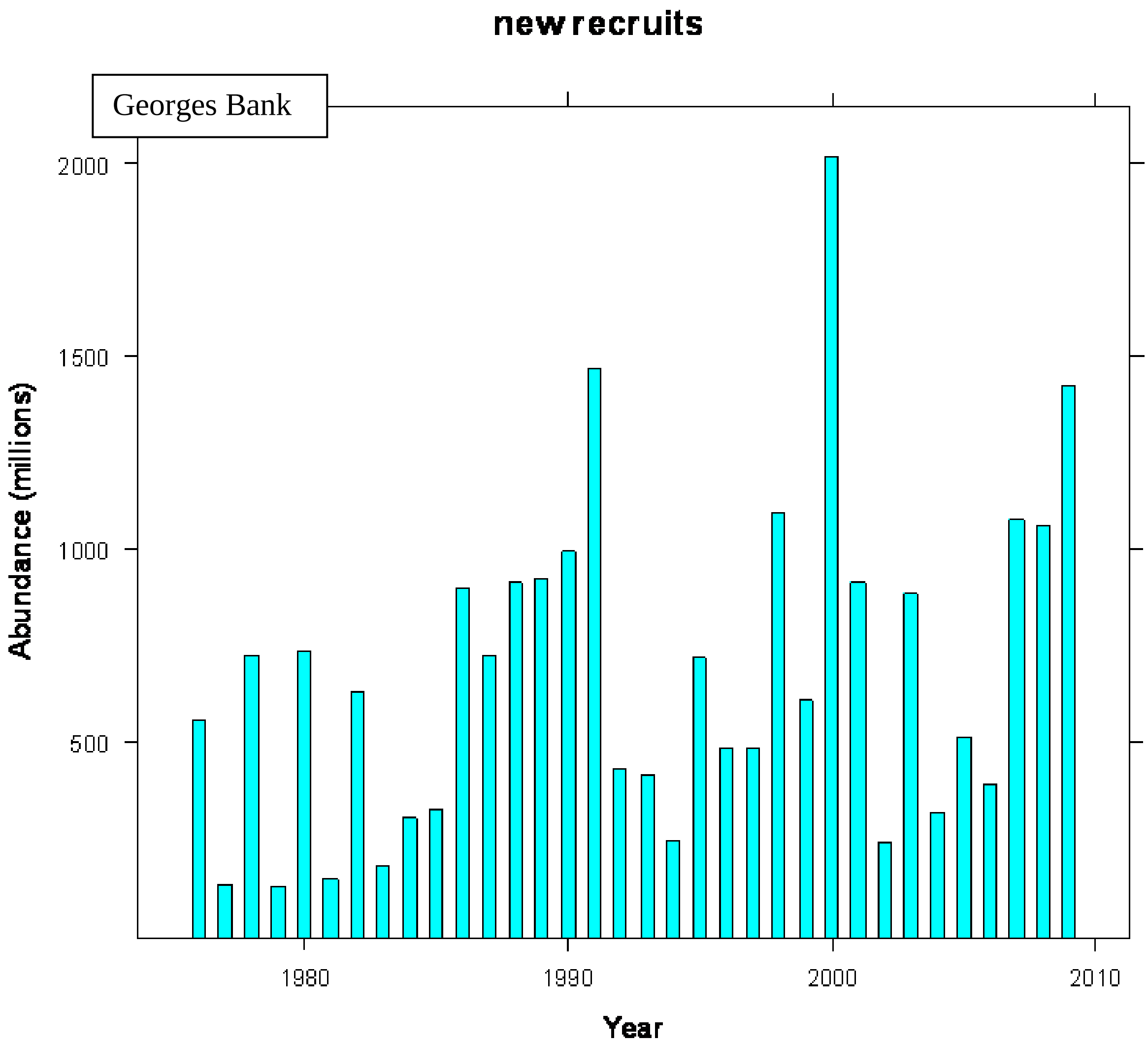


Figure 15 - Recruitment patterns in the Mid-Atlantic

4.1.3.3 Mortality

Four types of mortality are accounted for in the assessment: natural, discard, incidental, and fishing mortality. In the past, the natural mortality rate was assumed to be $M = 0.1y^{-1}$ for scallops with shell heights greater than 40 mm based on estimates of *M* from ratios of clappers (still-intact shells from dead scallops) to live scallops (Merrill and Posgay, 1964). It is known that natural mortality may increase at larger shell heights (MacDonald and Thompson, 1986; NEFSC, 2007). The updated stock assessment established new values for natural mortality on both stocks. The new estimates are M = 0.12 for Georges Bank, and M = 0.15 for the Mid-Atlantic (NEFSC, 2010).

Discard mortality occurs when scallops are discarded on directed scallop trips because they are too small to be economically profitable to shuck or due to high-grading during access area trips to previously-closed areas. Discard ratios were low during the 2005-2006 season, probably because of new gear regulations (4" rings). Scallops can also be caught as bycatch and either landed or discarded in other fisheries. Trawl fisheries with the largest scallop bycatch for 1994-2006 were longfin squid, summer flounder, yellowtail, haddock, cod, and monkfish. From 1994-2006, an estimated mean of 94 mt meats of scallops were landed and 68 mt meats were discarded per year as bycatch in other fisheries. Total discard mortality is estimated at 20% (NEFSC, 2007).

Incidental mortality is non-landed mortality associated with scallop dredges that likely kill and injure some scallops that are contacted but not caught by crushing their shells. Caddy (1973) estimated 15-20% of the scallops remaining in the dredge track were killed, while Murawski and Serchuk (1989) estimated that <5% were killed. The difference could be due to differences in substrate; the first study was done in a hard bottom area, while the subsequent study was in an area with a sandy bottom. Incidental mortality values were also updated in this assessment. The new values are 0.20 on Georges Bank and 0.10 in the Mid-Atlantic (NEFSC, 2010). The prior assessment (SAW 45) assumed 0.15 F_L in Georges Bank and 0.04 F_L in the Mid-Atlantic (NEFSC, 2007).

The increase in assumed values for both natural and incidental mortality is expected to reduce the productivity potential of the stock, which is likely to cause the model to produce less (over) optimistic projections. The optimistic projections seen in the past have manifest in a retrospective pattern particularly evident in the Mid-Atlantic, and the SAW concluded that this indicates that about 10-20% of the mortality there is unaccounted for. Adjusting the previously-mentioned mortality assumptions upward should help to deal with this problem.

Fishing mortality, the mortality associated with scallop landings on directed scallop trips, was calculated separately for Georges Bank and the Mid-Atlantic because of differences in growth rates. For comparison to biological reference points used to identify overfishing and overfished stock conditions, a whole-stock estimate of fishing mortality is also necessary. Fishing mortality peaked for both stocks in the early 1990s, but has decreased substantially since then, as tighter regulations were put into place including area closures, and biomass levels recovered. In general, F has remained stable on Georges Bank since 1995, and the Mid-Atlantic has shown larger fluctuations and an overall higher F (Figure 16).

Combined fishing mortality declined steadily from 1991-1998, and has remained relatively steady in the years since (Figure 17). The formal stock status update was prepared through FY2009 as part of SARC 50 (NEFSC, 2010), and the F_{max} reference point was changed to F_{msy} as mentioned earlier. F_{msy} for the whole stock was estimated from the Stochastic Yield Model (SYM) to be 0.38 (F_{max} from SAW 45 was 0.29). SARC 50 estimated that overall fishing mortality in 2009 was 0.38, consistent with recent years. Since the fishing mortality in 2009 was equal to F_{msy}, overfishing did not occur (F must be above the threshold). Using the "traffic light" approach, fishing mortality for the whole sea scallop stock has a yellow light.

Figure 16 - Fishing mortality (red line) and biomass estimates (y^{-1}, gray bars) from the CASA model for scallops on Georges Bank (right) and in the Mid-Atlantic (left), through 2009

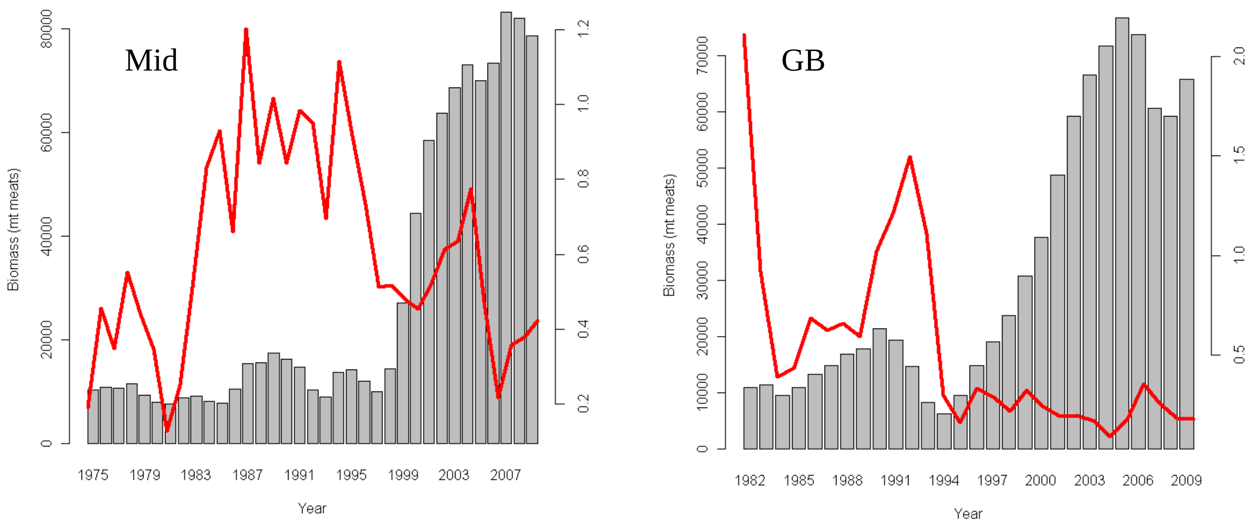
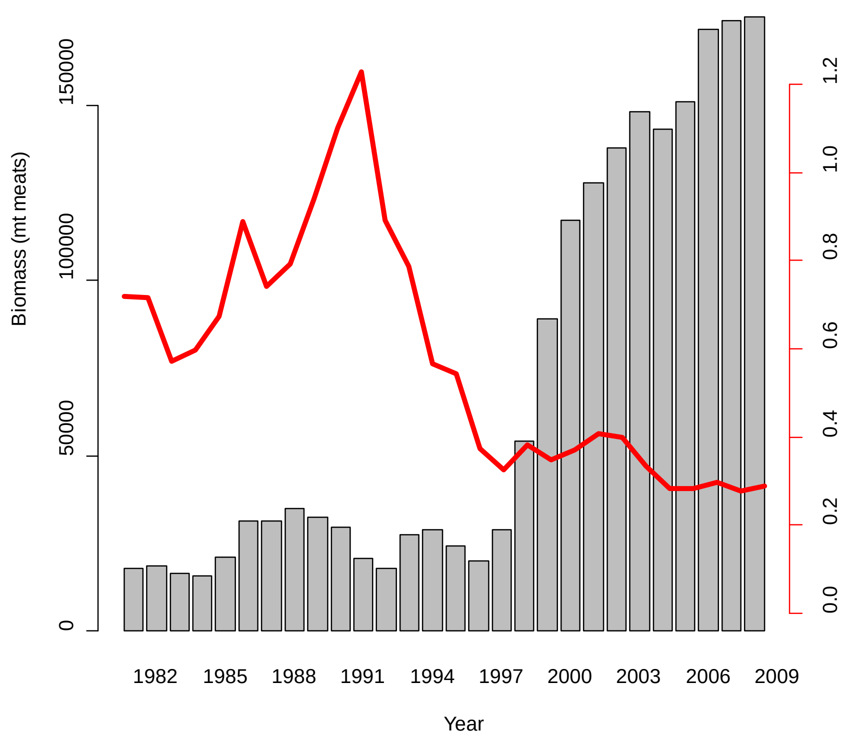


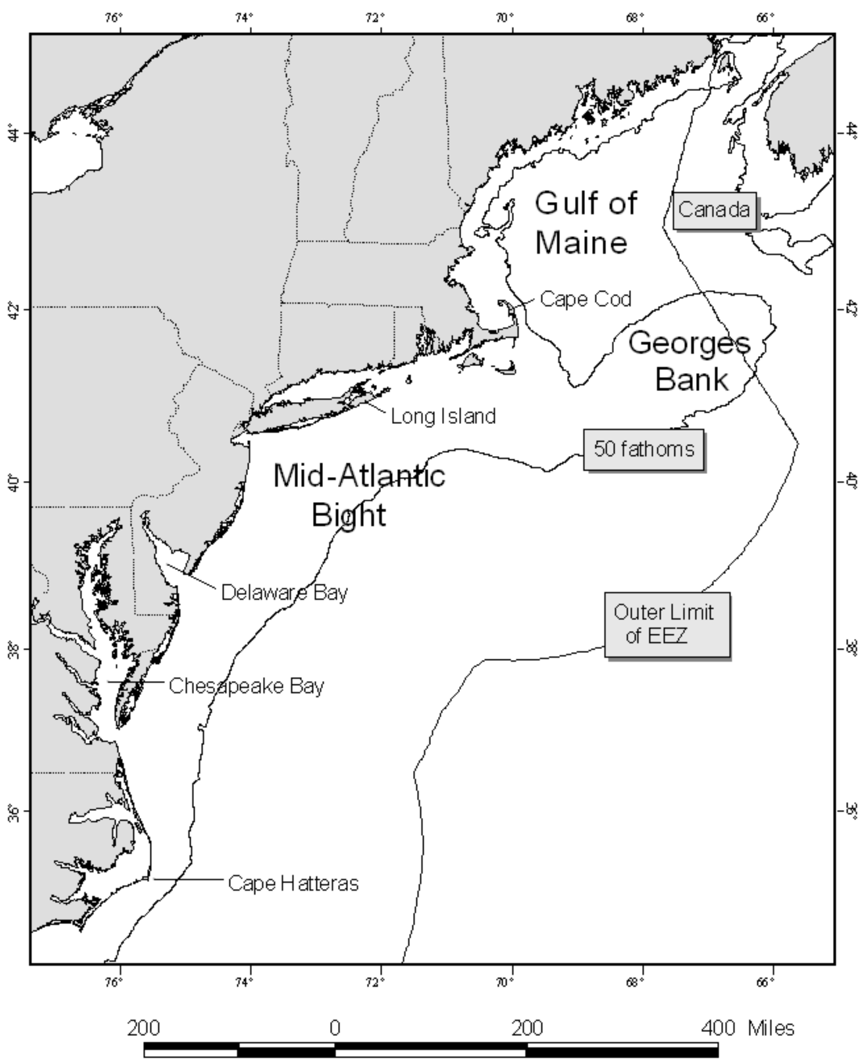
Figure 17 - Fishing mortality (red line) and biomass estimates (y^{-1}, gray bars) from the CASA model for sea scallop resource overall (Georges Bank and Mid-Atlantic combined) through 2009



4.2 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Northeast U.S. Shelf Ecosystem includes 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 to a depth of 2,000 m (Figure 18**,** Sherman et al. 1996). Four distinct sub-regions are identified: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. The physical oceanography and biota of these regions were described in the Scallop Amendment 11. Much of this information was extracted from Stevenson et al. (2004), and the reader is referred to this document and sources referenced therein for additional information. These sources included, among others: Abernathy 1989; Backus 1987; Beardsley et al. 1996; Brooks 1996; Cook 1988; Mountain 1994; Reid and Steimle 1988; Schmitz et al. 1987; Sherman et al. 1996; Stumpf and Biggs 1988; Townsend 1992; and Wiebe et al. 1987. Primarily relevant to the scallop fishery are Georges Bank and the Mid-Atlantic Bight, although some fishing also occurs in the Gulf of Maine.

Figure 18 – Northeast U.S Shelf Ecosystem.



The Atlantic sea scallop fishery is prosecuted in concentrated areas in and around Georges Bank and off the Mid-Atlantic coast, in waters extending from the near-coast out to the continental shelf (Figure 19). This area, which could potentially be affected by the proposed action, has been identified as EFH for various species (Table 27). Most of the current EFH designations were developed in NEFMC Essential Fish Habitat Omnibus Amendment 1 (1998). Most recently, Amendment 16 to the Northeast Multispecies FMP adds Atlantic wolffish to the management unit and includes an EFH designation for the species. For additional information, the reader is referred to the Omnibus Amendment and the other FMP documents listed in Table 28. In addition, summaries of EFH descriptions and maps for Northeast region species can be accessed at http://www.nero.noaa.gov/hcd/webintro.html. Designations for all species are being reviewed and updated in NEFMC Essential Fish Habitat Omnibus Amendment 2.

Figure 19 – Geographic extent of the Atlantic sea scallop fishery

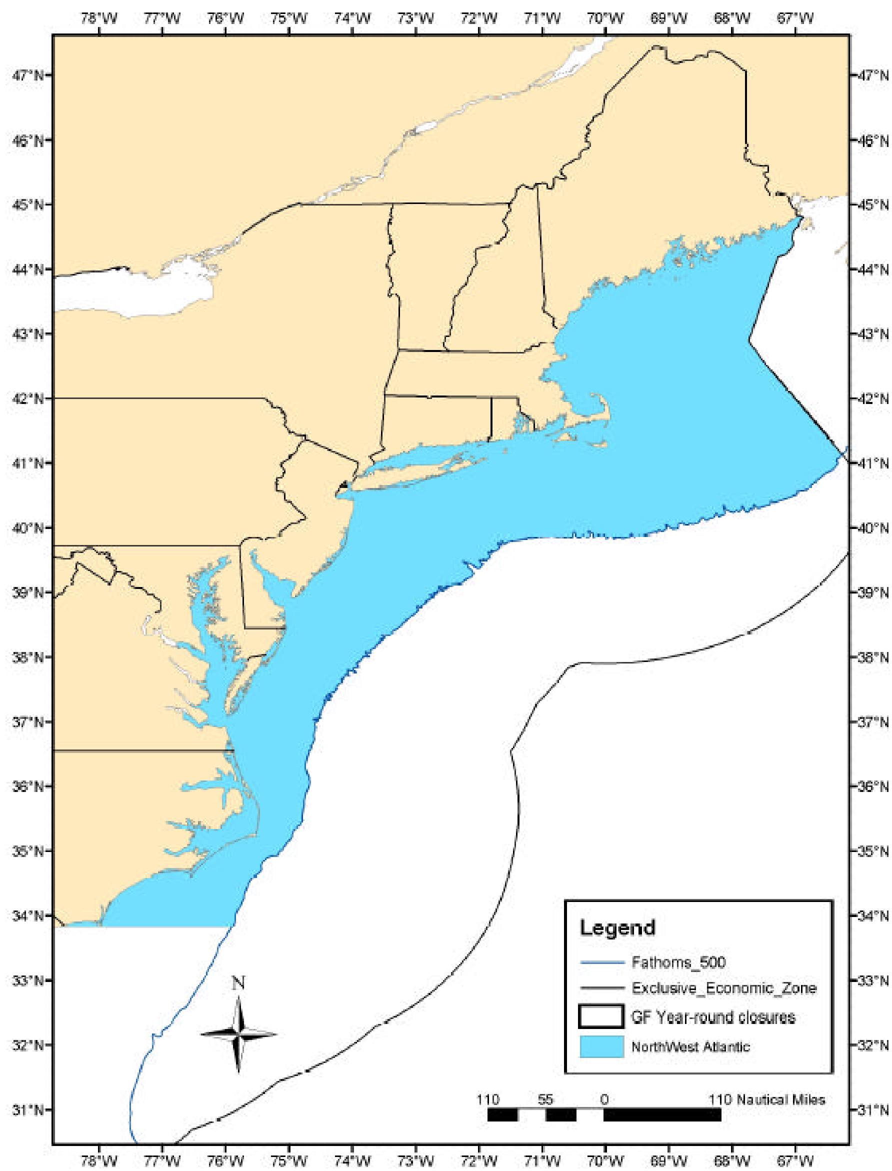


Table 27 Designated EFH that overlaps with the Atlantic sea scallop fishery, listed by managed species and lifestage.

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
American plaice	juvenile	GOM and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45-150	Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOM and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45-175	Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25-75	Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10-150	Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOM, GB	20-60	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOM, Georges Bank	100-700	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic herring	eggs	GOM, GB and following estuaries: Englishman/Machias Bay, Casco Bay, and Cape Cod Bay	20-80	Bottom habitats attached to gravel, sand, cobble or shell fragments, also on macrophytes
Atlantic herring	juvenile	GOM, GB and following estuaries: Englishman/Machias Bay, Casco Bay, and Cape Cod Bay	15-135	Pelagic waters and bottom habitats
Atlantic herring	adult	Pelagic waters and bottom habitats	20-130	Pelagic waters and bottom habitats
Atlantic sea scallop	eggs	GOM, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	n/a	Bottom habitats
Atlantic sea scallop	larvae	GOM, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	n/a	Pelagic waters and bottom habitats with a substrate of gravelly sand, shell fragments, pebbles, or on various red algae, hydroids, amphipod tubes, and bryozoans.
Atlantic sea scallop	juvenile	GOM, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18-110	Bottom habitats with a substrate of cobble, shells, and silt

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
Atlantic sea scallop	adult	GOM, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18-110	Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Atlantic surfclam	juvenile	Eastern edge of GB and the GOM throughout Atlantic EEZ	0-60, low density beyond 38	Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOM throughout Atlantic EEZ	0-60, low density beyond 38	Throughout substrate to a depth of 3 ft within federal waters
Atlantic wolfish	all life stages			
Barndoor skate	juvenile	Eastern GOM, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0-750, mostly <150	Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOM, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	l0-750, mostly <150	Bottom habitats with mud, gravel, and sand substrates
Black sea bass	juvenile	Demersal waters over continental shelf from GOM to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1-38	Rough bottom, shellfish and eelgrass beds, manmade structures in sand-shell areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOM to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20-50	Structured habitats (natural and manmade), sand and shell substrates preferred
Clearnose skate	juvenile	GOM, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0–500, mostly <111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOM, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0–500, mostly <111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Haddock	juvenile	GB, GOM, middle Atlantic south to Delaware Bay	35-100	Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOM, *additional area of Nantucket Shoals, and Great South Channel	40-150	Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-137, mostly 73-91	Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-137, mostly 73-91	Bottom habitats with sandy or gravelly substrate or mud
Longfin squid	eggs	GB, southern NE and middle Atlantic to mouth of Chesapeake Bay	<50	Egg masses attached to rocks, boulders and vegetation on sand or mud bottom
Monkfish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOM	25-200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Monkfish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of Gulf of Maine	25-200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	eggs	GOM, GB, southern NE, and middle Atlantic south to Delaware Bay, and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts and Cape Cod Bay	<50	Bottom habitats, generally in hard bottom sheltered nests, holes, or crevices
Ocean pout	larvae	GOM, GB, southern NE, and middle Atlantic south to Delaware Bay, and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts and Cape Cod Bay	<50	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	juvenile	GOM, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	<80	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	<110	Bottom habitats, often smooth bottom near rocks or algae
Ocean quahog	juvenile	Eastern edge of GB and GOM throughout the Atlantic EEZ	8-245	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Ocean quahog	adult	Eastern edge of GB and GOM throughout the Atlantic EEZ	8-245	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Pollock	juvenile	GOM, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 – 250	Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
Pollock	adult	GOM, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	<100	Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10-130	Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOM, southern edge of GB	25-400	Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50-350	Bottom habitats with a substrate of silt, mud, or hard bottom
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, mostly 74-274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33-530, mostly 74-274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Scup	juvenile	Continental shelf from GOM to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	0-38	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOM to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./ Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	2-185	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Silver hake	juvenile	GOM, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20-270	Bottom habitats of all substrate types
Silver hake	adult	GOM, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30-325	Bottom habitats of all substrate types

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
Smooth skate	juvenile	Offshore banks of GOM	31–874, mostly 110-457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOM	31–874, mostly 110-457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Summer flounder	juvenile	Over continental shelf from GOM to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5–5 in estuary	Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds
Summer flounder	adult	Over continental shelf from GOM to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0-25	Demersal waters and estuaries
Thorny skate	juvenile	GOM and Georges Bank	18-2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOM and GB	18-2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76-365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76-365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
White hake	juvenile	GOM, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5-225	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand
White hake	adult	GOM, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5-325	Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	juvenile	GOM, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1-100	Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	adult	GOM, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1-75	Bottom habitats with substrate of mud or fine grained sand

Species	*Life stage*	*Geographic area*	*Depth (m)*	*EFH Description*
Winter flounder	eggs	GB, inshore areas of GOM, southern NE, and middle Atlantic south to Delaware Bay	<5	Bottom habitats with a substrate of sand, muddy sand, mud, and gravel
Winter flounder	juvenile	GB, inshore areas of GOM, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1–10 (1 - 50, age 1+)	Bottom habitats with a substrate of mud or fine grained sand
Winter flounder	adult	GB, inshore areas of GOM, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1-100	Bottom habitats including estuaries with substrates of mud, sand, grave
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0-371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50-450 to 1500	Bottom habitats with fine grained substrate
Witch flounder	adult	GOM, outer continental shelf from GB south to Chesapeake Bay	25-300	Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOM, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20-50	Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOM, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20-50	Bottom habitats with substrate of sand or sand and mud

Table 28 – Listing of sources for original EFH designation information

Species	*Management authority*	*Plan managed under*	*EFH designation action*
American plaice	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic cod	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic halibut	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Atlantic herring	NEFMC	Atlantic Herring	EFH Omnibus/Atlantic Herring FMP
Atlantic sea scallop	NEFMC	Atlantic Sea Scallop	EFH Omnibus/Atlantic Sea Scallop A9
Atlantic surfclam	MAFMC	Atlantic Surfclam Ocean Quahog	Atlantic Surfclam Ocean Quahog A12
Barndoor skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Black sea bass	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12

Species	*Management authority*	*Plan managed under*	*EFH designation action*
Clearnose skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Haddock	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Little skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Longfin squid	MAFMC	Atlantic Mackerel, Squid, and Butterfish	Atlantic Mackerel, Squid, and Butterfish A8
Monkfish	NEFMC, MAFMC	Monkfish	EFH Omnibus/Monkfish A1
Ocean pout	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Ocean quahog	MAFMC	Atlantic Surfclam Ocean Quahog	Atlantic Surfclam Ocean Quahog A12
Pollock	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Red hake	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Redfish	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Rosette skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Scup	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12
Silver hake	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Smooth skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Summer flounder	MAFMC	Summer Flounder, Scup, and Black Sea Bass	Summer Flounder, Scup, and Black Sea Bass A12
Thorny skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Tilefish	MAFMC	Tilefish	Tilefish FMP
White hake	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Windowpane flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Winter flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Winter skate	NEFMC	NE Skate Complex	Original NE Skate Complex FMP
Witch flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11
Yellowtail flounder	NEFMC	NE Multispecies	EFH Omnibus/NE Multispecies A11

Among other measures, this action proposes to eliminate the Scallop Amendment 10 EFH closures. The following four maps describe aspects of the seabed environment in those areas, including the dominant substrate and energy regime.

Figure 20 – Substrate composition and environmental energy in Western Gulf of Maine Closed Area

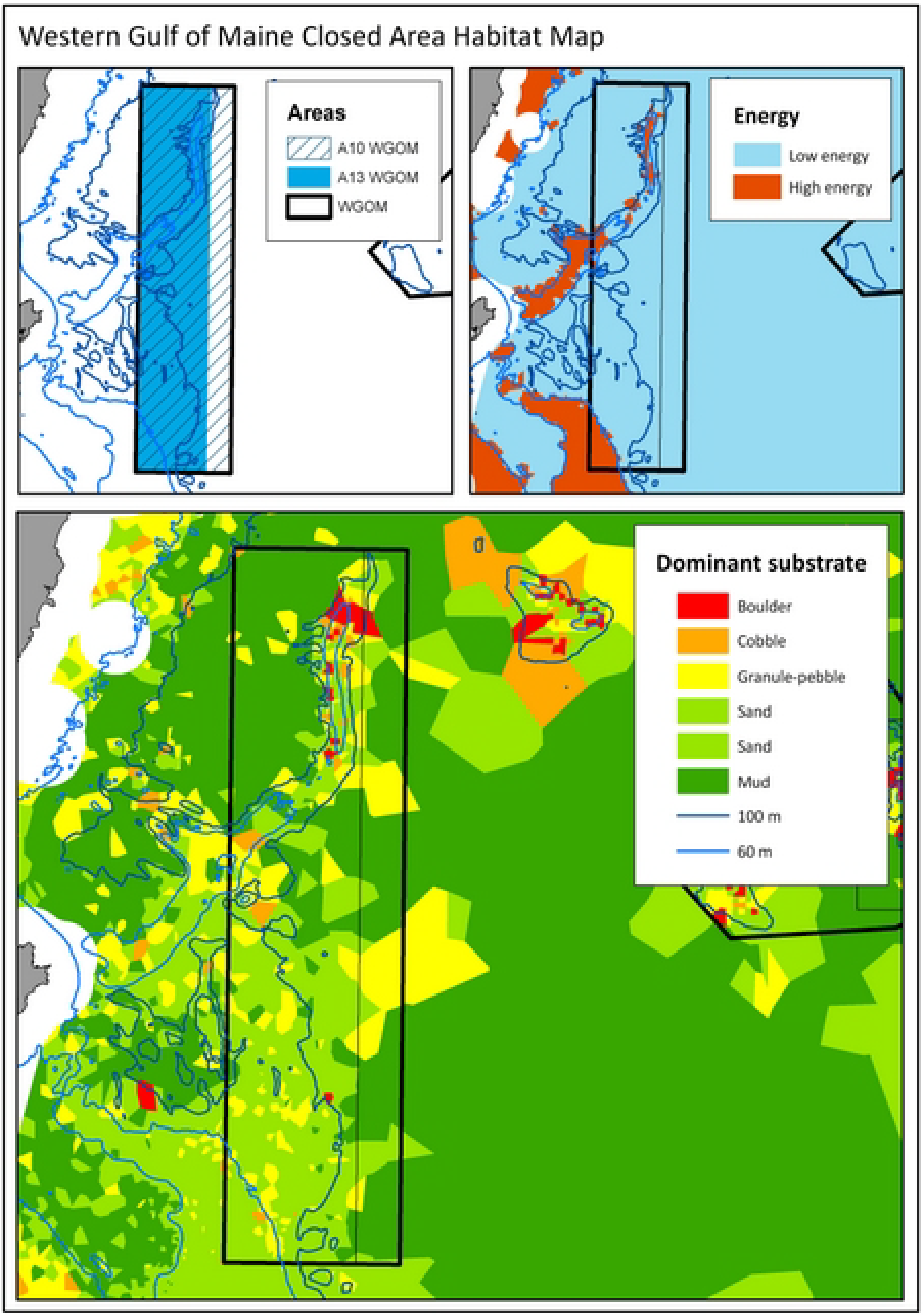


Figure 21 – Substrate composition and environmental energy in Nantucket Lightship Closed Area

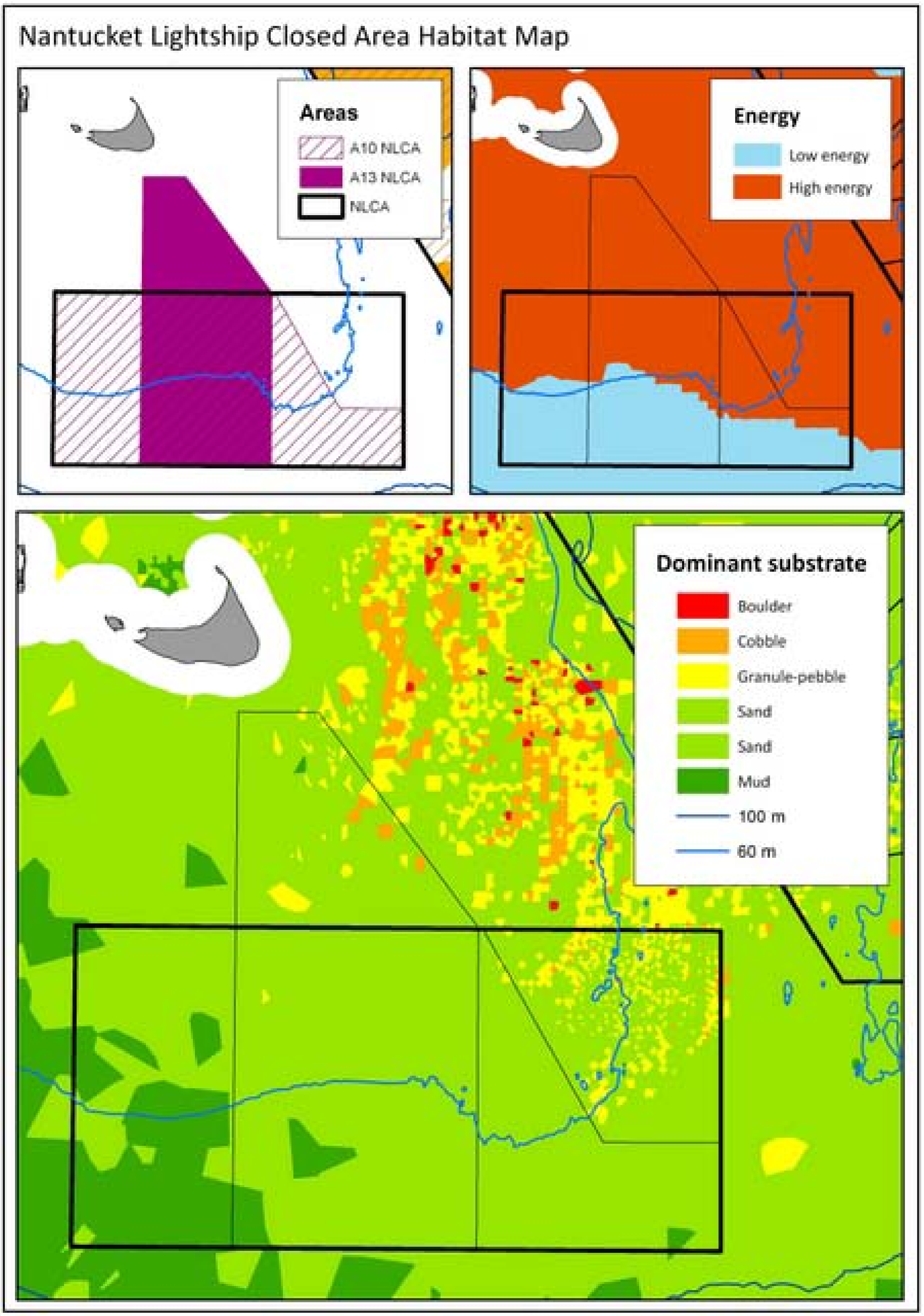


Figure 22 – Substrate composition and environmental energy in Closed Area II

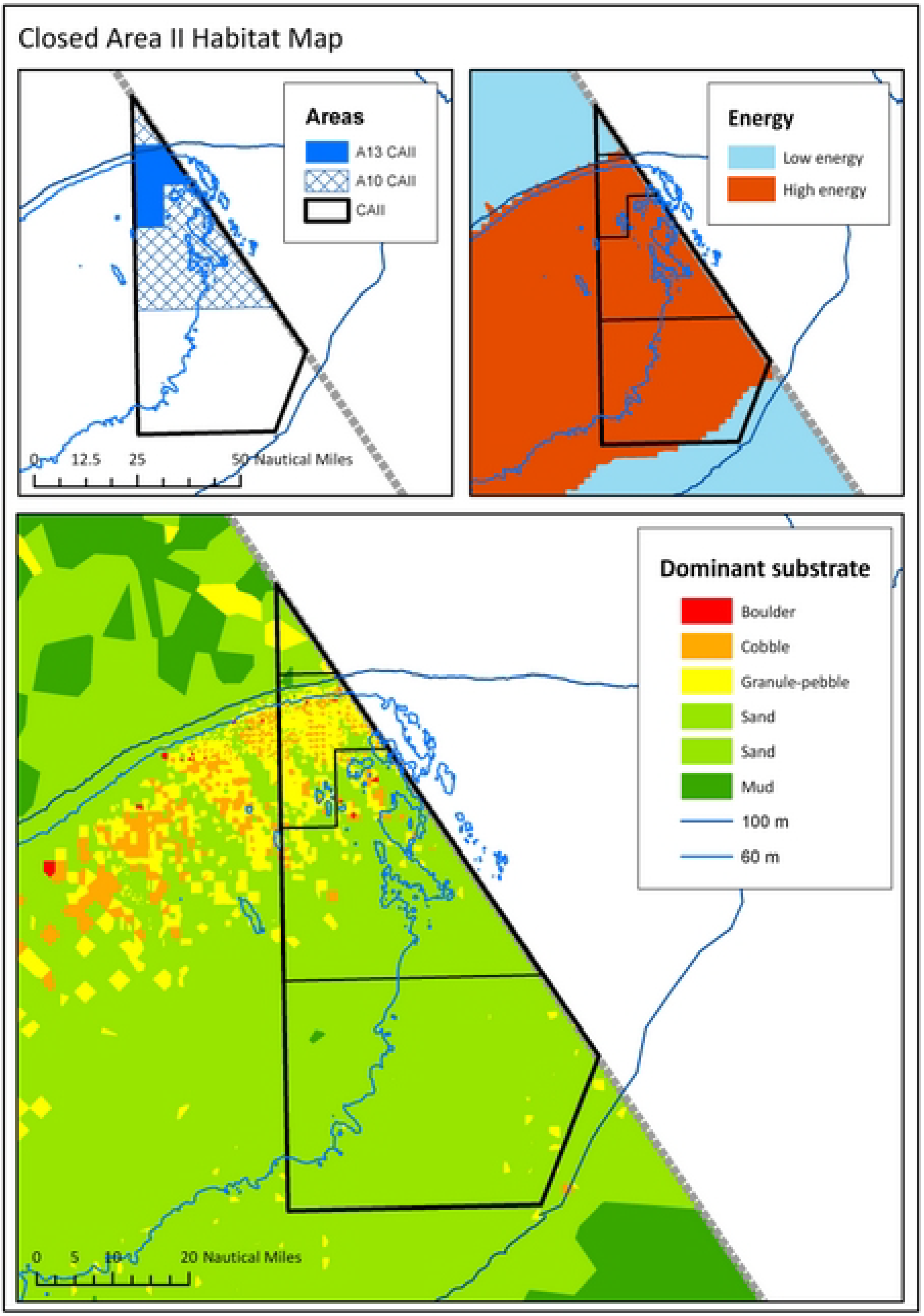
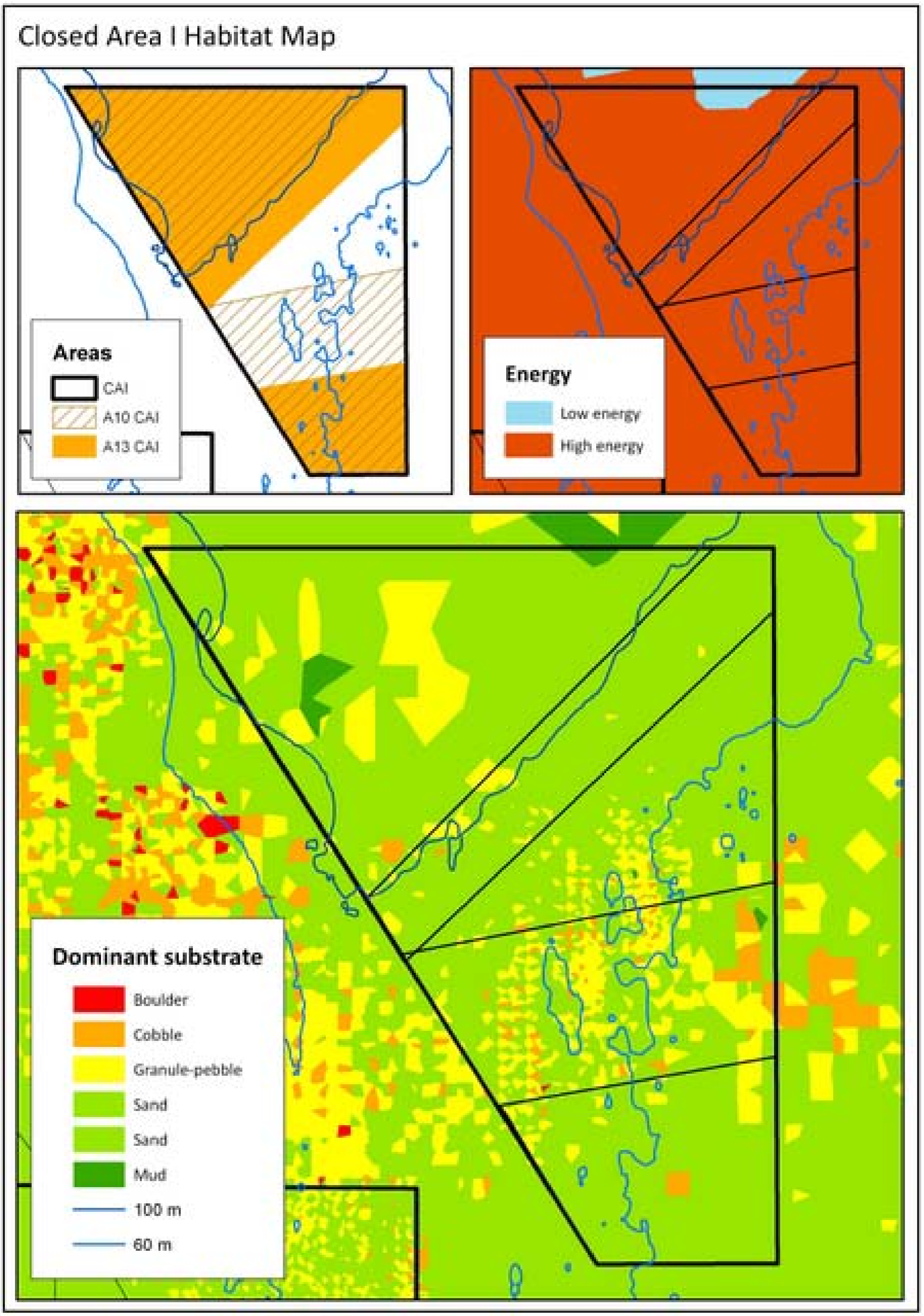


Figure 23 – Substrate composition and environmental energy in Closed Area I



4.3 PROTECTED RESOURCES

The following protected species are found in the environment in which the sea scallop fishery is prosecuted. A number of them are listed under the Endangered Species Act of 1973 (ESA) as endangered or threatened, while others are identified as protected under the Marine Mammal Protection Act of 1972 (MMPA). Two right whale critical habitat designations also are located within the action area. An update and summary is provided here to facilitate consideration of the species most likely to interact with the scallop fishery relative to the proposed action.

A more complete description of protected resources inhabiting the action area is provided in Amendment 10 to the Sea Scallop FMP (See Amendment 10 to the Atlantic Sea Scallop Fishery Management Plan, Section 7.2.7, Protected Species, for a complete list. An electronic version of the document is available at http://www.nefmc.org/scallops/index.html.).

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
Beaked whale (*Ziphius* and *Mesoplodon spp.*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
Spotted and striped dolphin (*Stenella spp.*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Bottlenose dolphin: coastal stocks (*Tursiops truncatus*)	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandica*)	Protected
Hooded seal (*Crystophora cristata*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered[2]
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered

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

4.3.1 Threatened and Endangered Species Not Likely to be affected by the Alternatives under Consideration

According to the most recent Biological Opinion (Opinion) provided by NMFS dated 3/14/08 (and amended February 5, 2009), the agency has previously determined that species not likely to be affected by the Scallop Fishery Management Plan or by the operation of the fishery include the shortnose sturgeon, the Gulf of Maine distinct population segment of Atlantic salmon, hawksbill sea turtles, and the following whales: North Atlantic right, humpback, fin, sei, blue, and sperm whales, all of which are listed as endangered species under the ESA. NMFS also concluded that the continued authorization of the sea scallop fishery would not have any adverse impacts on cetacean prey, and that it would not affect the oceanographic conditions that are conducive for calving and nursing of large cetaceans.

Large Cetaceans (Baleen Whales and Sperm Whale)
The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf and Maine and Georges Bank, and low latitude winter calving grounds (Perry et al. 1999; Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry et al. 1999; Waring et al. 2006). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993; Wiley et al. 1995; Perry et al. 1999; Brown et al. 2002).

In comparison to the baleen whales, sperm whale distribution occurs more on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2006). However, sperm whale distribution in U.S. EEZ waters also occurs in a distinct seasonal cycle (Waring et al. 2006). Typically, sperm whale distribution is concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the Mid-Atlantic Bight (Waring et al. 2006). Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 1999).

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

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

Based on the stock assessment data available, the minimum population estimates for other western north Atlantic whale stocks are 2,269 fin whales, 207 sei whales, 4,804 sperm whales, and 3,312 minke whales (Waring et al. 2009).   No recent estimates are available for blue whale abundance. Insufficient data exist to determine trends for any other large whale species.

For the North Atlantic population of humpback whales, the most recent stock assessment resulted in a population estimate of 11,570, although this number is considered to be negatively biased (Waring, et. al, 2009). Information from the stock assessment indicates an upward trend in abundance for the Gulf of Maine population, but is inconclusive about the North Atlantic population as a whole. Based on data available for selected areas and time periods, the minimum population estimates for other western north Atlantic whale stocks are 2,269 fin whales, 207 sei whales, 4,804 sperm whales, and 3,312 minke whales (Waring et al. 2009).   No recent estimates are available for blue whale abundance. Insufficient data exist to determine trends for any other large whale species.

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

Small Cetaceans (Dolphins, Harbor Porpoise and Pilot Whale)
Numerous small cetacean species (dolphins, pilot whales, harbor porpoise) occur within the area from Cape Hatteras through the Gulf of Maine. Seasonal abundance and distribution of each species in Mid-Atlantic, Georges Bank, and/or Gulf of Maine waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso's dolphin), and still others occupy all three habitats (e.g., common dolphin, spotted dolphins, striped dolphins). Information on the western North Atlantic stocks of each species is summarized in Waring *et al*. (2008).

Pinnipeds
Of the four species of seals expected to occur in the area, harbor seals have the most extensive distribution with sightings occurring as far south as 30° N (Katona *et al*. 1993). Grey seals are the second most common seal species in U.S. EEZ waters, occurring primarily in New England (Katona *et al.* 1993; Waring *et al*. 2006). Pupping colonies for both species are also present in New England, although the majority of pupping occurs in Canada. Harp and hooded seals are less commonly observed in U.S. EEZ waters. Both species form aggregations for pupping and breeding off of eastern Canada in the late winter/early spring, and then travel to more northern latitudes for molting and summer feeding (Waring *et al*. 2006). However, individuals of both species are also known to travel south into U.S. EEZ waters and sightings as well as strandings of each species have been recorded for both New England and Mid-Atlantic waters (Waring *et al*. 2006).

4.3.2 Threatened and Endangered Species Potentially Affected Adversely by the Alternatives under Consideration

In the 2008 BiOp, NMFS determined that the action being considered in the Opinion may adversely affect the following ESA-listed sea turtle species: loggerhead, leatherback, Kemp's ridley, and green sea turtles. Loggerheads are the most commonly observed taken species of sea turtle in the scallop fishery, thus most information herein pertains to loggerheads.

4.3.2.1 Sea Turtle Background

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

In general, sea turtles are long-lived species and reach sexual maturity relatively late (NMFS SEFSC 2001; NMFS and USFWS 2007a; 2007b; 2007c; 2007d, 2008). Sea turtles are injured and killed by numerous human activities (NRC 1990; NMFS and USFWS 2007a; 2007b; 2007c; 2007d; NMFS and USFWS 2008, NMFS NERO 2008). For example, in the 2008 loggerhead recovery plan (NMFS and USFWS 2008), the highest priority threats to the species were noted as bottom trawl, pelagic and demersal longline, and demersal large mesh gillnet fisheries; legal and illegal harvest; vessel strikes; beach armoring and erosion; marine debris ingestion; oil and light pollution; and predation by native and exotic species.

Loggerhead turtles

Loggerheads are found in temperate and subtropical waters and are the most common species of sea turtles in U.S. waters. The majority of nesting in US waters occurs on beaches of the southeastern U.S. (especially Florida). Waters as far north as 41-42^{o} N (Figure 1) are used for foraging, with common occurrences of the species from Florida through Cape Cod, MA.

A final revised recovery plan for loggerhead sea turtles in the Northwest Atlantic was recently published by NMFS and FWS in December 2008. The revised recovery plan is significant in that it identifies five unique recovery units, which comprise the population of loggerheads in the Northwest Atlantic, and describes specific recovery criteria for each recovery unit. The five recovery units (RU) representing nesting assemblages are: (1) the Northern Recovery Unit (Florida/Georgia border through southern Virginia), (2) the Peninsular Florida Recovery Unit (Florida/Georgia border through Pinellas County, Florida), (3) the Dry Tortugas Recovery Unit (islands located west of Key West, Florida), (4) the Northern Gulf of Mexico Recovery Unit (Franklin County, Florida through Texas), and (5) the Greater Caribbean Recovery Unit (Mexico through French Guiana, Bahamas, Lesser Antilles, and Greater Antilles).

The Recovery Team evaluated the status and trends of the Northwest Atlantic loggerhead population for each of the five recovery units, using nesting data available as of October 2008 (NMFS and USFWS 2008). Nest count data are a valuable source of information for each turtle species since the number of nests laid reflects the reproductive output of the nesting group each year. Based on the most recent information, a decline in annual nest counts has been measured or suggested for three of the five recovery units for loggerheads in the Northwest Atlantic. This includes Peninsular Florida RU, which is the largest (in terms of number of nests laid) in the

Atlantic Ocean. The nesting trends for the other two recovery units could not be determined due to an absence of long term data. Further, recent analysis of available data for the Peninsular Florida RU has led to the conclusion that the observed decline in nesting for that unit over the last several years can best be explained by an actual decline in the number of adult female loggerheads in the population (Witherington et al. 2009).

While some long term in-water population studies have shown an increase in loggerhead abundance (Pamlico Sound, NC; St. Lucie Nuclear Power Plant, FL), other areas have shown no trend (Indian River Lagoon, FL; Florida Bay, FL) or declining abundance (New York inshore waters; Virginia Chesapeake Bay) (NMFS and USFWS 2008, TEWG 2009).

NMFS convened a new Loggerhead Turtle Expert Working Group (TEWG) to review all available information on Atlantic loggerheads in order to evaluate the status of this species in the Atlantic (TEWG 2009). In this report, the TEWG indicated that it could not determine whether or not the decreasing annual numbers of nests among the Northwest Atlantic loggerhead subpopulations were due to stochastic processes resulting in fewer nests, a decreasing average reproductive output of adult females, decreasing numbers of adult females, or a combination of these factors. Many factors are responsible for past or present loggerhead mortality that could impact current nest numbers; however, no single mortality factor stands out as a likely primary factor.

Currently, there are no population estimates for loggerhead sea turtles in any of the ocean basins in which they occur. However, NMFS SEFSC recently developed a stage/age demographic model to help determine the estimated impacts of mortality reductions on loggerhead sea turtle population dynamics (NMFS SEFSC 2009). One of the results of this model was an estimate of the minimum adult female population size for the western North Atlantic over the period 2004-2008. NMFS SEFSC (2009) estimated the minimum adult female population size to be likely between approximately 20,000 to 40,000 individuals, with a large range of uncertainty in total population size.

A status review for the loggerhead sea turtle was completed by the Biological Review Team (BRT) and submitted to NMFS and FWS in August 2009. In this status review, the BRT evaluated the best available data, determined whether population segments exist, and assessed the extinction risk for each potential Distinct Population Segments (DPS). Nine DPSs were identified, consisting of the North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Southeast Indo-Pacific Ocean, Southwest Indian Ocean, Northwest Atlantic Ocean, Northeast Atlantic Ocean, Mediterranean, and South Atlantic Ocean DPSs. Overall, the BRT concluded that the Northeast Atlantic and Mediterranean DPSs are at immediate risk of extinction; the North Pacific, South Pacific, North Indian, Southeast Indo-Pacific, and Northwest Atlantic DPSs are currently at risk of extinction; and the Southwest Indian and South Atlantic DPSs are likely not currently at immediate risk of extinction. Note that the Northwest Atlantic Ocean DPS is the relevant DPS for the Atlantic sea scallop fishery, with the DPS delineated by 60° N latitude and the equator as the north-south boundaries and 40° W longitude as the east boundary.

NMFS and FWS reviewed the BRT report and the best scientific and commercial data available regarding the past, present and future threats faced by the nine DPSs. On March 16, 2010, the agencies issued a proposed rule that determined the nine DPS qualify as "species" for listing under the ESA and proposed the listing of two DPS as threatened and seven as endangered (including the Northwest Atlantic Ocean DPS). Comments on this proposed rule are due on September 13, 2010. After that time, the agencies will review the comments and prepare a final determination, which may or may not be what was proposed. Typically a listing action becomes effective 30 days after publication of the final rule in the Federal Register. Only after that final listing decision is announced in the Federal Register would DPSs be applied, if deemed necessary and warranted, and a new listing be in effect. Critical habitat will be proposed for the two DPSs occurring within the U.S. (Northwest Atlantic Ocean and North Pacific Ocean DPSs), if found to be prudent and determinable, in a separate rulemaking.

A new listing decision for loggerhead sea turtles would likely warrant reinitiation of section 7 consultation on the Atlantic sea scallop fishery, but that would not happen until after a final determination was issued. The status review or proposed rule do not impact anything the Council and NMFS need to do for FW22.

Leatherback, Kemp's ridley and green turtles
Leatherback sea turtles have a high tolerance to relatively low water temperatures, which allows them to be widely distributed throughout the world's oceans. Leatherbacks seem to be most vulnerable to entanglement in fishing gear, including bottom otter trawls. Nest counts for leatherback sea turtles as well as Kemp's ridley and green sea turtles in the Atlantic demonstrate increased nesting by these species (NMFS and USFWS 2007b; 2007c; 2007d). The leatherback TEWG evaluated nesting data and considered the 5th and 95th percentiles across individual subpopulations to estimate a population of 34,000-94,000 adult leatherbacks in the North Atlantic (TEWG 2007).

Kemp's ridley sea turtles are one of the least abundant sea turtles. They typically occur in the Gulf of Mexico and northern half of the Atlantic Ocean. Foraging areas along the Atlantic Coast include Pamlico Sound, Chesapeake Bay, Long Island Sound, Charleston Harbor, and Delaware Bay. The adults are found primarily in near-shore waters of 37m or less with sandy or muddy bottom.

Green sea turtles have a circumglobal distribution, ranging from the mid-Atlantic to Argentina and occurring seasonally in mid-Atlantic and New England waters. Of the 23 nesting groups assessed in the NMFS and USFWS (2007) report, 10 were considered increasing, 9 were considered stable, and 4 were considered decreasing. Fishery mortality accounts for a large proportion of annual anthropogenic mortality outside of the nesting beaches.

4.3.2.2 Impacts on Sea Turtles – 2008 Biological Opinion

On February 23, 2007, the NEFSC released NEFSC Reference Document 07-04 (Murray 2007). Based on observer data for the scallop trawl fishery for 2004 and 2005, Murray (2007) provided the first estimates of the average annual bycatch of loggerhead sea turtles in scallop trawl gear. NMFS NERO determined that the reference document presented new information regarding the capture of sea turtles in scallop trawl gear that reveals effects of the action that may affect listed sea turtles in a manner or to an extent not previously considered. Therefore, in accordance with the regulations at 50 CFR 402.16, formal consultation was reinitiated on April 3, 2007, to reconsider the effects of the Atlantic sea scallop fishery on ESA-listed sea turtles. Consultation was completed on March 14, 2008.

The 2008 Biological Opinion identified four endangered or threatened sea turtle species that may be adversely affected by the Scallop FMP and the fishery: loggerhead, leatherback, Kemp's ridley and green sea turtles, but concluded that the fishery was not likely to jeopardize their continued existence. Summary information is provided here that broadly describes the general distribution of sea turtles within the scallop action area, as well as the known interactions with sea scallop gear.

Additional background information on the relevant sea turtle species can be found in a number of published documents. These include sea turtle status reviews and biological reports (NMFS and USFWS 1995; NMFS and USFWS 2009; Hirth 1997; USFWS 1997; Marine Turtle Expert Working Group (TEWG) 1998, 2000, & 2009; NMFS and USFWS 2007a, b, c, d; Murray 2007; Leatherback TEWG 2007; Haas et al. 2008; Murray 2008; Merrick and Haas 2008), and recovery plans for Endangered Species Act-listed sea turtles (NMFS 1991; NMFS and USFWS 1991a; NMFS and USFWS 1991b; NMFS and USFWS 1992; NMFS and USFWS 1998; USFWS and NMFS 1992; NMFS and NMFS 2005; NMFS and USFWS 2008).

Results from a study done by Merrick and Haas (2008) suggest that mortalities of loggerhead sea turtles in the Atlantic sea scallop dredge and trawl fisheries are detectable, but have a relatively small effect on the trajectory of the adult female components of the western North Atlantic loggerhead sea turtle population over the next 100 years. The 1989-2005 population trends, with and without mortalities, were not significantly different and the probability of reaching the quasi-extinction threshold (250 adult females) under both alternatives was 0.01. Median times to extinction for both were greater than 200 years. This lack of impact occurred regardless of the use of values that generated the greatest consequence of the sea scallop fisheries takes of loggerheads. Comparing the effect of different background mortalities on population trajectories suggests that the relatively steep declining trend in population from 1996-2005 is being driven by some other larger source of mortality (Merrick and Haas 2008).

Estimated Sea Turtle Takes

The 2008 BiOp anticipated that up to 929 loggerheads will be captured biennially in the scallop dredge fishery, of which 595 are anticipated to be lethal. The 2008 BiOp also estimated that annually in the scallop dredge fishery there will be takes of 1 leatherback, 1 Kemp's ridley, and 1 green sea turtle (all of which may be lethal or non-lethal). The 2008 BiOp estimate of annual takes for the scallop trawl fishery is 154 loggerheads (20 lethal), 1 leatherback, 1 Kemp's ridley, and 1 green sea turtle (all of which may be lethal or non-lethal).

Sea turtles are known to be captured in scallop dredge and trawl gear, gear types that are used in the fisheries affected by this action. As the Loggerhead Recovery Plan (NMFS and USFWS 2008) discussed, loggerheads can be struck and injured or killed by scallop dredge frames or captured in the bag where they may drown or be further injured or killed when catch and heavy gear are dumped on deck. The most commonly described interaction is that of an injured juvenile loggerhead turtle caught in a dredge and brought aboard a vessel (Haas et al. 2008). The average estimated number of hard-shelled turtle interactions in the Mid-Atlantic scallop dredge fishery from 2001- 25 September 2006 (prior to chain mats) was 288 turtles per year, and 125 turtles per year from Sept 26 2006 – 2008. Factors affecting estimated interaction rates of turtles from 2001-2008 were sea surface temperature, depth, and use of a chain mat (Murray, 2011).

Changes over the 3 years include implementation of rotational closed areas, and voluntary use of chain mats that prevent turtles (live and/or killed or injured by the dredge) from entering the bag and being observed (also referred to as "turtle chains"). The majority of loggerheads captured in the scallop dredge and trawl fisheries were likely derived from the south Florida nesting populations with relatively small representation from each of the other potential source populations (Haas et al. 2008).

The 2008 BiOp summarizes information available at that time concerning sea turtle interactions with scallop gear, though additional information has been published since (Murray, 2011). The BiOp states that there were 91 observed sea turtle takes in scallop dredge gear from1996 to 2008. Of these, 9 were decomposed so could have died prior to capture. Of the remaining 82, 57 were identified as loggerheads, one as green, two as Kemp's ridley, and 22 were unidentified. Six were fresh dead, 34 were injured, 22 were uninjured, and 18 were alive but their condition was unknown. One primary issue is that being caught in the gear likely results in a higher level of mortality than evidenced due to submergence and contact injuries. Submergence injuries are classified as an absence or reduction in breathing and consciousness with no other apparent injuries; mortality is strongly dependent on tow time. Tows of less than 10 minutes likely achieve <1% mortality rate, which is considered negligible, and a rapid escalation in mortality rate does not occur until after 50 minutes of tow time (Sasso and Epperly 2006). This data is for trawl gear, but NMFS assumes the same is true for dredge gear. Because scallop dredge tows are generally less than or equal to 1 hour, this should help reduce the risk of death from forced submergence. Contact injuries are classified as including scrapes or cuts to soft tissues, cracks to the carapace and/or plastron, missing or damaged scutes, and/or bleeding from one or more orifice.

Chain mats do not decrease the number of turtles that come in contact with the gear; rather they decrease the likelihood that turtles will suffer serious injuries from being caught in the dredge bag. However, since NMFS cannot quantify the decrease in the mortality rate, they adhered to the 64% mortality rate that was in effect prior to chain mat implementation. This mortality rate was based on NMFS working guidance for serious injury determinations for sea turtles caught in scallop dredge gear and the analysis of observed scallop dredge takes in 2003. A 64% mortality rate assigned to the estimated 929 biennial loggerhead takes estimates that 595 of those takes will be lethal. The BiOp further stated that any Kemp's ridley and green sea turtle will be killed by the dredge fishery upon interaction; however, leatherback turtle takes are unlikely to be lethal because the interactions are more likely to happen in the water column, and because they are not likely to get caught in a dredge with a chain mat due to their size (both of which are not true for Kemp's and greens).

From 2004-2007, there were 16 observed takes in scallop trawl gear reported in the 2008 BiOp. All were captured in the net. One was dead before the tow and was decomposing. Of the non-decomposed turtles, 14 were loggerheads and one was unidentified. Twelve of the 14 turtles examined on board were alive with no apparent injuries. These takes were observed from June through September. An estimated 154 loggerheads were captured in trawl gear from 2004-2005, which is the best available information about the annual takes of loggerheads from the scallop trawl fishery. There were no observed leatherback, Kemp's ridley, or green sea turtle takes in scallop trawl gear. NMFS has not yet developed any serious injury criteria for turtles caught in scallop trawl gear.

According to the 2008 BiOp, the level of bycatch mortality removed from the turtle population would need to be much greater than the bycatch observed in the scallop fishery in order to have major effects on the population trajectory.

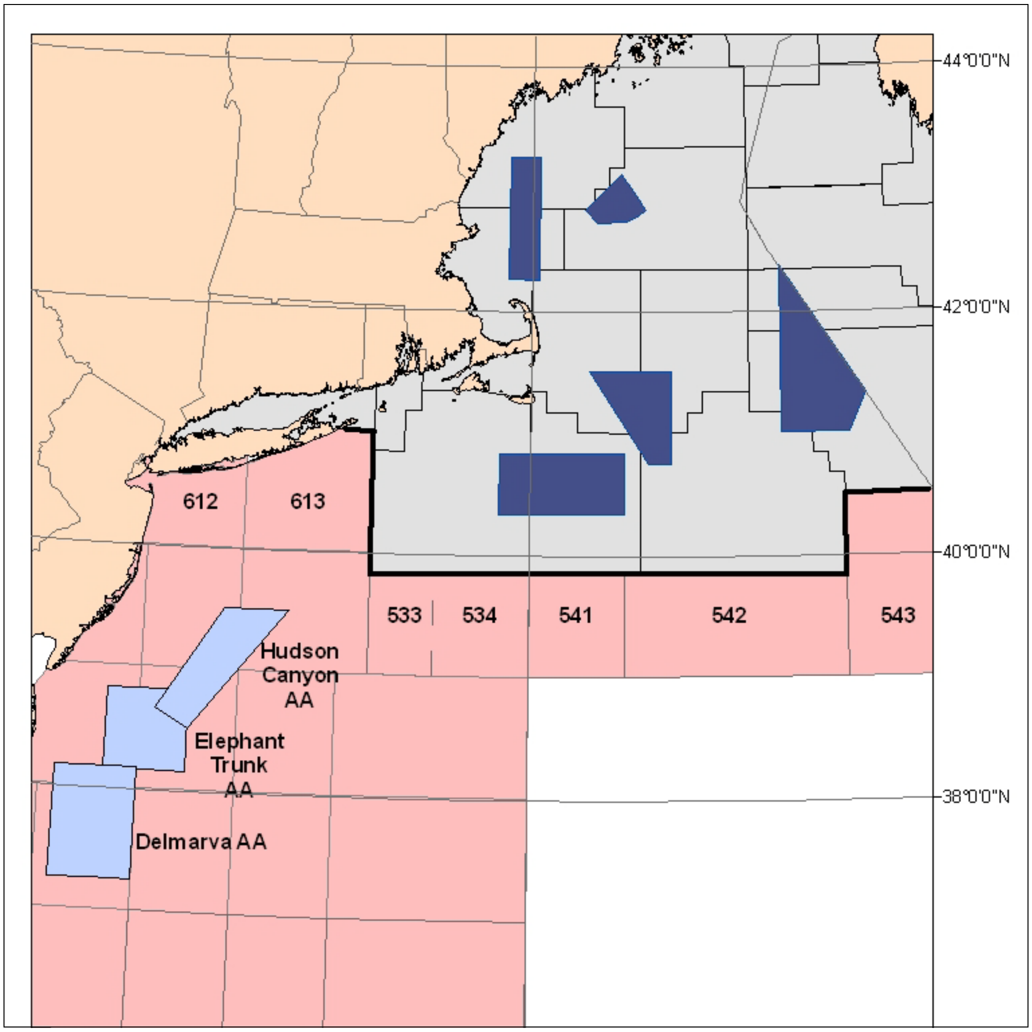
Action Required by 2008 Biological Opinion

The overall conclusion of the 2008 BiOp for the sea scallop fishery is: "*After reviewing the current status of loggerhead, leatherback, Kemp's ridley, and green sea turtles, the environmental baseline and cumulative effects in the action area, the effects of the continued authorization of the Scallop FMP (including the seasonal use of chain mat modified scallop dredge gear in Mid-Atlantic waters), it is NMFS' biological opinion that the proposed activity may adversely affect but is not likely to jeopardize the continued existence of loggerhead, leatherback, Kemp's ridley and green sea turtles.*"

Specifically, the 2008 BiOp concluded that the four ESA-listed turtles will continue to be affected by the continued authorization of the scallop fishery as a result of: (a) capture in scallop dredge and trawl gear, and (b) physical contact with chain-mat equipped scallop dredge gear that may or may not result in subsequent capture of the sea turtle in the dredge bag or retention of the turtle against the outside of the dredge bag that is visible upon hauling of the gear. However, one major impact on turtles generally is ship strikes, which the BiOp found the scallop fishing vessels unlikely to do based on (a) scallop fishing vessels operate at a relatively low speed, (b) a portion of the fishing occurs in areas in which sea turtles are less or not likely (Georges Bank and Gulf of Maine), (c) a portion of the fishing occurs at times when sea turtles are not likely to be present (winter in the Mid-Atlantic and late fall thru mid spring in New England), (d) sea turtles spend part of their time at depths out of range of a vessel collision, (e) the proposed action is not expected to increase the amount of vessel traffic in areas where sea turtles occur, and (f) the fishery will continue as a limited access fishery such that the number of participants are expected to be further constrained. Lastly, continued authorization of the scallop fishery will not likely reduce the availability of prey for the four species of sea turtles.

The 2008 BiOp had five non-discretionary reasonable and prudent measures (RPMs) with an associated five terms and conditions (T&C) that implement the RPMs. The first RPM is the only one that directly affects the allocated effort in the fishery. The other RPMs (2-5) are more related to research needs and investigation of turtle interactions with the scallop fishery. RPM #1 states that *NMFS must limit the amount of allocated scallop fishing effort by "Limited access scallop vessels" as such vessels are defined in the regulations (50 CFR 648.2), that can be used in the area and during the time of year when sea turtle distribution overlaps with scallop fishing activity* (as amended 2/5/09). Its associated T&C is: *to comply with (RPM 1), no later than the 2010 scallop fishing year, NMFS must limit the amount of allocated limited access scallop fishing effort that can be used in waters south of the northern boundaries of statistical areas 612, 613, 533, 534, 541-543* (Figure 1) *during the periods in which turtle takes have occurred. Restrictions on fishing effort described above shall be limited to a level that will not result in more than a minor impact on the fishery* (as amended 2/5/09).

Figure 24 – Area defined in the biological opinion relating to sea turtles. Includes waters south of the northern boundaries of statistical areas 612, 613, 533, 534, 541, 542, and 543. In this document this area is sometimes described as the "Mid-Atlantic."



The following are RPMs 2-5:

2. *NMFS must continue to investigate and implement, as appropriate, gear modifications for scallop dredge and trawl gear to reduce the capture of sea turtles and/or the severity of the interactions that occur.*
3. *NMFS must review available data to determine whether there are areas (i.e., "hot spots") within the action area where sea turtle interactions with scallop dredge and/or trawl gear are more likely to occur.*
4. *NMFS must quantify the extent to which chain mats reduce the number of serious injuries/deaths of sea turtles that interact with scallop dredge gear.*
5. *NMFS must determine (a) the extent to which sea turtle interactions with scallop dredge gear occur on the bottom vs. within the water column and (b) the effect on sea turtles of being struck by the scallop dredge.*

The T&C 2-5 are as follows:

2. *To comply with 2 above, NMFS must continue to investigate modifications of scallop trawl and dredge gear. Within a reasonable amount of time following completion of an experimental gear trial from or by any source, NMFS must review all data collected from the experimental gear trials, determine the next appropriate course of action (e.g., expanded gear testing, further gear modification, rulemaking to require the gear modification), and initiate action based on the determination. The goal of this RPM is ultimately to require modification of fishing gear used in the scallop fishery operating under the Atlantic Sea Scallop FMP within a reasonable timeframe following sound research that demonstrates that the gear modification is reasonable and feasible and will help to minimize the number and/or severity of sea turtle interactions with scallop fishing gear.*
3. *To comply with 3 above, NMFS must review all data available on the observed take of sea turtles in the scallop fishery and other suitable information (i.e., data on observed turtle interactions for other fisheries or fishery surveys in the area where the scallop fishery operates) to assess whether there is sufficient information to identify "hot spots" within the action area. Within a reasonable amount of time after completing the review, if NMFS determines that "hot spots" do exist, NMFS must take appropriate action to reduce sea turtle interactions and/or impacts within any identified hot spot.*
4. *To comply with 4 above, NMFS must use available and appropriate technologies (e.g., underwater video as part of an experiment using scallop dredge gear in either the natural or controlled environment, computer modeling, etc.) to quantify the extent to which chain mats reduce the number of serious injuries/deaths of sea turtles that interact with scallop dredge gear. This information is necessary to better determine the extent to which chain mats do reduce injuries leading to death for sea turtles and may result in further modifications of the fishery to ensure sea turtle interactions and/or interactions causing death are minimized. Initiate study no later than fiscal year 2009.*
5. *To comply with 5 above, NMFS must use available and appropriate technologies to better determine where (on bottom or in the water column) and how sea turtle interactions with scallop dredge gear are occurring. Such information is necessary to assess whether further gear modifications in the scallop dredge fishery will actually provide a benefit to sea turtles by either reducing the number of interactions or the number of interactions causing mortal injuries. Initiate study no later than fiscal year 2009.*

The 2008 BiOp also includes other requirements for monitoring, as well as several conservation recommendations. Conservation recommendations are discretionary activities designed to minimize or avoid adverse effects of an action, to help implement recovery plans, or to develop information. They are recommendations, not requirements like RPMs.

4.3.2.3 Overall Sea Turtle Conservation

Below is a summary of some of the measures in place for turtle conservation under the Scallop FMP and outside of the Scallop FMP. In addition, this section summarizes the recent and current research being conducted on sea turtles and the scallop fishery that address many of the research objectives of the Reasonable and Prudent Measures identified in Biological Opinions for the scallop fishery.

<u>Measures in place outside the Scallop FMP that still affect the scallop fishery</u>

On February 15, 2007, NMFS issued an advance notice of proposed rulemaking to announce it is considering amendments to the regulatory requirements for turtle excluder devices (TEDs). Among other issues, NMFS is considering requiring the use of TEDs in the Mid-Atlantic sea scallop trawl fishery, and moving the current northern boundary of the summer flounder fishery sea turtle protection area off of Cape Charles, VA to a point farther north. The objective of the proposed measures is to effectively protect all life stages and species of sea turtles where they are vulnerable to incidental capture and mortality in Atlantic trawl fisheries.

Among the many recovery objectives identified in the Loggerhead Recovery Plan (NMFS and USFWS 2008), one is to minimize bycatch in domestic and international commercial and artisanal fisheries. The plan includes 34 Priority 1 Actions needed that include promulgating regulations to require TEDs in trawl fisheries where they are currently not required, implementing seasonal TED regulations for domestic commercial non-shrimp trawl fisheries operating from Cape Charles, VA, north to Long Island Sound, and enforcement of fishery regulations to minimize loggerhead bycatch in commercial trawl fisheries.

Measures in place under the Scallop FMP

There are a number of measures currently in place that help minimize interactions with turtles and the effect of those interactions on turtles now and in the future. These include a NMFS rule that mandates use of a chain mat from May 1 through November 30 in all areas south of 41° 9.0' N, and the research set-aside program included in the FMP that has funded a number of turtle-related projects. In addition, rotational area management has increased catch per unit effort thus the time that gear is in the water and could impact turtles has been reduced dramatically. See Section 0 for more detailed analyses of how effort levels have changed in the scallop fishery, particularly in the Mid-Atlantic during the time of year when turtles are more likely to be present.

NMFS finalized a rule (71 FR 50361, August 23, 2006) that requires modification of Atlantic sea scallop dredge gear, regardless of dredge size, by a chain mat when the gear is fished in waters south of 41 9.0' N from the shoreline to the outer boundary of the EEZ during the period May 1 through November 30 each year. These regulations were modified through subsequent rulemakings (71 FR 66466, November 15, 2006; 73 FR 18984, April 8, 2008; 74 FR 46930, September 14, 2009). However, these modifications did not change the temporal or spatial extent of the chain mat requirements. The intent of the dredge gear modification is to reduce the severity of some turtle interactions that might occur by preventing turtles from entering the dredge bag.

While turtle observations have been reduced since the chain mat regulations went into place, there have still been several takes in the sea scallop dredge fishery in recent years. In 2007, there were 5 takes in scallop dredge gear. Four of the takes, all loggerhead sea turtles, occurred south of the northern boundary of the chain mat regulation, while one take, a Kemp's ridley sea turtle, was documented north of this line. Of the four takes south of the line, one of the turtles was observed on top of the dredge frame, swimming away before the dredge came on deck; two were observed in the dredge bag; and one turtle was reported between the chain mat and the dredge. There were two takes in scallop dredge gear in 2008 in the dredge frame. There were three takes in scallop dredge gear in 2009 (data available through September 2009).

The research set-aside program, with additional NMFS financial support through contracts, has and continues to address many of the research objectives of the Reasonable and Prudent Measures (RPMs) identified in a series of Biological Opinions (BiOps) issued by NMFS for the sea scallop fishery. The sea scallop industry and its research partners have been working with NMFS to address specific RPMs since 2003. A summary of RPMs and how research has and continues to address sea turtle bycatch is below. Two outputs from some of this research that are currently being used by a growing number of scallop industry participants but are not required are a “turtle excluder dredge” and a “placard” that describes how to handle turtles safely and how to reduce the potential for interactions by rigging chain mats on the dredge.

<u>Specific research that has been conducted related to RPMs in 2008 biological opinion</u>
Research has been grouped by topic based on the RPMs in the 2008 biological opinion. The first RPM, related to limiting effort, is addressed in Section 2.9.1; RPMs #2 - #5, and the term and conditions (T&Cs) used to implement the RPMs, are all related to research and are summarized below. There is no time limit for when the agency must comply with these RPMs, and it is likely that future research funded through the RSA program will continue to support these projects since turtle related research is listed as a research priority for RSA funds. This is not a complete list of the work that has been or is being conducted to help comply with these RPM, this is only a list of the projects the PDT is aware of, many of which were fully funded by, partially funded by the Scallop RSA program, or through contracts with NMFS.

RPM #2 – Term and Condition #2
<u>RPM #2</u>: NMFS must continue to investigate and implement, as appropriate, gear modifications for scallop dredge and trawl gear to reduce the capture of sea turtles and/or the severity of the interactions that occur.
<u>T&C#2</u>: To comply with 2 above, NMFS must continue to investigate modifications of scallop trawl and dredge gear. Within a reasonable amount of time following completion of an experimental gear trial from or by any source, NMFS must review all data collected from the experimental gear trials, determine the next appropriate course of action (e.g., expanded gear testing, further gear modification, rulemaking to require the gear modification), and initiate action based on the determination. The goal of this RPM is ultimately to require modification of fishing gear used in the scallop fishery operating under the Atlantic Sea Scallop FMP within a reasonable timeframe following sound research that demonstrates that the gear modification is reasonable and feasible and will help to minimize the number and/or severity of sea turtle interactions with scallop fishing gear.

Turtle Excluder Devices (TEDs) have been proven to be an effective method to minimize adverse effects related to sea turtle bycatch in the shrimp trawl fishery, summer flounder trawl fishery, several state trawl fisheries, and certain other trawl fisheries around the world. TEDs have an escape opening, usually covered by a webbing flap that allows sea turtles to escape from trawl nets. Research has been conducted on catch retention of Atlantic sea scallops in trawl nets equipped with a TED.

As described above, the chain mat is designed to prevent sea turtles from being captured in the dredge bag. The chains were found to be 100% effective in keeping turtles out of the dredge bag during the research trials, but it should be noted that the potential exists for the smallest turtles to pass through the spacing in the chain and result in a take (NMFS 2008). Another modification being tested is a modified dredge frame designed to guide sea turtles over the dredge. (See DuPaul et al. (2004) and Smolowitz et al. (2010) for more information).

The two components of the design work independently; the chains prevent sea turtles from entering the dredge bag and the frame modifications prevent entrapment on top or underneath the dredge. While research continues to determine the magnitude of turtle encounters that take place while the dredge is on the sea floor or up in the water column, the new dredge design is proving to be successful in retaining scallop catch and has been shown to guide experimental sea turtle carcasses up and over the frame. This research is documented in the following reports: Smolowitz et al. 2010; Smolowitz and Weeks, 2008; Smolowitz and Weeks, 2008b, Milliken et al., 2007, and Smolowitz et al., 2005.

RPM #3 – Term and Condition #3
RPM#3: NMFS must review available data to determine whether there are areas (i.e., "hot spots") within the action area where sea turtle interactions with scallop dredge and/or trawl gear are more likely to occur.
T&C #3: To comply with 3 above, NMFS must review all data available on the observed take of sea turtles in the scallop fishery and other suitable information (i.e., data on observed turtle interactions for other fisheries or fishery surveys in the area where the scallop fishery operates) to assess whether there is sufficient information to identify "hot spots" within the action area. Within a reasonable amount of time after completing the review, if NMFS determines that "hot spots" do exist, NMFS must take appropriate action to reduce sea turtle interactions and/or impacts within any identified hot spot.

Ongoing and proposed research using an ROV and oceanographic sampling in conjunction with sea turtle tracking is shedding light on the location of the turtles geographically and on the amount of time they spend at the surface and on the sea floor. These projects have advanced the ability to locate, track and observe loggerhead sea turtles through innovative use of dredge- and ROV-mounted video cameras and side-scan sonar. Recent field work carried out in 2009 and 2010 tracked and observed sea turtles throughout the water column with an ROV.

During the same time period, oceanographic data was collected at a series of stations and during aerial over-flights in order to establish the localized oceanographic features associated with turtle distributions. Proposed work will continue to build this unique set of observational records and use them to assess ideas regarding the factors that govern sea turtle distributions and behavior in the Mid-Atlantic Bight (MAB) shelf region. While past studies have focused mainly on sea surface temperature and bathymetry as controlling and/or predictive factors (e.g. Hawkes et al., 2007; Murray, 2007), ongoing research postulates that on time scales of days to weeks, sea turtle "hot spots" are more closely tied to the geography of oceanographic fronts associated with water mass and chlorophyll gradients driven by wind stress and buoyancy (density) contrasts. These linkages will be investigated by conducting regional hydrographic surveys with shipboard CTD (conductivity/ temperature/ depth), fluorometer and ADCP (Acoustic Doppler Current Profiler) measurements in conjunction with aerial sea turtle sighting and ROV video tracking surveys.

In addition, a recent manuscript evaluated turtle interactions in scallop dredge gear using a longer time series of data (2001 to 2008) to assess factors correlated with high and low bycatch rates in the scallop fishery (Murray 2011).

RPM #4 – Term and Condition #4
<u>RPM#4</u>*: NMFS must quantify the extent to which chain mats reduce the number of serious injuries/deaths of sea turtles that interact with scallop dredge gear.*
<u>T&C #4</u>*: To comply with 4 above, NMFS must use available and appropriate technologies (e.g., underwater video as part of an experiment using scallop dredge gear in either the natural or controlled environment, computer modeling, etc.) to quantify the extent to which chain mats reduce the number of serious injuries/deaths of sea turtles that interact with scallop dredge gear. This information is necessary to better determine the extent to which chain mats do reduce injuries leading to death for sea turtles and may result in further modifications of the fishery to ensure sea turtle interactions and/or interactions causing death are minimized. Initiate study no later than fiscal year 2009.*

It is important to be able to quantify the effectiveness of chain mats in reducing potential injury to turtles during towing of the standard New Bedford dredge. NMFS continues to explore options on how to best evaluate the effectiveness of chain mats.

RPM #5 – Term and Condition #5
<u>RPM#5</u>*: NMFS must determine (a) the extent to which sea turtle interactions with scallop dredge gear occur on the bottom vs. within the water column and (b) the effect on sea turtles of being struck by the scallop dredge.*
<u>T&C #5</u>: *To comply with 5 above, NMFS must use available and appropriate technologies to better determine where (on bottom or in the water column) and how sea turtle interactions with scallop dredge gear are occurring. Such information is necessary to assess whether further gear modifications in the scallop dredge fishery will actually provide a benefit to sea turtles by either reducing the number of interactions or the number of interactions causing mortal injuries. Initiate study no later than fiscal year 2009.*

As mentioned above, ongoing and proposed use of ROVs and oceanographic sampling along with tracking of tagged sea turtles will likely provide more information on seasonal locations and behavior of these animals which will aid in bycatch avoidance and scallop management. Knowledge of where turtles spend their time in the water column is one of the major outcomes of this research, which will help to assess current gear regulations and proposed modifications.

In 2009 and 2010, Coonamessett Farm and NMFS staff successfully attached Fastloc Argos satellite tags to 16 juvenile loggerhead turtles in the HCAA. The tags are transmitting turtle location, time at depth, and water temperature data. This data will be incorporated with all the other data collection efforts to evaluate juvenile loggerhead behaviors on the scallop grounds. The tagging and ROV work will provide information toward addressing RPM 5a.

It is important to determine and minimize the potential injury from a standard dredge interacting with a turtle. If one assumes that the turtle excluder dredge is highly effective in preventing turtles from getting under the cutting bar, a comparison of the two dredge types, without chain mats, would shed light on this issue. If both dredges have an equal probability of catching turtles in the water column, then a comparison should show no difference in takes between dredge types if there are no bottom interactions. This might indicate turtles are not suffering significant serious injury/deaths in interactions with conventional scallop gear as a result of interactions on the bottom. If the take numbers between dredge types are the same, it could also indicate that the turtle excluder dredge is not reducing bottom interactions as anticipated. If the standard dredge catches significantly more turtles, then there is a high probability that it is catching those turtles on the sea floor and the potential for injury exists. Another issue regarding the modified frame is whether the initial encounter with the dredge causes injury, the severity of that injury, and the effectiveness of the modified dredge at reducing those injuries.

Proposed dredge comparison work will be a continuation of a study started by the NEFSC's Protected Species Branch and all protocols set forth by the NEFSC during previous contract work with Coonamessett Farm. To date, a total of more than 1500 paired tows have been observed following these protocols. In order to obtain statistically significant results, an additional 600 to 3000 paired tows may have to be observed due to the rarity of observed turtle-dredge interactions. This portion of the proposed study will take place on commercial fishing vessels working under normal fishing operations, but without the required turtle chain mats, during the months and areas in which loggerhead turtle interactions are known to occur. A total of at least 600 paired tows was planned to be observed on vessels fishing a standard New Bedford scallop dredge and a Coonamessett Farm turtle excluder dredge simultaneously during 2010. A NMFS-certified scallop fisheries observer will be onboard to record all catch and tow data while also observing sea turtle interactions.

4.4 ECONOMIC AND SOCIAL TRENDS IN THE SEA SCALLOP FISHERY

4.4.1 Introduction

This section of the document describes the economic and social trends of the scallop fishery. Specifically trends in landings, revenues, prices, producer surplus and profits for the sea scallop fishery since 1994, and as such, it provides a background for the economic analyses that are conducted for Amendment 15 alternatives. In addition, this section describes background information about the scallop fishery in various ports and coastal communities in the Northeast.

4.4.2 Trends in Landings, prices and revenues

In the fishing years 2002-2009, the landings from the northeast sea scallop fishery stayed above 50 million pounds, surpassing the levels observed historically (Figure 25). The recovery of the scallop resource and consequent increase in landings and revenues was striking given that average scallop landings per year were below 16 million pounds during the 1994-1998 fishing years, less than one-third of the present level of landings. The increase in the abundance of scallops coupled with higher scallop prices increased the profitability of fishing for scallops by the general category vessels. As a result, general category landings increased from less than 0.4 million pounds during the 1994-1998 fishing years to more than 4 million pounds during the last five fishing years (2005-2009), peaking at 7 million pounds in 2005 or 13.5% of the total scallop landings.

Figure 25. Scallop landings by permit category and fishing year (dealer data)

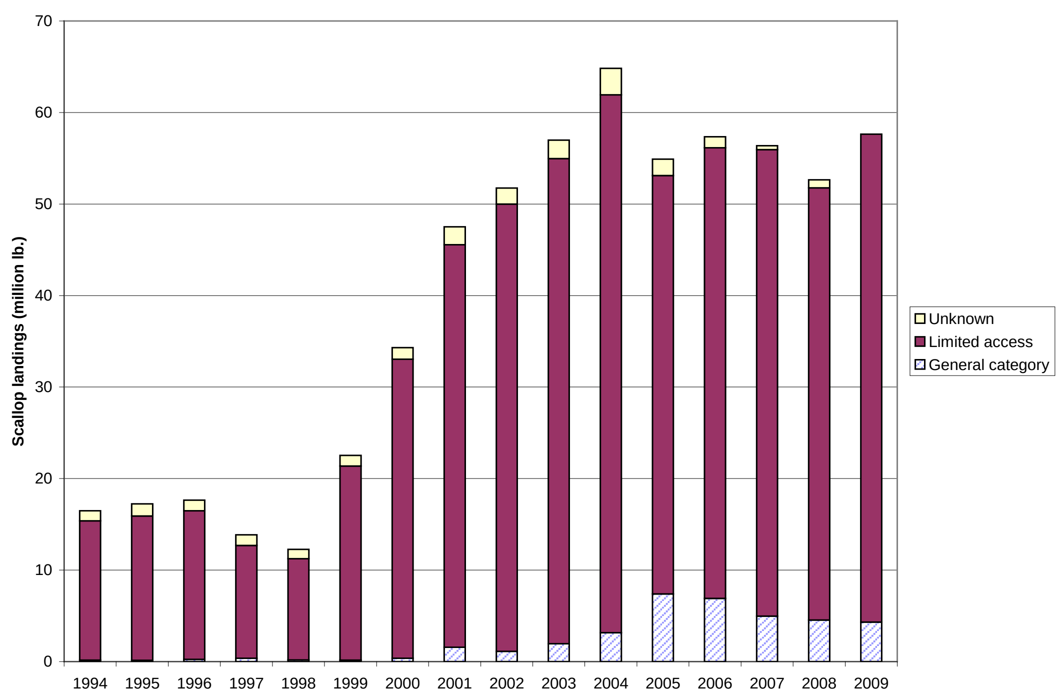


Figure 26 shows that total fleet revenues tripled from about $100 million in 1994 to about $370 million in 2009 (in inflation-adjusted 2008 dollars). Scallop ex-vessel prices increased after 2001 as the composition of landings changed to larger scallops that in general command a higher price than smaller scallops. However, the rise in prices was not the main factor that led to the increase in revenue in the recent years compared to 1994-1998. In fact, inflation adjusted ex-vessel prices in 2008-2009 were lower than prices in 1994 (Figure 26). The increase in total fleet revenue was mainly due to the increase in scallop landings and the increase in the number of active limited access vessels during the same period. Figure 27 shows that average landings and revenue per limited access vessel more than doubled in recent years compared to the period 1994 -1998. The number of active limited access vessels increased by 50% (from about 220 in 1994 to 347 in fishing year 2009) resulting in tripling of total fleet scallop landings and revenue in 2009 compared to 1994 (Figure 27).

Figure 26. Trends in total scallop landings, revenue and ex-vessel price by fishing year (including limited access and general category fisheries, revenues are expressed in 2008 constant prices)

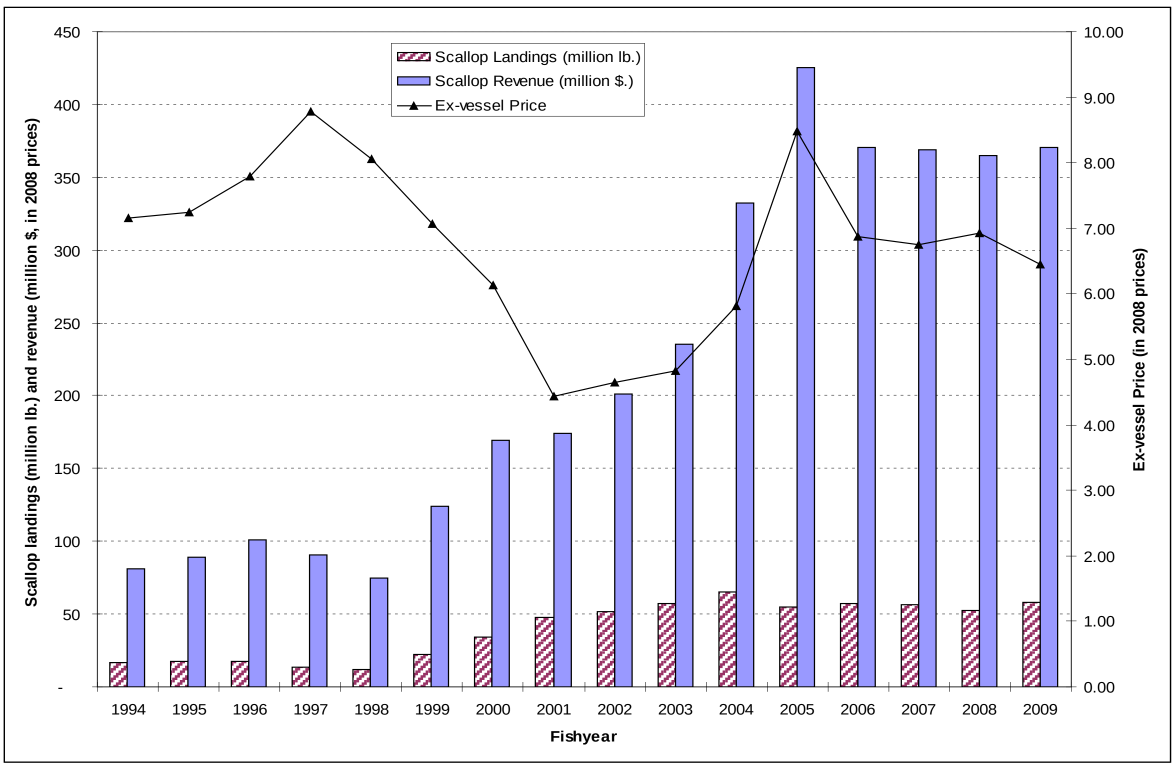
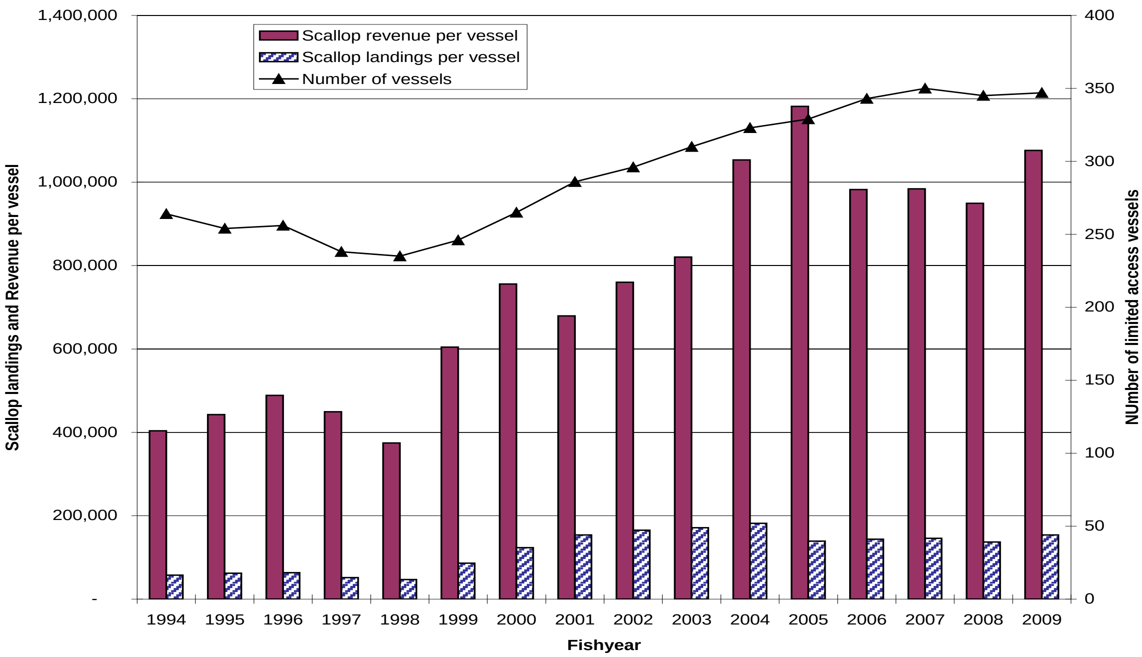


Figure 27. Trends in average scallop landings and revenue per full time vessel and number of active vessels (including full-time, part-time and occasional vessels)



The trends in revenue per full-time vessel were similar to the trends for the fleet as a whole. Figure 27 shows that average scallop revenue per limited access vessel more than doubled from about $400,000 in 1994 to over $1,000,000 despite the fact that inflation adjusted ex-vessel price per pound of scallops was slightly higher in 1994 ($7.15 per pound) compared to the ex-vessel price in 2009 ($6.46 per pound). In other words, the doubling of revenue was the result of the doubling of the average scallop landings per vessel in 2009 (over 153,000 pounds) from its level in 1994 (over 57,000 pounds). The total fleet revenue for all the limited access vessels more than tripled during the same years as new vessels became active. Average scallop revenue per full-time vessel peaked in the 2005 fishing year to over $1.1 million as a result of higher landings combined with an increase in ex-vessel price to about $8.50 per pound of scallops (in terms inflation adjusted 2008 prices).

Table 29 describes the fraction of total landings by area for all limited access vessels from 2004-2009. In general, more and more of the total catch for the fishery is coming from access areas, open area catch has declined from 60% to 71% of total catch in 2004-2004 to just under 40% in 2007 and 2008 and to under 53% in 2009.

Table 29 – Percent of total limited access scallop catch by area and calendar year (Dealer and DAS data)

Access Area	2004	2005	2006	2007	2008	2009
Closed Area 1	0.00%	14.51%	0.00%	9.83%	0.00%	0.00%
Closed Area 2	7.19%	13.87%	27.26%	0.00%	0.00%	6.31%
Delmarva	0.00%	0.00%	0.00%	0.00%	0.00%	10.32%
Elephant Trunk	0.00%	0.00%	0.00%	31.04%	49.91%	30.77%
Hudson Canyon	29.24%	0.00%	0.00%	10.02%	0.00%	0.00%
Nantucket Lightship	3.69%	0.00%	16.49%	10.39%	9.84%	0.00%
OPEN	59.87%	71.62%	56.25%	38.71%	40.24%	52.60%

4.4.3 Trends in effort and LPUE

There has been a steady decline in the total DAS used by the limited access scallop vessels from 1994 to 2000 fishing years as a result of the effort-reduction measures of Amendment 4 (1994). DAS allocations during this period were reduced almost by half from 204 DAS in 1994 to 120 DAS for the full-time vessels and in the same proportions for the part-time and occasional vessels from their base levels in 1994 (Table 30). As a result, DAS used reached the lowest levels of about 23,000 days in the 1999 and 2000 fishing years from about 35,000 days in 1994 (Figure 28).

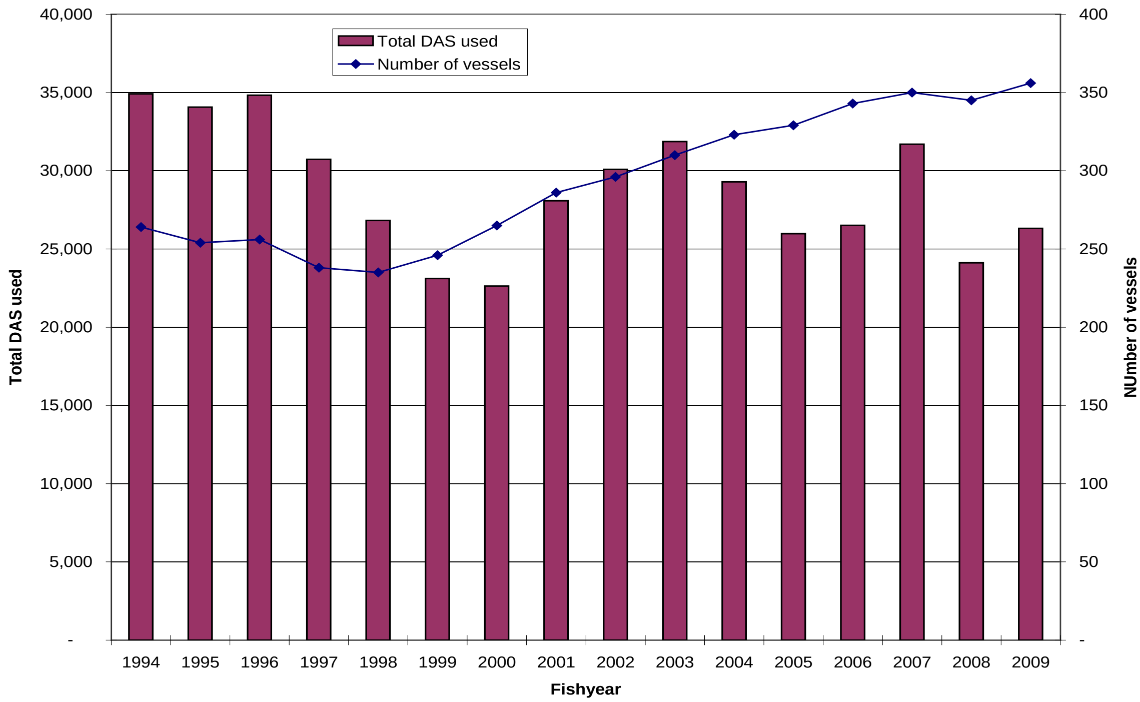
Table 30. DAS and trip allocations per full-time vessel

Year	Allocations based on the Management Action	Total DAS Allocation (1)	Estimated Open area DAS allocations (2)	Access area trip allocations (3)	DAS charge or equivalent per access area trip (4)	Equivalent (estimated) DAS allocation for access areas (5)
1994	Amendment 4	204	None	None		None
1995	Amendment 4	182	None	None		None
1996	Amendment 4	182	None	None		None
1997	Amendment 4	164	None	None		None
1998	Amendment 4	142	None	None		None
1999	Amendment 7 Framework 11	120	90 to 120	3	10	0 to 30
2000	Framework 13	120	60 to 120	6	10	0 to 60
2001	Framework 14	120	90 to 120	3	10	0 to 30
2002	Framework 14	120	90 to 120	3	10	0 to 30
2003	Framework 15	120	90 to 120	3	10	0 to 30
2004	Framework 16	126	42 (MAX.62)	7	12	84
2005	Framework 16	100	40 (MAX.117)	5	12	60
2006	Framework 18	112	52	5	12	60
2007	Framework 18	111	51	5	12	60
2008	Framework 19	95	35	5	12	60
2009	Framework 19	97	37	5	12	60
2010	Framework 21	86	38	4	12	48

Total DAS allocation per full-time vessel represents a rough estimate for years 2004-08 since DAS is allocated for open areas only. DAS allocation for access areas is estimated by assuming an equivalent 12 days-at-sea allocation for each access area trip with a possession limit of 18,000 pounds.

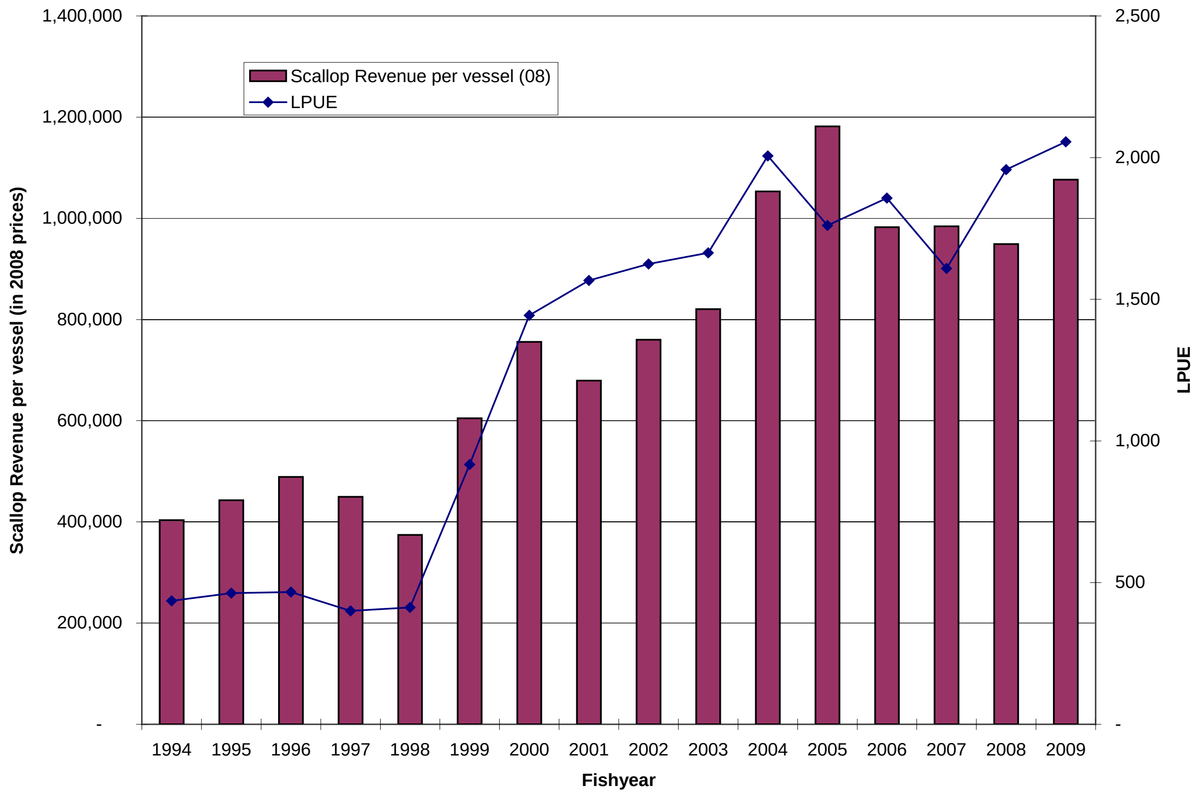
After fishing year 2000, fishing effort started to increase as more limited access vessels participated in the sea scallop fishery. The increase in total effort was mostly due to the increase in the number of vessels because total DAS allocations (mostly less than 120 days) were lower than the DAS allocations in the mid-1990s (over 142 days, Figure 28). The recovery of the scallop resource and the dramatic increase in fishable abundance after 1999 increased the profits in the scallop fishery, thus leading to an increase in participation by limited access vessels that had been inactive during the previous years. Georges Bank closed areas were opened to scallop fishing starting in 1999 by Framework 11 (CAII) and later by Framework 13 (CAII, CAI, NLS), encouraging many vessel owners to take the opportunity to fish in those lucrative areas. Frameworks 14 and 15 provided controlled access to Hudson Canyon and VA/NC areas. As a result, 45 new limited access vessels became active in the sea scallop fishery after 2000 during the next four fishing years. The total number of full-time equivalent vessels reached 310 in 2003 and total fishing effort by the fleet increased to 31,864 days in 2003 from about 22,627 in 2000 (Figure 28).

Figure 28. Total DAS-used and the number of active limited access vessels (including full-time, part-time and occasional vessels) in the sea scallop fishery



Total fishing effort (DAS used) declined after 2003 even though the number of active vessels increased to 343 vessels in 2006 from 310 vessels in 2003. With the implementation of Amendment 10 (2004) the limited access vessels were allocated DAS for open areas and a number of trips for the specific access areas with no open area trade-offs. The open area allocations were reduced to 42 DAS in 2004 whereas full-time vessels were allocated 7 access area trips in the same year (NEFSC, Framework 16). Even though total DAS equivalent allocations remained around the same levels during 2005-2007 (at about 110 equivalent days, Table 30), the fishing effort, i.e., fleet DAS used increased in the 2007 fishing year as many vessels took their unused 2005 HCA trips in that year. If not for those HCA trips, the total effort in the scallop fishery would probably have stayed constant during 2005-2007 with almost all qualified limited access vessels participating in the fishery. Total DAS-used declined further in 2008 to 24,121 days as the open area DAS allocations are reduced by 30% from 51 days to 35 days per full-time vessel, but increased to 26,300 as the limited access vessels received access area trips (5 trips per vessel). The impact of the decline in effort on scallop revenue per vessel was small, however, due to the increase in LPUE from about 1600 pounds per day-at-sea in 2007 to about 1950 pounds per day-at-sea in 2008 and to over 2050 pounds per day-at-sea in 2009 (Figure 29). As a result of the constant increase in LPUE after 1998 from about 450 pounds per DAS in 1994 to over 1500 pounds per DAS after 2003, scallop revenue per vessel more than doubled in recent years compared to the levels in mid 1990s.

Figure 29. LPUE and average scallop revenue per limited access vessel



4.4.4 Trends in the meat count and size composition of scallops

Average scallop meat count has declined continuously since 1999 as a result of effort-reduction measures, area closures, and an increase in ring sizes implemented by the Sea Scallop FMP. The share of larger scallops increased with the share of U10 scallops rising to over 20% during 2006-2008, and to 15% in 2009 compared to less than 10% in 2000-2004. The share of 11-20 count scallops increased from 12% in 1999 to 63% in 2008. On the other hand, the share of 30 or more count scallops declined from 30% in 1999 to 1% in 2008 (Table 31). Larger scallops priced higher than the smaller scallops contributed to the increase in average scallop prices in recent years despite larger landings (Table 32 and Figure 25).

Table 31. Size composition of scallops

YEAR	Under 10 count	11-20 count	21-30 count	30 count and over	Unclassified
1999	17%	12%	25%	35%	12%
2000	7%	18%	44%	20%	11%
2001	3%	24%	49%	11%	13%
2002	5%	15%	65%	5%	11%
2003	6%	21%	56%	3%	13%
2004	7%	41%	42%	2%	8%
2005	13%	57%	21%	2%	7%
2006	23%	52%	18%	1%	6%
2007	24%	52%	13%	4%	8%
2008	23%	53%	18%	1%	4%
2009	15%	63%	19%	0%	2%

Table 32. Price of scallop by market category (in 2008 inflation adjusted prices)

YEAR	<=10 count	11-20 count	21-30 count	>30 count
1999	7.8	7.9	7.3	6.4
2000	8.7	6.8	5.9	6.1
2001	7.2	4.7	4.4	4.7
2002	6.7	4.8	4.5	5.1
2003	5.7	4.8	4.8	5.3
2004	6.8	5.8	5.5	5.7
2005	8.8	8.6	8.5	8.3
2006	6.6	7.3	7.6	7.6
2007	7.2	6.9	6.8	6.2
2008	7.2	6.9	6.8	6.4
2009	8.2	6.5	6.2	6.4

4.4.5 Trends in Foreign Trade

One of most significant change in the trend for foreign trade for scallops after 1999 was the striking increase in scallop exports. The increase in landings especially of larger scallops led to a tripling of U.S. exports of scallops from about 5 million pounds in 1999 to about 25 million pounds per year since 2005 (Figure 30).

Figure 30 shows exports from New England and Mid-Atlantic ports combined including fresh, frozen and processed scallops. Although exports include exports of bay, calico or weathervane scallops, it mainly consists of sea scallops. France and other European countries were the main importers of US scallops. The exports from all other states and areas totaled only about $1 million in 2006 and 2007, and thus were not considered significant. Imports of scallops fluctuated between 45 million pounds and 60 million pounds during the period from 1999 to 2009.

Because of the increase in the value of scallop exports to over $130 million after 2004, the difference in the value of exported and imported scallops, that is scallop trade deficit, declined considerably (Figure 31). Therefore, rebuilding of scallops as a result of the management of the scallop fishery benefited the nation by reducing the scallop trade deficit from over $230 million in 1994 to less than $80 million in 2009.

Figure 30 - Scallop imports and exports (by calendar year)

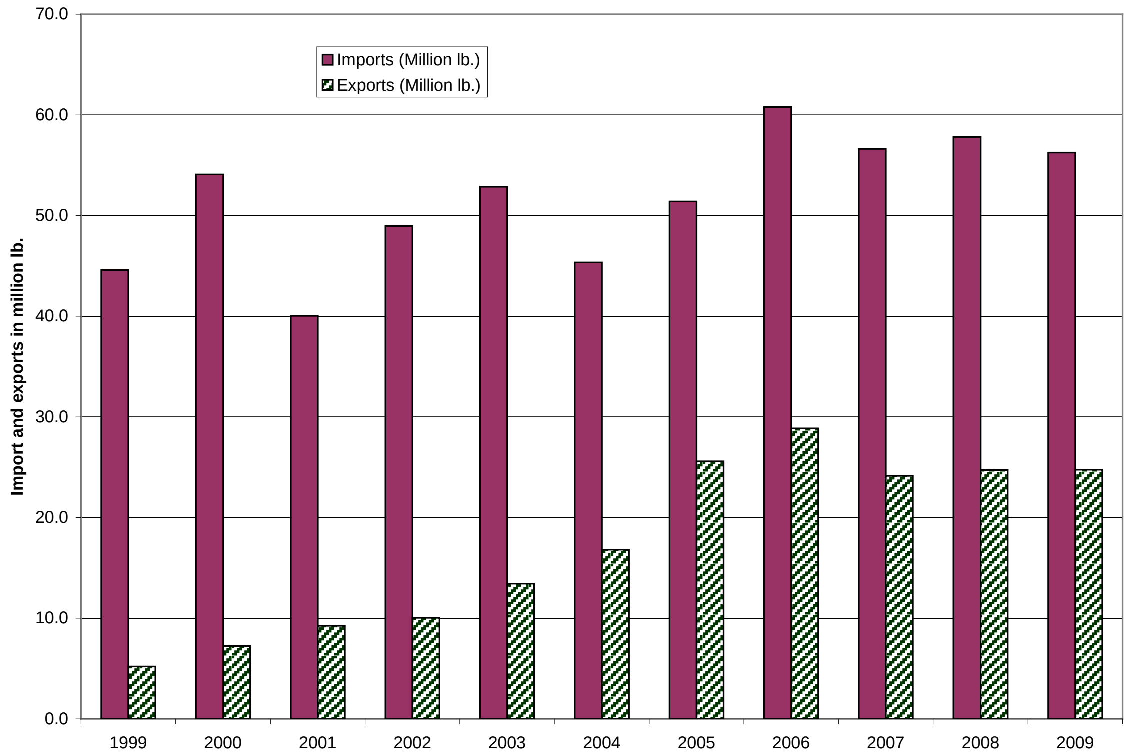
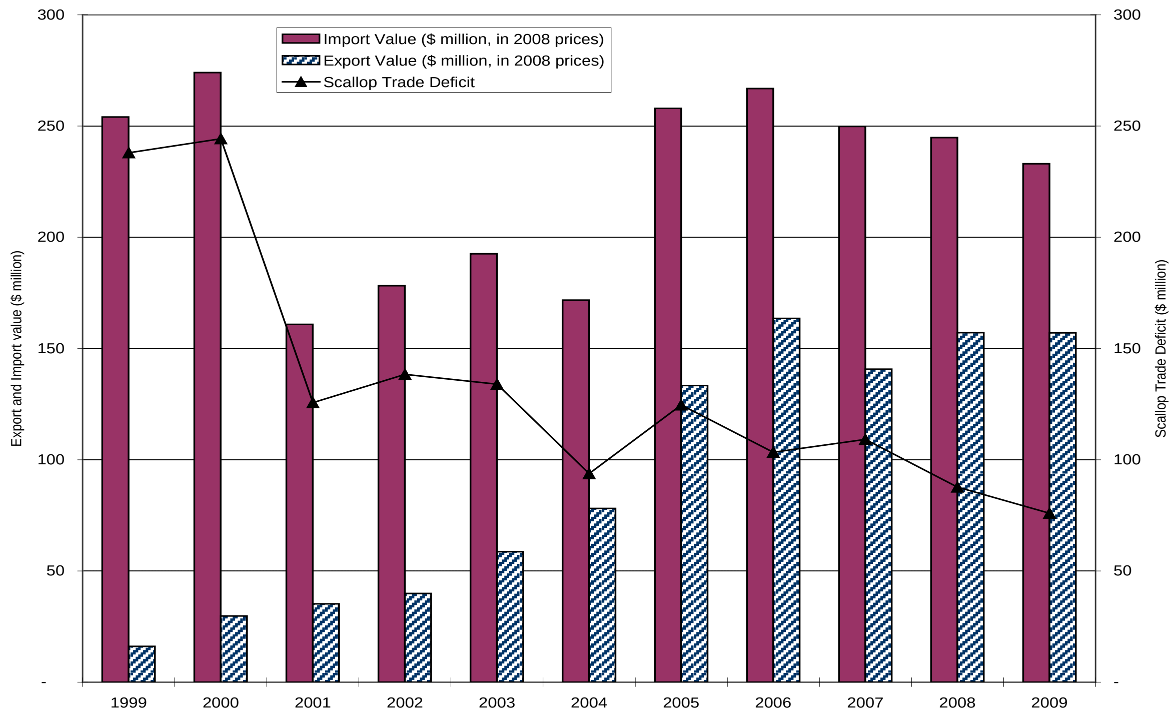


Figure 31. Value of Scallop imports and exports (by calendar year)



4.4.6 The trends in participation by permit, vessel characteristics and gear type

Table 33 shows the number of limited access vessels by permit category from 1999 to 2010. The fishery is primarily full-time, with a small number of part-time permits. There no occasional permits left in the fishery since 2009 because these were converted to part-time small dredge. The number of full-time vessels has been on the rise since 1999. Of these permits, the majority are dredge vessels, with a small amount of full-time small dredge and full-time trawl vessels. The permit numbers shown in Table 33 include duplicate entries because replacement vessels receive new permit numbers and when a vessel is sold, the new owner would get a new permit number. The unique vessels with right-id numbers are shown in Table 34 for 2008-2010. For example, only 347 out of 362 permits in 2008 belonged to unique vessels. Even if the number of permits in 1999 fishing year included only the number of unique vessels, this would mean an increase in the number of limited access vessels by 56 vessels (347-291), or by about 20% since 1999.

Table 35 through Table 41 describe scallop landings by limited access vessels by gear type and permit category. These tables are obtained from the dealer and permit data. Most limited access category effort is from vessels using scallop dredges, including small dredges (Table 38). The number of vessels using scallop trawl gear has decreased continuously and has been at 11 full-time trawl vessels since 2006. In comparison, there has been an increase in the numbers of full-time and part-time small dredge vessels after 2002.

In terms of landings, most scallop landings by the limited access vessels are with dredge gear including the small dredges (Table 35), with significant amounts also landed by full-time and part-time trawls. Table 36 shows the percent of limited access landings by primary gear and year. About 80% of the scallop pounds are landed by full-time dredge and about 13% landed by full-time small dredge vessels since the 2007 fishing year.

Table 33. Number of limited access vessels by permit category and gear

Permit category	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Full-time	213	220	224	234	238	242	248	255	256	254	259	252
Full-time small dredge	1	3	13	25	39	48	57	59	63	56	55	54
Full-time net boat	16	17	16	16	16	15	19	14	12	11	12	11
Total full-time	230	240	253	275	293	305	324	328	331	321	326	317
Part-time	12	16	14	14	10	4	3	3	2	2	3	3
Part-time small dredge	3	4	6	8	19	26	30	34	35	32	34	35
Part-time trawl	22	20	18	10	8	3	-	-	-	-	-	-
Total part-time	37	40	38	32	37	33	33	37	37	34	37	38
Occasional	4	4	5	4	3	3	1	2	1	1	-	-
Occasional trawl	20	16	19	15	8	5	5	-	-	-	-	-
Total occasional	24	20	24	19	11	8	6	2	1	1	1	1
Total Limited access	291	300	315	326	342	346	363	367	369	356	362	354

Note: The permit numbers above include duplicate entries because replacement vessels receive new permit numbers and when a vessel is sold, the new owner would get a new permit number.

Table 34. Scallop Permits by unique right-id and category by application year

Permit category	2008	2009	2010
Full-time	250	250	250
Full-time small dredge	52	52	52
Full-time net boat	11	11	11
Total full-time	**313**	**313**	**313**
Part-time	2	2	2
Part-time small dredge	31	32	32
Part-time trawl	0	0	0
Total part-time	**33**	**34**	**34**
Occasional	1	0	0
Total Limited access	347	347	347

Table 35. Scallop landings (lbs) by limited access vessels by permit category and gear

FISHYEAR	FT Dredge	PT Dredge	FT SMD	PT SMD	FT TRW	PT TRW	OC TRW
1994	12,927,171	90,409	45,787	3,279	1,586,390	313,405	74,749
1995	13,760,573	205,147	NA	NA	1,477,777	140,282	45,409
1996	14,185,830	259,791	NA	4,695	1,282,612	379,459	93,375
1997	11,096,201	148,742		16,896	773,273	237,763	7,089
1998	9,502,888	84,929	NA	NA	1,111,118	315,627	NA
1999	18,895,722	303,397	NA	NA	1,382,335	520,689	15,950
2000	28,992,280	658,551	NA	NA	1,871,048	661,936	14,284
2001	38,728,109	861,087	765,341	183,880	2,578,316	744,057	17,140
2002	42,260,391	918,534	1,824,090	161,157	2,980,542	587,012	32,026
2003	45,461,777	932,815	3,112,784	523,538	2,612,065	272,668	381
2004	48,809,720	338,649	5,654,387	835,495	2,432,866	125,917	17,615
2005	37,960,280	290,222	4,749,421	1,477,081	1,097,019		NA
2006	40,808,025	NA	5,325,485	1,400,217	1,210,658		
2007	40,401,524	NA	6,634,241	1,520,113	1,647,474		
2008	37,948,082	NA	6,185,988	1,334,990	1,536,814		
2009*	36,776,722	NA	6,135,801	1,214,674	1,732,518		

**Preliminary*

NA = Landings are not shown if the number of vessels in a cell is less than 3 to protect confidentiality

Table 36. Percentage of limited access scallop landings (lbs) by permit category and gear

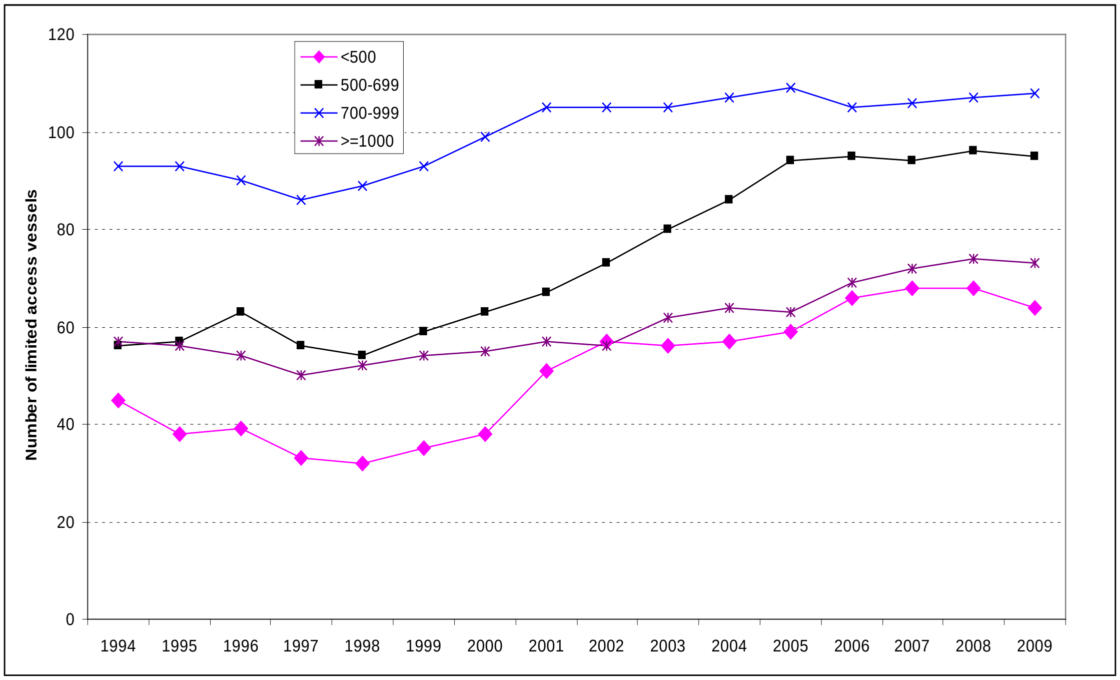
FISHYEAR	FT Dredge	PT Dredge	FT SMD	PT SMD	FT TRW	PT TRW	OC TRW
1994	85.9%	0.6%	0.3%	0.0%	10.5%	2.1%	0.5%
1995	87.7%	1.3%	NA	NA	9.4%	0.9%	0.3%
1996	87.4%	1.6%	NA	0.0%	7.9%	2.3%	0.6%
1997	90.4%	1.2%	0.0%	0.1%	6.3%	1.9%	0.1%
1998	86.2%	0.8%	NA	NA	10.1%	2.9%	NA
1999	89.4%	1.4%	NA	NA	6.5%	2.5%	0.1%
2000	89.8%	2.0%	NA	NA	5.8%	2.1%	0.0%
2001	88.3%	2.0%	1.7%	0.4%	5.9%	1.7%	0.0%
2002	86.7%	1.9%	3.7%	0.3%	6.1%	1.2%	0.1%
2003	85.9%	1.8%	5.9%	1.0%	4.9%	0.5%	0.0%
2004	83.8%	0.6%	9.7%	1.4%	4.2%	0.2%	0.0%
2005	83.3%	0.6%	10.4%	3.2%	2.4%	0.0%	NA
2006	83.6%	NA	10.9%	2.9%	2.5%	0.0%	0.0%
2007	80.1%	NA	13.2%	3.0%	3.3%	0.0%	0.0%
2008	80.4%	NA	13.1%	2.8%	3.3%	0.0%	0.0%
2009*	79.8%	NA	13.3%	2.6%	3.8%	0.0%	0.0%

**Preliminary*

NA = Landings are not shown if the number of vessels in a cell is less than 3 to protect confidentiality

Horsepower of permitted vessels in the limited access fleet ranges from <500 hp to greater than 1000 hp. The majority of the small dredges had a horsepower of less than 500. Majority of the limited access vessels had a horse power of 700 to 999 HP. The number of vessels that had a horsepower of 1000 or more has increased, especially since 2005. The overall fleet horsepower average has been on the rise but, like fleet size, shows signs of leveling off in the most recent years of data (Figure 32).

Figure 32. Number of limited access vessels by horsepower (including full-time, part-time and occasional vessels



In contrast, most of the general category scallop vessels are small boats with a horsepower less than 500 (Figure 33). The number of active general category vessels increased sharply after 2000 fishing year, but has been falling down as a result of the qualification measures included in Amendment 11 to the sea scallop FMP.

Figure 33. Number of general category vessels by horsepower (including full-time, part-time and occasional vessels

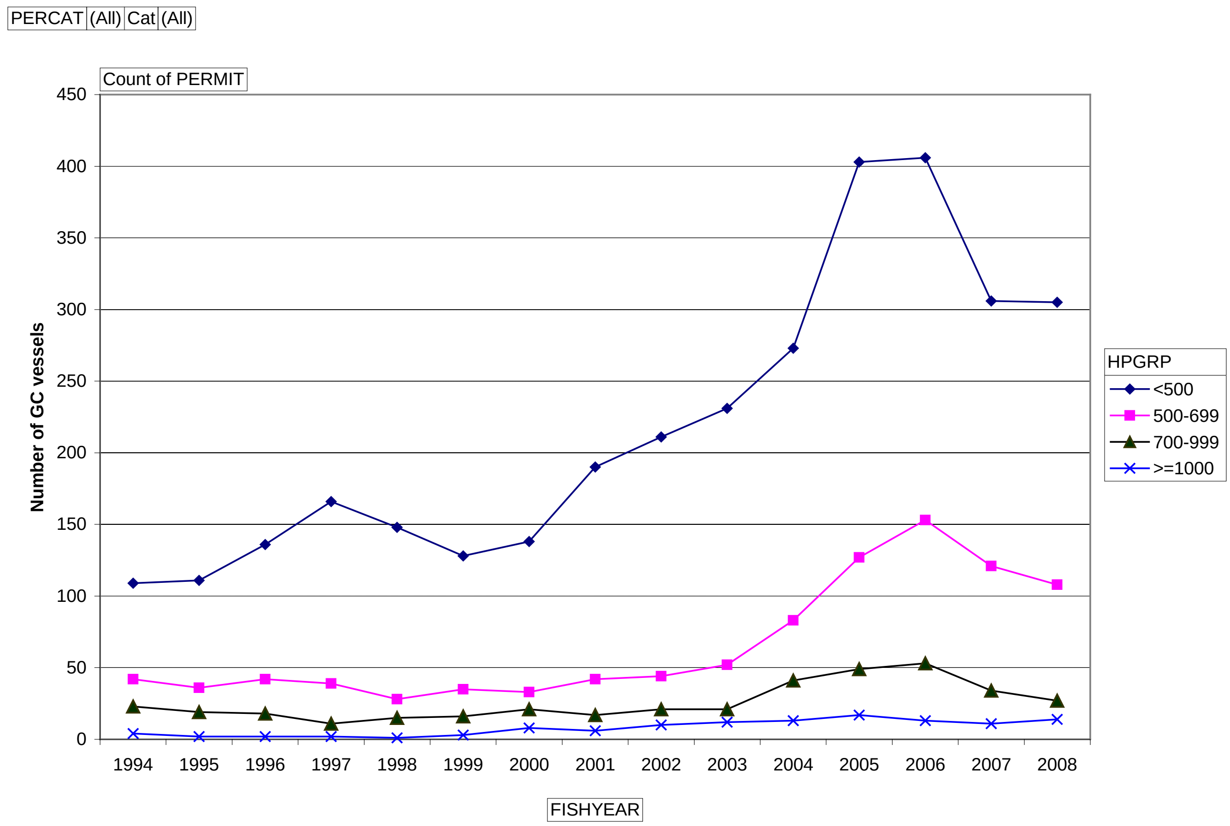


Table 38 through Table 41 describe general category landings by gear type. These tables are generated by VTR data and since not all VTR records include gear information, the number of vessels in these tables will differ from other tables that summarize general category vessels and landings from dealer data. Primary gear is defined as the gear used to land more than 50% of scallop pounds. Most general category effort is and has been from vessels using scallop dredge and other trawl gear (Table 38). The number of vessels using scallop trawl gear increased through 2006 but has declined in recent years. In terms of landings, most scallop landings under general category are with dredge gear (Table 39), with significant amounts also landed by scallop trawls and other trawls. Table 41 shows the percent of general category landings by primary gear and year. The percentages of scallop landings with other trawl gear in 2008 and 2009 were the highest they have been since 2001, but still significantly less than dredge.

Both full-time and part-time limited access vessels had a high dependence on scallops as a source of their income and the majority of the full-time (96%) and the part-time vessels (71%) derived more than 90% of their revenue from the scallop fishery during 2008-2009 (Table 37). Section 5.7 (Impact on other Fisheries) and subsection 5.7.3.1 of Amendment 15 provide detailed information on the composition of revenue and revenues from other species for the LA vessels.

The current data on the scallop landings and revenue by the limited access general category vessels is less than perfect, however. One reason for this is that many general category vessels also have limited access permits and their landings and revenues are summed up in the dealer data. It is also possible that a permit number for a limited access vessel is given to a general category vessel when the former vessel is replaced by another vessel. Another reason is that although the limited access general category vessels were allowed to land no more than 400lbs of scallops per trip, many of these trips are summed up together in the dealer data making it hard to separate general category trips form the limited access trips by the full-time and part-time vessels. For these reasons, the data provided in Table 40 based on the assumption that all the trips by vessels with a general category permit and with a maximum landing of 4000 lbs belong to vessels to limited access permit holders. This assumption produced reasonable results in terms of total general category landings (in excess of 4million lbs in 2008-2009). The results again shows that the majority (more than 70%) of the limited access general category IFQ and the general category NGOM permit holders derived more than 90% of their revenues from the scallop fishery (Table 40). Therefore, except for the limited access general category incidental permit holders that are permitted land no more than 40 lbs of scallops in each trip), scallop fishing is an important source of income for the majority of vessels in the scallop fishery. The increase in scallop prices resulted in higher revenues for all participants and increased the share of scallops in their total income. For the limited access general category vessels the percentage of the total revenue from scallops will likely to decline in 2010 because these vessels were allocated about 10% of the total TAC in 2008-2009 but were allocated 5.5% of the total TAC starting with 2010 according to the provisions of Amendment 11. Section 4.4.6 of Amendment 15 provides information on the composition of revenues for the limited access general category vessels and discusses some of the data limitations. The composition of revenue for the general category vessels are shown in Table 42.

Table 37. Dependence of scallop revenue by limited access vessels

Permit category	Scallop revenue as a % of total	2008		2009	
		Number of vessels	% of total vessels	2009	Number of vessels
FT	<75%	7	2%	6	2%
	75%-89%	7	2%	17	5%
	>=90%	315	96%	310	93%
Total		329	100%	333	100%
PT	<75%	7	17%	13	32%
	75%-89%	5	12%	3	7%
	>=90%	29	71%	25	61%
Total		41	100%	41	100%

Table 38. Number of general category vessels by primary gear and fishing year

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	*	33	4	42	*
1995	4	91	5	48	4
1996	7	101	13	49	*
1997	6	118	9	55	UNK
1998	10	100	8	52	*
1999	10	87	3	61	5
2000	7	78	9	91	3
2001	4	122	7	118	6
2002	3	147	3	104	9
2003	6	155	2	116	17
2004	8	217	10	183	35
2005	26	280	3	183	60
2006	29	366	9	159	65
2007	26	280	4	125	30
2008	9	129	5	66	21
2009	8	117	*	53	22

** indicates 3 or less vessels*
UNK - value unknown

Table 39. General category scallop landings by primary gear (pounds)

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	111	144,139	260	9,564	2,601
1995	4,812	501,910	1,146	43,585	11,797
1996	1,352	578,884	3,314	19,460	1,644
1997	3,253	682,270	3,465	30,227	*
1998	6,049	334,930	2,443	19,677	3,750
1999	18,322	236,482	599	17,537	3,970
2000	6,446	303,168	1,411	173,827	8,179
2001	91,939	1,254,153	6,518	404,709	28,276
2002	21,888	1,266,144	919	74,686	41,977
2003	22,614	1,590,575	484	171,511	196,376
2004	36,260	2,624,753	2,259	487,620	373,980
2005	198,736	4,934,735	1,441	744,027	892,154
2006	198,400	5,607,142	8,386	418,708	599,508
2007	142,044	4,517,800	724	226,131	395,683
2008	87,186	2,593,870	1,502	528,252	287,362
2009	63,368	1,940,047	400	574,555	211,598

** Value unknown*

Table 40. Dependence of scallop revenue by limited access general category vessels

Permit category	Scallop revenue as a % of total	2008		2009	
		Number of vessels	% of total vessels	2009	Number of vessels
LAGC- IFQ	<10%	33	14%	21	9%
	10%-49%	11	5%	9	4%
	50%-74%	5	2%	5	2%
	75%-89%	16	7%	12	5%
	>=90%	176	73%	194	80%
Total		241	100%	242	100%
LAGC-NGO	<10%	34	13%	24	9%
	10%-49%	9	3%	4	2%
	50%-74%	6	2%	5	2%
	75%-89%	17	6%	13	5%
	>=90%	196	74%	211	80%
Total		265	100%	263	100%

Source: Dealer data

Table 41. Percentage of general category scallop landings by primary gear

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	0.07%	92.00%	0.17%	6.10%	1.66%
1995	0.85%	89.11%	0.20%	7.74%	2.09%
1996	0.22%	95.74%	0.55%	3.22%	0.27%
1997	0.45%	94.86%	0.48%	4.20%	*
1998	1.65%	91.30%	0.67%	5.36%	1.02%
1999	6.62%	85.40%	0.22%	6.33%	1.43%
2000	1.31%	61.49%	0.29%	35.26%	1.66%
2001	5.15%	70.24%	0.37%	22.67%	1.58%
2002	1.56%	90.08%	0.07%	5.31%	2.99%
2003	1.14%	80.27%	0.02%	8.66%	9.91%
2004	1.03%	74.46%	0.06%	13.83%	10.61%
2005	2.94%	72.88%	0.02%	10.99%	13.18%
2006	2.90%	82.07%	0.12%	6.13%	8.77%
2007	2.69%	85.53%	0.01%	4.28%	7.49%
2008	2.49%	74.15%	0.04%	15.10%	8.21%
2009	2.27%	69.54%	0.01%	20.59%	7.58%

** Value unknown*

Table 42. Composition of Revenue for the Limited Access general category vessels

type			2008	2009	2010 (YTD)
LAGC-IFQ	Sea Scallops	Value	54,893,231	62,649,588	19,258,744
		% of total	56.7	61.6	65.2
LAGC-IFQ	Haddock	Value	4,650,763	5,154,400	2,525,802
		% of total	4.8	5.1	8.6
LAGC-IFQ	Cod	Value	4,896,581	4,003,189	1,196,895
		% of total	5.1	3.9	4.1
LAGC-IFQ	Summer Flounder	Value	3,661,464	3,971,164	1,381,125
		% of total	3.8	3.9	4.7
LAGC-IFQ	Winter Flounder	Value	4,163,718	3,764,240	518,436
		% of total	4.3	3.7	1.8
LAGC-IFQ	Ocean Quahog	Value	3,791,416	2,913,891	.
		% of total	3.9	2.9	.
LAGC-IFQ	Monkfish	Value	3,734,324	2,288,828	542,626
		% of total	3.9	2.2	1.8
LAGC-IFQ	Yellowtail Flounder	Value	1,690,474	1,579,854	606,050
		% of total	1.7	1.6	2.1
LAGC-NGO	Sea Scallops	Value	22,567,094	28,040,044	12,354,379
		% of total	60.1	59.8	73.2
LAGC-NGO	Cod	Value	3,052,147	3,718,290	1,224,251
		% of total	8.1	7.9	7.3
LAGC-NGO	Atlantic Herring	Value	2,990,716	2,550,620	351,237
		% of total	8.0	5.4	2.1
LAGC-NGO	Monkfish	Value	1,768,256	1,734,338	649,427
		% of total	4.7	3.7	3.8
LAGC-NGO	Pollock	Value	1,158,016	1,664,891	273,895
		% of total	3.1	3.6	1.6
LAGC-NGO	Lobster	Value	1,931,352	1,659,344	152,091
		% of total	5.1	3.5	0.9
LAGC-NGO	Yellowtail Flounder	Value	370,510	407,139	128,884
		% of total	1.0	0.9	0.8

4.4.7 Trends in ownership patterns in the scallop fishery

Limited access vessels

According to the ownership data for 2008, only 75 out of 346 vessels were owned by one person and/or cooperation (Table 43). The rest were owned by several individuals and/or different corporations with ownership interest in more than one vessel. This factor makes it difficult assigning each vessel to a specific group of owners. The following tables were generated by selecting a primary owner for each group of vessels that are owned by multiple individuals/entities based on the maximum number of vessels owned by one person/entity. For example, if Mr. A and Mrs. B were listed as the joint owners of the same 5 vessels, but Mrs. B was also listed as an owner of additional two vessels, Mrs. B has been assigned as the primary owner of these 7 vessels. Therefore, each owner group in Table 43 includes more than one person (usually several family members), who collectively own the corresponding number of vessels. For example, in the 16 to 17 category, 4 different sets of owners own 56 boats with each of the 4 sets containing multiple individuals/entities.

Because there were overlaps with owners for multiple vessels, such that two people has ownership interest in 5 boats, primary ownership was assigned to one person in 3 out of 5 boats, and the other person was assigned the 2 remaining boats. Another example includes common ownership of a vessel, with each individual also owning another vessel: Vessel A was owned by Mr. A, but Mr. A also owned another boat, Vessel B together with Mr. B, who owned 5 boats. As a result, vessel B was assigned to Mr. B because he is a 5 boat owner. But Mr. A can stack his DAS allocation on vessel B because he has an ownership interest in it. As a result, therefore, Mr. A was classified as a multi-boat owner even though only one vessel's ownership (Vessel A) was assigned to him.

Table 43 shows that only 22% of the limited access vessels were owned by one person, whereas 16% of the vessels are owned by 4 separate entities (group of individuals). The concentration of ownership could be even more than shown in Table 43 because not all family relationships could be taken into account according to the method applied above. The owners of 16 to 17 vessels (4 entities) landed about 16% of scallops in 2008 fishing year, and owners of 6 to 9 vessels (11 separate entities) landed over 21% of scallops in the same fishing year, amounting to over 37% of the scallops landings by these two groups (Table 44). The landings by single boat owners amounted to about 20% of the total fleet landings in 2008.

Table 43. Owner groups according to the number of vessels with ownership interest

Owner group according to number of vessels owned	Number of owners	Number of vessels	Number of vessels owned as a % of all vessels
1	75	75	22%
2	26	52	15%
3	10	29	8%
4	10	37	11%
5	5	23	7%
6 to 9	11	74	21%
16 to 17	4	56	16%
Grand Total	141	346	100%

Table 44. Percentage of Scallop landings by limited access vessels according to the number of vessels owned and fishyear

Number of vessels owned in 2008	2005	2006	2007	2008	2009
1	18.34%	20.15%	19.88%	20.09%	19.25%
2	9.81%	10.39%	10.15%	11.70%	11.53%
3	9.13%	9.91%	10.86%	10.67%	10.97%
4	10.75%	9.71%	10.90%	11.39%	11.00%
5	4.35%	5.16%	5.31%	5.53%	6.29%
6-9	21.15%	21.87%	22.18%	21.56%	20.43%
16-17	16.48%	16.02%	16.08%	16.16%	15.60%
Unknown	9.99%	6.78%	4.64%	2.90%	4.93%
Grand Total	100.00%	100.00%	100.00%	100.00%	100.00%

General category vessels

Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices (Table 45 and Table 46). This additional effort was likely a contributing factor to why the FMP has been exceeding the fishing mortality targets.

Table 45. General category landings before and after Amendment 11 implementation

Fishyear	General category scallop landings (Million lbs)	% of Total Scallop Landings
1994	0.2	1.0%
1995	0.1	0.8%
1996	0.2	1.4%
1997	0.4	2.7%
1998	0.2	1.5%
1999	0.2	0.7%
2000	0.4	1.1%
2001	1.6	3.3%
2002	1.1	2.2%
2003	2.0	3.4%
2004	3.2	4.9%
2005	7.4	13.5%
2006	6.9	12.0%
2007	5.0	8.8%
2008	4.5	8.6%
2009	4.3	7.5%

Amendment 11 implemented a limited entry program for the general category fishery allocating 5% of the total projected scallop catch to the general category vessels qualified for limited access. The main objective of the action was to control capacity and mortality in the general category scallop fishery. There is also a separate limited entry program for general category fishing in the Northern Gulf of Maine. In addition, a separate limited entry incidental catch permit was adopted that will permit vessels to land and sell up to 40 pounds of scallop meat per trip while fishing for other species. During the transition period to the full-implementation of Amendment 11, the general category vessels were allocated 10% of the scallop TAC. Since the full implementation of Amendment 11 provisions did not occur until March 2010, it is too early to assess the impacts this amendment on the ownership patterns in the general category vessels. Table 46 shows, however, that the number of general category permits declined considerably after 2007 as a result of the Amendment 11 provisions. Although not all vessels with general category permits were active in the years preceding 2008, there is no question that the number of vessels (and owners) that hold a limited access general category permit under the Amendment 11 regulations are less than the number of general category vessels that were active prior to 2008 (Table 46).

Table 46. General category permit before and after Amendment 11 implementation

AP_YEAR	Scallop landings (Million lbs)	Number of active General category vessels	General category permit (up to 2008)	Number of permits qualify under Amendment 11 program			Grand Total
				Limited access general category (A)	Limited access NGOM permit (B)	Incidental catch permit (C)	
2000	0.37	212	2263				2263
2001	1.58	290	2378				2378
2002	1.11	315	2512				2512
2003	1.95	348	2574				2574
2004	3.16	433	2827				2827
2005	7.40	611	2950				2950
2006	6.90	661	2712				2712
2007	4.96	495	2493				2493
2008	4.55	428		342	99	277	718
2009	4.69			404	136	331	871
2010*				316	120	294	730

* *Preliminary*

4.4.8 Trends in scallop landings by port communities

The landed value of scallops by port landing fluctuated from 1994 through 1998 for many ports. During the past six years, six ports brought in the most landed value: New Bedford, MA; Cape May, NJ; Newport News, VA; Barnegat Light/Long Beach, NJ, Seaford, VA, and Hampton, VA (Table 47). In addition to bringing in the most landed value, in 1994 scallop landings represented more than 30% of the total landed value for New Bedford, MA and Cape May, NJ, and more than 65% of the total landed value for Newport News and Hampton, VA (Table 48). This increased in 2008 to 74% and 84% for New Bedford, MA and Cape May, NJ, respectively, and 93% and 84% for Newport News and Hampton, VA, respectively.

Landed value has increased steadily from 1999-2009; but, some leveling off is apparent in recent years (Table 47). In the most recent two years of data (2007-2008), 43% of ports saw a decrease in the percentage of landed scallop value to total landed value (Table 48). However, many of these decreases are very small, on the order of 1-3%. Between 2003 and 2005, 10 ports increased their landed value for scallops, potentially from an increase in general category landings. The average landed value has increased from $2 million in 1994 to a peak of $12 million in 2005. In 2006-2008, the average landed value has hovered between $9 and $10 million.

Table 47. Landed value of scallops (in dollars), with percentage total landed value by port of landing, FY 2000-2009.

C.R. = confidential data, with landings that are greater than 100,000 but less than 1.25 million, X* = less than 70,000. Data from 1994-1999 can be found in NEFSC, 2009 and NEFSC, 2010.

Port	ST	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
							Landed value of scallops				
New Bedford	MA	83,006,586	81,908,700	96,577,150	102,785,405	140,199,026	212,648,543	216,822,155	204,474,764	176,086,743	183,959,258
Cape May	NJ	13,863,015	18,383,891	19,806,595	27,651,212	45,642,540	51,509,961	23,655,758	42,153,448	56,004,411	53,142,451
Newport News	VA	22,991,894	24,216,571	30,674,642	34,823,672	50,118,455	40,825,309	23,315,283	32,928,813	36,567,248	34,910,323
Barnegat Lt/Lg. Beach	NJ	6,341,192	7,233,544	7,932,205	9,493,730	14,650,066	21,446,855	17,840,906	15,939,038	17,061,549	16,049,848
Seaford	VA	10,416,415	10,272,414	12,402,860	12,414,595	18,116,274	17,134,740	12,534,007	14,271,808	14,360,003	14,597,444
Hampton	VA	8,061,268	9,167,502	13,182,503	19,157,183	19,855,846	15,116,820	9,254,379	15,007,603	14,115,580	12,832,253
Fairhaven	MA	0	0	C.R.	0	0	5,084,470	10,298,480	8,245,589	9,737,822	10,642,200
Point Pleasant	NJ	3,785,210	3,038,990	3,562,956	4,327,226	3,127,130	8,114,727	7,865,402	8,182,964	8,526,965	10,138,072
New London	CT	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	3,188,683	4,569,078
Stonington	CT	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	5,615,982	4,381,095
Avalon	NJ	0	0	0	0	0	C.R.	1,617,315	3,218,069	2,416,042	3,808,963
Wildwood	NJ	118,219	1,244,301	2,021,926	2,032,996	3,518,411	4,064,869	2,202,817	3,499,585	3,638,704	3,464,599
Ocean City	MD	107,905	85,868	91,794	213,621	417,278	4,266,837	6,192,358	2,796,864	3,713,025	3,152,937
Point Lookout	NY	0	0	0	0	C.R.	25,910	12,150	1,002,947	3,073,060	2,495,417
Newport	RI	699,275	C.R.	2,439	C.R.	904,494	8,643,740	13,267,494	6,049,259	776,770	1,577,167
Montauk	NY	6,176	7,281	470	784	434,753	1,325,910	1,867,319	2,130,279	1,147,639	1,405,719
Atlantic City	NJ	0	C.R.	0	C.R.	266,656	1,887,273	2,242,501	2,737,202	1,647,595	1,288,271
Lowland	NC	0	C.R.	C.R.	0	C.R.	5,955	C.R.	C.R.	C.R.	C.R.
Engelhard	NC	C.R.	C.R.	0	137,805	9,998	138,227	311,182	709,366	C.R.	809,064
Chincoteague	VA	209,477	803,195	1,115,438	1,887,873	4,111,305	11,423,253	7,717,070	1,166,229	489,280	807,251
Point Judith	RI	654,097	674,427	79,899	276,634	599,248	4,615,001	7,381,664	2,839,617	1,388,029	758,732
Hampton Bays	NY	179,869	695,465	87,231	163,129	248,278	1,700,156	1,011,294	406,965	598,425	746,677
Chatham	MA	C.R.	585,375	111,182	415,840	1,913,246	2,984,215	3,128,854	2,068,853	1,780,119	591,582
Lubec	ME	0	0	C.R.	0	C.R.	0	C.R.	C.R.	C.R.	C.R.
Provincetown	MA	85,178	2,046,225	660,936	570,196	609,343	1,673,982	1,113,298	615,021	349,928	491,115
Sandwich	MA	156,016	173,681	282,333	262,675	166,634	228,835	343,031	745,140	327,636	488,617
Gloucester	MA	1,003,130	1,328,695	968,504	574,314	609,224	1,027,671	1,117,031	518,877	394,747	188,642
Indian River	DE	0	0	0	0	0	C.R.	115,744	C.R.	245,064	173,301
Stonington	ME	C.R.	C.R.	241,417	109,350	C.R.	C.R.	C.R.	C.R.	42,476	C.R.
Freeport	NY	C.R.	0	2,310	C.R.	C.R.	C.R.	C.R.	C.R.	10,382	159,501
Wellfleet	MA	C.R.	65,563	31,632	112,228	32,757	296,551	56,919	171,325	216,523	141,887
Bucks Harbor	ME	0	0	0	C.R.	0	0	C.R.	C.R.	101,360	138,293
Shinnecock	NY	0	0	0	0	0	318,636	216,853	28,864	133,608	134,191
Oriental	NC	8,667	C.R.	6,466	26,121	135,572	528,847	225,637	135,161	C.R.	128,296
Wanchese	NC	5,456	1,401,202	1,029,898	263,522	379,020	68,140	136,774	3,608	C.R.	126,561
Belford	NJ	C.R.	2,331	0	0	0	32,618	C.R.	12,103	551,746	117,887
Woods Hole	MA	0	0	C.R.	0	21,154	139,275	58,387	15,521	11,207	117,400
Addison	ME	0	0	0	0	0	0	0	178,728	275,102	110,324
Perry	ME	0	0	0	0	C.R.	0	0	C.R.	0	C.R.
Pembroke	ME	0	0	0	0	C.R.	0	0	80,067	102,466	C.R.

Port	ST	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
		Percentage of the landed value of scallops to total landed value in port									
New Bedford	MA	56	54	57	58	68	75	77	77	73	75
Cape May	NJ	58	68	70	76	75	82	68	80	81	80
Newport News	VA	87	81	89	91	93	94	93	90	91	95
Barnegat Lt/Lg. Beach	NJ	43	50	54	58	71	80	73	69	75	74
Seaford	VA	99	99	100	100	100	100	100	99	100	100
Hampton	VA	74	74	80	83	79	73	76	78	82	79
Fairhaven	MA	0	0	C.R.	0	0	63	90	90	87	77
Point Pleasant	NJ	21	16	18	19	17	38	35	36	39	49
New London	CT	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	73	89
Stonington	CT	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	C.R.	69	70
Avalon	NJ	.	.	.	.	0	C.R.	99	98	98	100
Wildwood	NJ	3	21	29	32	46	80	74	90	96	97
Ocean City	MD	2	1	1	3	1	41	46	26	34	32
Point Lookout	NY	.	0	0	.	C.R.	3	1	54	82	80
Newport	RI	8	C.R.	0	C.R.	11	61	64	49	11	22
Montauk	NY	0	0	0	0	3	8	11	12	7	9
Atlantic City	NJ	0	C.R.	0	C.R.	2	10	9	10	7	6
Lowland	NC	0	C.R.	C.R.	.	C.R.	2	C.R.	C.R.	C.R.	C.R.
Engelhard	NC	C.R.	C.R.	0	5	0	6	9	10	C.R.	18
Chincoteague	VA	9	31	39	46	57	78	73	28	13	26
Point Judith	RI	2	2	0	1	2	12	16	8	4	2
Hampton Bays	NY	2	8	1	3	4	23	14	7	11	14
Chatham	MA	C.R.	5	1	4	18	20	19	14	12	5
Lubec	ME	.	0	C.R.	0	C.R.	0	C.R.	C.R.	C.R.	C.R.
Provincetown	MA	2	36	17	16	18	35	30	17	11	14
Sandwich	MA	3	3	4	4	3	4	8	20	11	18
Gloucester	MA	2	4	2	2	1	2	2	1	1	0
Indian River	DE	0	0	0	0	0	C.R.	23	C.R.	47	38
Stonington	ME	C.R.	C.R.	1	1	C.R.	C.R.	C.R.	C.R.	0	C.R.
Freeport	NY	C.R.	0	0	C.R.	C.R.	C.R.	C.R.	C.R.	2	26
Wellfleet	MA	C.R.	25	10	25	8	9	1	5	6	4
Bucks Harbor	ME	0	.	0	C.R.	0	0	C.R.	C.R.	3	6
Shinnecock	NY	0	0	0	0	0	48	30	4	16	22
Oriental	NC	0	C.R.	0	3	6	29	9	3	C.R.	7
Wanchese	NC	0	13	11	3	2	1	1	0	C.R.	1
Belford	NJ	C.R.	0	0	0	0	1	C.R.	0	18	5
Woods Hole	MA	0	0	C.R.	0	3	22	10	10	1	12
Addison	ME	0	0	0	0	0	0	0	3	7	3
Perry	ME	.	.	.	.	C.R.	.	0	C.R.	0	C.R.
Pembroke	ME	.	.	.	.	C.R.	.	.	38	46	C.R.

Table 48. Percentage of landed value of scallops to total landed value by port of landing, FY 1994-2008

* Includes only ports of landings with landed value of scallops in excess of $100,000 during FY2008. Data run August 98, 2009, based on dealer weighout data YTD.

Port Name	County	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
NEW BEDFORD	BRISTOL	39	41	45	44	36	53	57	53	58	58	70	75	77	76	74
CAPE MAY	CAPE MAY	33	33	35	29	23	44	59	68	69	76	75	81	71	80	80
NEWPORT NEWS	NEWPORT NEWS (CITY)	67	71	76	73	73	79	86	84	89	92	92	94	92	90	93
BARNEGAT LIGHT/LONG BEACH	OCEAN	28	29	32	30	26	30	47	47	57	60	73	78	73	69	75
SEAFORD	YORK	.	.	.	95	94	98	99	100	100	100	100	100	99	99	100
HAMPTON	HAMPTON (CITY)	71	66	63	47	55	61	73	75	82	83	76	74	74	78	84
FAIRHAVEN	BRISTOL	.	.	.	.	.	0	0	0	0	0	0	65	90	90	87
POINT PLEASANT	OCEAN	2	5	10	13	10	10	21	17	18	18	19	39	34	38	40
STONINGTON	NEW LONDON	.	.	24	39	38	35	36	52	67	77	82	71	66	78	68
WILDWOOD	CAPE MAY	0	0	0	0	0	0	3	21	32	32	51	82	75	90	96
OCEAN CITY	WORCESTER	0	0	1	0	0	0	2	1	1	3	0	42	45	26	35
POINT LOOKOUT	NASSAU	.	.	.	.	.	.	.	0	0	0	3	4	0	58	80
AVALON	CAPE MAY	.	.	.	.	.	.	.	.	.	.	0	99	99	98	98
NEW LONDON	NEW LONDON	.	.	0	0	0	21	32	24	21	22	21	29	34	39	73
CHATHAM	BARNSTABLE	0	0	0	0	0	0	1	5	1	4	18	19	19	14	11
ATLANTIC CITY	ATLANTIC	0	0	0	0	0	0	0	0	0	0	2	12	8	10	8
OTHER CONNECTICUT	NOT-SPECIFIED	1	4	0	0	0	0	0	0	0	0	0	0	0	24	46
POINT JUDITH	WASHINGTON	0	0	0	0	0	0	2	2	0	1	2	12	16	8	4
MONTAUK	SUFFOLK	0	0	0	0	0	0	0	0	0	0	3	9	11	12	9
ENGELHARD	HYDE	.	.	0	0	0	0	0	2	0	5	1	5	8	10	12
NEWPORT	NEWPORT	0	2	1	10	7	5	8	0	0	0	16	59	64	49	12
HAMPTON BAYS	SUFFOLK	0	0	0	0	0	1	4	5	1	2	8	23	12	7	12
BELFORD	MONMOUTH	0	0	0	1	0	0	0	0	0	0	0	1	2	1	17
OTHER ATLANTIC	ATLANTIC	12	0	0	0	0	0	0	0	0	0	0	6	35	38	27
CHINCOTEAGUE	ACCOMACK	0	0	0	0	0	0	10	33	39	47	54	78	75	27	14
NEW HAVEN	NEW HAVEN	.	.	0	0	0	0	0	0	0	0	0	0	0	0	85
GLOUCESTER	ESSEX	0	0	1	1	0	1	2	4	2	1	2	2	2	1	1
SANDWICH	BARNSTABLE	1	1	8	3	9	6	3	4	4	4	2	4	9	20	11
PROVINCETOWN	BARNSTABLE	2	1	4	4	4	2	3	38	13	19	18	35	28	17	10
OTHER CAPE MAY	CAPE MAY	0	0	0	0	0	0	0	0	1	0	0	1	35	8	22
INDIAN RIVER	SUSSEX	.	.	0	0	0	0	0	0	0	0	0	11	23	0	47
WELLFLEET	BARNSTABLE	.	0	16	23	35	31	7	34	11	25	7	9	2	4	7
OTHER MONMOUTH	MONMOUTH	0	0	0	0	0	0	0	0	0	0	0	1	2	46	4
HYANNISPORT	BARNSTABLE	.	.	.	.	.	.	.	.	.	.	9	19	20	10	9
ADDISON	WASHINGTON	.	.	.	.	.	0	0	0	0	0	0	0	1	5	4
NANTUCKET	NANTUCKET	8	1	3	1	1	0	15	0	0	0	9	19	12	9	9
HARWICH PORT	BARNSTABLE	0	0	0	0	0	0	0	9	2	14	19	25	6	14	10
WANCHESE	DARE	.	.	0	1	0	0	0	13	11	3	3	1	1	0	1
SHINNECOCK HILLS	SUFFOLK	0	0	0	0	0	0	0	0	0	0	4	45	31	6	15
BUCKS HARBOR	WASHINGTON	0	0	0	0	0	0	0	0	0	1	0	0	42	0	3
BARNSTABLE	BARNSTABLE	.	.	0	0	0	0	0	0	0	0	2	11	29	19	5
FALMOUTH	BARNSTABLE	0	0	0	0	0	0	0	0	17	9	0	7	3	14	6

Table 49. Landed Value of scallops, linked to Vessel Homeport, ranked by fishing year 2008.

Table only includes ports with either more than $1M in 2008 landed value, or more than $250K in landed value with at least 10% port total scallops. X = confidential, less than 1M; XX = confidential, more than 1M. Data run, August 9, 2009.

Port	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
NEW BEDFORD	28300	32429	39317	31568	25804	44363	59779	65845	79089	88962	126049	159634	145917	156801	145392
CAPE MAY	6979	7453	7528	7957	5876	10546	16725	17891	23178	30267	46347	63443	59236	72497	62532
NEWPORT NEWS	1840	2250	2547	3263	3495	9017	12438	14089	16328	16788	22516	24306	20803	21774	18929
BARNEGAT LIGHT	3041	3370	3297	2821	2335	4406	6676	6978	7811	9853	15276	19351	15873	16626	16503
NORFOLK	14803	15818	16234	14093	10970	14765	18015	14287	16563	17464	20074	13893	11111	12474	11390
NEW BERN	X	X	X	X	837	2322	2650	3292	4235	6431	7885	7747	8314	12106	10785
WANCHESE	46	14	3	1	485	1	816	2769	3378	4401	5707	6652	4990	7053	6559
NEW LONDON	0	0	0	0	0	0	X	0	0	X	X	2296	4389	3131	5799
FAIRHAVEN	2708	3245	4453	4318	3720	6776	11794	6628	7133	7214	9021	10669	8406	7503	5415
POINT PLEASANT	953	977	1179	1504	1016	1386	2232	2374	2588	2938	3896	6835	6441	5532	5043
LOWLAND	6	120	445	0	X	963	1466	1786	2176	2897	3834	6114	4439	4579	4692
SEAFORD	X	X	X	0	0	0	0	X	2399	3452	3874	4551	2693	5540	4603
STONINGTON	0	1	0	536	73	0	X	698	1471	852	1270	3	59	464	4337
HAMPTON	4113	4413	4001	3014	2602	3704	4998	4103	4318	3742	6815	3576	5424	5213	4030
ATLANTIC CITY	X	X	X	X	X	0	X	X	0	2	96	3657	3484	3945	3154
ORIENTAL	X	X	174	X	890	1627	1776	1260	2059	3688	4397	7161	4572	4333	3151
POINT PLEASANT BEACH	X	0	0	0	0	X	X	X	X	X	456	1147	720	1589	2725
CAPE CANAVERAL	X	X	X	X	X	X	X	X	XX	1673	2380	3651	2574	2260	2441
MONTAUK	X	0	X	1	0	3	65	19	6	X	116	1206	386	2535	2386
BEAUFORT	42	X	X	X	0	X	X	244	256	67	289	1953	855	1473	2240
BARNSTABLE	2227	1968	1368	650	396	384	891	939	970	798	1152	2017	2649	2476	2164
CARROLLTON	X	X	X	X	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
WILDWOOD	4	5	149	X	X	X	805	1001	843	792	1855	2464	1559	1952	1776
GLOUCESTER	171	11	317	372	251	986	636	597	757	846	1681	2262	1654	1387	1449
BAYBORO	X	X	X	X	X	X	X	671	998	1512	2141	809	1235	1643	XX
BEDFORD	X	X	X	X	X	X	X	XX	X	XX	XX	XX	XX	XX	XX
BOSTON	265	334	454	454	162	449	512	706	880	1021	639	XX	1037	719	XX
CHATHAM	0	0	0	0	0	X	0	296	42	273	478	1285	1557	1723	1120
MANAHAWKIN	0	0	0	0	0	0	0	0	0	0	0	XX	XX	XX	XX
SOUTHWEST HARBOR	168	405	521	482	282	763	1086	590	529	674	X	XX	XX	XX	XX
TREMONT	X	X	X	338	226	X	X	X	554	787	1051	XX	XX	XX	X
AURORA	X	X	X	X	X	X	X	X	X	XX	XX	XX	XX	XX	X
SUFFOLK	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X
PLYMOUTH	X	X	X	66	12	X	X	X	126	X	253	1568	845	1678	960
NEWPORT	X	X	X	X	X	X	X	X	X	X	X	X	891	X	X
OCEAN CITY	0	0	0	0	0	0	0	0	X	0	X	X	X	X	X
KEY WEST	X	0	0	X	0	0	0	0	X	X	X	X	X	X	X
JACKSONVILLE	X	0	0	X	X	X	X	X	X	0	X	1414	XX	X	X
TILGHMAN ISLAND	0	0	0	0	0	0	0	0	0	0	0	590	859	483	800
OWLS HEAD	X	235	87	X	X	X	X	516	395	371	347	682	487	239	745
OCEAN CITY	X	11	1	X	0	X	7	23	27	14	583	1906	1887	737	725
HAMPTON BAYS	3	4	19	7	5	7	320	307	42	80	398	1235	763	379	509
WESTPORT	0	0	0	0	0	0	0	0	0	0	30	420	491	555	421
SWAN QUARTER	0	0	X	X	X	X	827	X	X	749	1509	2775	941	444	404
PROVINCETOWN	15	27	72	86	36	72	96	1867	352	351	391	1495	932	811	381
TOMS RIVER	0	0	0	0	0	0	0	X	X	X	X	0	X	X	X
NANTICOKE	0	0	0	0	0	0	0	0	0	0	0	X	X	X	X
POINT LOOKOUT	0	0	X	X	0	X	0	0	0	0	19	X	X	X	X
GLOUCESTER POINT	0	0	0	0	0	0	0	0	0	0	0	0	X	X	X
GALLOWAY	0	0	0	0	0	0	0	0	0	0	0	0	0	X	X
SCRANTON	0	0	0	0	0	0	0	0	0	X	X	X	X	X	X
BELMAR	X	0	0	0	0	0	0	0	0	0	0	187	250	X	X
HULL	0	0	0	0	0	0	0	X	X	X	X	X	X	X	X
NEW YORK	0	0	0	X	0	X	X	X	X	X	X	0	X	0	X

The largest numbers of permitted limited access scallop vessels currently are in the ports of New Bedford, MA and Cape May, NJ, which represent 37% and 19% of the total, respectively (Table 50). Of the 348 permitted limited access vessels in 2009, 203 originate from New Bedford, MA and Cape May, NJ. Although the number of permitted limited access vessels has only increased from 308 in 1994 to a peak of 380 in 2005 and New Bedford has always had the largest number of permitted limited access vessels, the port with the next greatest number of contributors shifted from Norfolk, VA (18% in 1994 to 3% in 2009) to Cape May, NJ (9% in 1994 to 19% in 2009).

In addition to having the greatest number of permitted limited access scallop vessels, New Bedford, MA also has the greatest number of general category scallop vessels. Cape May, NJ, Barnegat Light, NJ, and Gloucester, MA also have high numbers of general category scallop vessels. Generally, ports that had a higher number of general category scallop vessels from 1994-2004, such as New Bedford, Gloucester, and Chatham, have seen a significant decrease in these vessels in recent years (Table 51).

Although the largest increases in general category vessels have been from ports in NC, they have increased from 1 or no permitted general category scallop vessels to only about 6 or 7, which results in a 600-700% increase. Regardless of this increase, these ports only had a landed value for scallops of $311,000 or less (Table 47). Other ports that saw an increase of 300% in general category vessels, such as Chincoteague, VA and Barnegat Light, NJ (Table 51), had a landed value of $7.3 million and $16.9 million, respectively (Table 47). Although some ports such as New Bedford and Gloucester have experienced a decline in the number of general category scallop vessels, the simultaneous increase in permitted limited access boats has aided to increase the landed value of scallops in those ports to $202.5 million and $812,000 respectively. As Table 51shows, the general category fleet is not homogeneous, but varies over space and time, with some ports showing a general category fleet that mirrors limited access vessels in size (for example Atlantic City NJ), and others showing a fleet of smaller-scale vessels (such as Fairhaven, MA). Thus impacts to the general category fishery as a whole can be experienced differently in different ports.

Table 50. Permitted limited access scallop vessels, by homeport, 1994-2009.

Homeport	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
New Bedford, MA (Bristol county)	94	91	79	75	73	78	81	96	105	110	115	130	136	136	137	136
Cape May, NJ (Cape May county)	33	31	31	33	33	34	38	39	45	53	58	72	71	75	70	67
Newport News, VA (Newport News City)	8	9	10	10	12	17	19	21	21	21	22	23	19	19	18	18
Barnegat Light, NJ (Ocean county)	9	9	9	9	8	8	10	10	9	11	13	12	11	11	11	11
New Bern, NC (Craven county)	1	2	2	4	4	6	6	8	8	8	8	13	13	14	11	11
Norfolk, VA (Norfolk City)	65	67	63	58	51	42	35	27	27	27	22	13	12	11	11	11
Wanchese, NC (Dare county)	4	3	2	2	2	1	4	8	7	7	6	6	8	8	8	8
Lowland, NC (Pamlico county)	6	6	7	6	6	8	7	7	7	8	9	8	8	8	7	7
Hampton, VA (Hampton City)	15	15	11	11	8	7	6	6	6	6	7	5	7	7	7	6
Seaford, VA (York county)	1	1	1	0	0	0	0	2	3	4	4	5	6	5	5	6
Beaufort, NC (Carteret county)	6	6	3	2	1	1	1	1	1	0	0	0	0	1	2	5
Fairhaven, MA (Bristol county)	12	13	10	10	13	12	15	11	9	9	8	9	8	6	5	5
New London, CT (New London county)	0	0	0	0	0	1	1	1	1	1	1	3	5	5	5	5
Point Pleasant, NJ (Ocean county)	6	6	5	5	4	4	4	4	4	4	4	4	4	4	6	5
Oriental, NC (Pamlico county)	2	2	3	2	4	5	4	5	5	7	9	9	14	11	7	4
Stonington, CT (New London county)	3	3	5	6	6	4	5	7	7	8	8	4	4	5	4	4
Atlantic City, NJ (Atlantic county)	0	0	0	0	0	0	0	0	0	0	0	1	2	2	3	3
Montauk, NY (Suffolk county)	1	0	0	0	0	0	0	0	0	0	0	1	0	2	3	3
Narragansett, RI (South county)	2	2	3	3	3	4	4	3	3	3	2	3	4	4	3	3
Barnstable, MA (Barnstable county)	12	9	9	4	2	1	1	1	1	1	2	2	2	2	2	2
Bayboro, NC (Pamlico county)	1	1	1	3	1	2	2	2	4	3	3	2	3	2	2	2
Cape Canaveral, FL (Brevard county)	3	4	4	3	3	1	2	3	2	2	2	2	2	2	2	2
Carrollton, VA (Isle Of Wight county)	2	3	2	1	2	2	3	2	2	2	2	2	2	2	2	2
Owls Head, ME (Knox county)	2	3	2	2	2	2	3	3	3	2	2	2	2	2	2	2
Plymouth, MA (Plymouth county)	2	0	0	0	0	0	0	0	0	0	1	2	3	3	2	2
Swan Quarter, NC (Hyde county)	1	1	1	1	1	2	2	2	3	3	3	3	1	1	2	2
Wildwood, NJ (Cape May county)	5	5	4	3	3	2	2	2	2	2	2	2	4	2	2	2
Bedford, MA (Middlesex county)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Boston, MA (Suffolk county)	1	1	2	3	3	2	2	2	2	2	1	1	1	1	1	1
Essex, CT (Middlesex county)	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Jacksonville, FL (Duval county)	1	0	0	1	1	1	1	1	1	0	1	1	1	1	1	1
Key West, FL (Monroe county)	0	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1
Manahawkin, NJ (Ocean county)	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
Newport, NC (Carteret county)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ocean City, MD (Worcester county)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Point Pleasant Beach, NJ (Ocean county)	0	0	0	0	0	1	1	1	1	1	1	1	2	1	2	1
Poquoson, VA (York county)	0	0	0	0	0	2	2	1	1	2	2	2	2	2	1	1
Southwest Harbor, ME (Hancock county)	6	3	4	3	2	2	2	2	2	2	1	1	1	1	1	1
Suffolk, VA (Suffolk (City) county)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Tremont, ME (Hancock county)	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
Westport, MA (Bristol county)	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Table 51. Permitted general category scallop vessels, by homeport, 2005-2009. All ports that had at least 1 GC permit in 2009 are included.

Port	County	State	2005	2006	2007	2008	2009
NEW BEDFORD	PLYMOUTH	MA	86	88	83	67	72
CAPE MAY	SUFFOLK	MA	30	48	54	25	28
BARNEGAT LIGHT	HANCOCK	ME	29	30	31	28	27
GLOUCESTER	HANCOCK	ME	38	49	55	23	26
POINT PLEASANT	WASHINGTON	ME	17	22	24	14	15
PROVINCETOWN	PLYMOUTH	MA	14	16	15	11	11
HAMPTON BAYS	BARNSTABLE	MA	13	21	21	7	10
NEW BERN	PLYMOUTH	MA	5	6	5	5	10
NARRAGANSETT	DARE	NC	37	44	50	5	8
CHATHAM	OCEAN	NJ	23	27	29	7	7
STONINGTON	BRISTOL	MA	16	19	15	5	7
BELHAVEN	SAGADAHOC	ME	12	9	8	5	6
SEABROOK	CARTERET	NC	2	4	9	4	6
SOUTH BRISTOL	WICOMICO	MD	6	8	7	6	6
BEAUFORT	BEAUFORT	NC	14	14	14	4	5
ENGELHARD	CRAVEN	NC	7	8	7	5	5
LOWLAND	GLOUCESTER	VA	5	5	5	2	5
OCEAN CITY	SUSSEX	DE	12	17	15	4	5
PORTLAND	CARTERET	NC	24	22	19	6	5
RYE	DUVAL	FL	3	6	8	3	5
BOSTON	MONMOUTH	NJ	13	11	13	3	4
HAMPTON	SUFFOLK	NY	7	7	6	4	4
MONTAUK	ROCKINGHAM	NH	17	17	20	5	4
NEWBURYPORT	NEWPORT	RI	6	7	5	4	4
POINT PLEASANT BEACH	WASHINGTON	ME	3	3	2	5	4
PORT CLYDE-TENANTS HARBOR	DARE	NC	2	2	6	4	4
PORTSMOUTH	CARTERET	NC	12	12	12	6	4
ROCKPORT	CUMBERLAND	NJ	3	5	5	4	4
SCITUATE	SUFFOLK	NY	8	7	8	4	4
NEW YORK	DUVAL	FL	2	3	3	2	3
NORFOLK	YORK	ME	7	7	5	3	3
TILGHMAN ISLAND	NEW LONDON	CT	7	10	9	3	3
WANCHESE	NEWPORT	RI	14	13	10	4	3
WILDWOOD	CAPE MAY	NJ	5	5	6	4	3
WOODS HOLE	NASSAU	NY	3	4	5	5	3
ATLANTIC CITY	ATLANTIC	NJ	20	22	17	2	2
FRIENDSHIP	WASHINGTON	ME	2	3	3	3	2
KENNEBUNKPORT	ATLANTIC	NJ	0	0	0	2	2
MARSHFIELD	HAMPTON (CITY)	VA	2	3	3	2	2
MILLVILLE	SUFFOLK	NY	1	3	4	2	2
MOUNT DESERT	CUMBERLAND	ME	1	1	1	3	2
NEW LONDON	SUFFOLK	NY	6	8	6	2	2
NEWPORT NEWS	YORK	ME	6	5	6	2	2
SACO	WASHINGTON	ME	0	1	2	2	2
SALISBURY	SUSSEX	NJ	1	2	3	2	2
SHALLOTTE	CHARLESTON	SC	2	2	2	2	2
STEUBEN	MONMOUTH	NJ	2	3	3	2	2
SWAN QUARTER	CRAVEN	NC	5	9	7	2	2
WELLFLEET	NEWPORT NEWS (CIT	VA	5	4	5	2	2
WILMINGTON	CAPE MAY	NJ	6	6	5	2	2
YORK HARBOR	NEW CASTLE	DE	0	1	1	2	2
BARNSTABLE	OCEAN	NJ	9	9	9	1	1

Port	County	State	2005	2006	2007	2008	2009
BATH	OCEAN	NJ	2	3	3	1	1
BELMAR	PAMLICO	NC	2	2	1	1	1
BREMEN	BEAUFORT	NC	2	4	3	1	1
CAPE CANAVERAL	SUFFOLK	MA	7	6	5	2	1
CAPE MAY COURT HOUSE	BARNSTABLE	MA	1	1	1	1	1
CHEBEAGUE ISLAND	FAIRFIELD	CT	0	2	0	1	1
CUSHING	CAPE MAY	NJ	2	2	2	1	1
CUTLER	CAPE MAY	NJ	2	3	5	2	1
EAST CENTRAL WASHINGTON	CUMBERLAND	ME	1	1	1	1	1
EASTPORT	MOBILE	AL	0	2	2	1	1
FAIRHAVEN	KNOX	ME	6	6	4	2	1
GLOUCESTER COURTHOUSE	HANCOCK	ME	0	0	0	1	1
GREEN HARBOR-CEDAR CREST	WICOMICO	MD	0	2	4	1	1
HAMPTON FALLS	WASHINGTON	ME	1	1	1	1	1
HARPSWELL	DUKES	MA	8	14	16	1	1
HARWICH PORT	HYDE	NC	5	8	6	0	1
HULL	BRISTOL	MA	1	1	1	1	1
KITTERY	SAGADAHOC	ME	5	6	6	1	1
LEWES	CARTERET	NC	3	3	3	1	1
LUBEC	PAMLICO	NC	9	7	4	2	1
LYNN	PLYMOUTH	MA	0	0	0	1	1
MACHIASPORT	SUFFOLK	NY	6	6	7	3	1
MANAHAWKIN	SUFFOLK	NY	0	0	0	1	1
MARSHALLBERG	ROCKINGHAM	NH	1	1	2	1	1
MONTVILLE	HANCOCK	ME	0	0	0	1	1
MOREHEAD CITY	CUMBERLAND	ME	1	1	1	1	1
NANTICOKE	BARNSTABLE	MA	1	2	2	1	1
NASSAWADOX	MONMOUTH	NJ	1	2	1	1	1
NEPTUNE	PAMLICO	NC	1	1	1	1	1
NEWPORT	WASHINGTON	ME	12	13	12	1	1
OCEAN BLUFF-BRANT ROCK	SUSSEX	DE	2	1	2	1	1
ORIENTAL	CUMBERLAND	ME	5	13	8	1	1
OWLS HEAD	PAMLICO	NC	3	6	5	3	1
PHIPPSBURG	WASHINGTON	ME	0	1	1	1	1
PLYMOUTH	HILLSBOROUGH	FL	8	9	12	1	1
POINT LOOKOUT	ESSEX	MA	1	2	2	1	1
PORT NORRIS	PLYMOUTH	MA	7	7	7	2	1
RICHLANDS	SUFFOLK	NY	0	0	0	0	1
ROCKLAND	CUMBERLAND	NJ	4	7	3	1	1
SCRANTON	NEW LONDON	CT	1	1	1	2	1
SOUTH THOMASTON	WASHINGTON	RI	0	1	0	1	1
SOUTHAMPTON	WASHINGTON	RI	1	1	1	1	1
SOUTHPORT	NORTHAMPTON	VA	0	0	0	1	1
SPRUCE HEAD	MONMOUTH	NJ	0	0	0	0	1
SWAMPSCOTT	BRISTOL	MA	2	1	1	1	1
TANGIER	NEW LONDON	CT	1	1	1	1	1
TOMS RIVER	NEW YORK	NY	0	1	1	1	1
TOWNSEND	NEW YORK	NY	2	2	3	2	1
TREMONT	ESSEX	MA	1	0	1	1	1
WAKEFIELD-PEACEDALE	NEW CASTLE	DE	3	3	3	1	1
WEST SAYVILLE	SUFFOLK	NY	0	0	0	0	1
WESTPORT	PLYMOUTH	MA	7	7	7	1	1
WINTER HARBOR	WORCESTER	MD	3	5	6	2	1

Table 52. Average GRT (gross registered tons), average length, and number of permitted scallop vessels by top 20 homeports, 1994-2008.

			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Atlantic, NC	Limited access	Avg. Length	78	81	81	81	81	81	81	81	81	81	81	81	81	.	.
		Avg. GRT	168	168	168	168	168	168	168	168	168	168	168	168	168	.	.
		No. permits	3	3	3	3	3	3	3	3	3	3	3	3	3	0	0
	General Category	Avg. Length	73	70	70	68	68	68	63	63	63	63	63	54	63	.	.
		Avg. GRT	108	108	108	100	100	100	75	75	75	75	75	48	75	.	.
		No. permits	3	3	3	4	4	4	1	1	1	1	1	2	1	0	0
Atlantic City, NJ	Limited access	Avg. Length	.	.	.	.	.	.	.	.	.	.	.	75	75	75	75
		Avg. GRT	.	.	.	.	.	.	.	.	.	.	.	125	121	123	123
		No. permits	.	.	.	.	.	.	.	.	.	.	.	1	2	3	3
	General Category	Avg. Length	59	56	54	64	62	60	61	78	83	81	77	81	83	59	59
		Avg. GRT	73	62	62	99	90	84	90	124	145	139	121	119	128	68	68
		No. permits	5	6	5	7	9	12	11	18	23	22	26	35	37	2	2
Aurora, NC	Limited access	Avg. Length	75	75	75	75	75	83	68	73	73	56	73	73	73	68	.
		Avg. GRT	116	116	116	116	116	133	114	125	125	85	125	125	125	114	.
		No. permits	2	2	2	2	2	1	1	2	2	3	2	2	2	1	0
	General Category	Avg. Length	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		Avg. GRT	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
		No. permits	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Barnegat Light, NJ	Limited access	Avg. Length	69	69	69	69	69	69	65	65	69	68	68	67	67	67	67
		Avg. GRT	117	117	117	117	110	110	97	97	108	107	107	102	101	101	101
		No. permits	9	9	9	9	8	8	10	10	9	11	13	12	11	11	11
	General Category	Avg. Length	63	59	50	58	60	52	51	52	52	53	52	49	50	55	56
		Avg. GRT	91	79	44	63	73	53	48	56	54	54	50	38	40	57	58
		No. permits	9	14	10	12	11	27	35	48	51	59	63	63	62	28	27
Barnstable, MA	Limited access	Avg. Length	79	82	81	68	70	70	78	78	78	78	70	70	70	70	70
		Avg. GRT	128	141	133	80	96	90	89	89	89	89	76	76	76	76	76
		No. permits	11	9	9	4	2	1	1	1	1	1	2	2	2	2	2
	General Category	Avg. Length	45	42	41	39	40	43	40	40	41	42	42	39	40	42	42
		Avg. GRT	42	36	33	29	27	31	26	25	25	26	27	21	23	27	27
		No. permits	21	25	23	20	22	22	23	29	29	23	22	19	16	1	1
Cape	Limited access	Avg. Length	73	72	72	73	73	81	83	79	76	76	76	76	76	76	76
		Avg. GRT	136	132	132	136	136	175	160	142	140	140	140	140	140	140	140

			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
		No. permits	3	4	4	3	3	1	2	3	2	2	2	2	2	2	2
	General Category	Avg. Length	81	.	.	.	.	.	.	.		74	67	69	65	74	68
		Avg. GRT	175	.	.	.	.	.	.	.	.	108	93	98	92	108	111
		No. permits	1	.	.	.	.	.	.	.	.	2	8	10	9	2	1
Cape May, NJ	Limited access	Avg. Length	82	82	83	82	81	80	80	80	78	74	74	74	75	77	77
		Avg. GRT	151	152	155	149	148	146	145	146	143	132	130	128	131	135	133
		No. permits	33	31	31	33	33	34	38	39	45	53	58	72	71	70	67
	General Category	Avg. Length	77	78	78	67	72	67	63	60	61	54	56	52	55	68	73
		Avg. GRT	126	130	137	109	122	104	92	88	81	65	63	56	62	93	118
		No. permits	30	28	28	29	26	36	42	43	42	48	63	73	82	25	28
Fairhaven, MA	Limited access	Avg. Length	86	87	88	89	89	91	89	89	87	87	90	89	89	98	98
		Avg. GRT	158	158	160	166	164	171	172	166	158	158	168	162	161	185	185
		No. permits	12	13	10	10	13	12	15	11	9	9	8	9	8	5	5
	General Category	Avg. Length	43	42	45	43	42	43	46	45	45	46	46	46	45	80	94
		Avg. GRT	31	29	36	31	29	31	38	42	40	41	39	34	32	155	192
		No. permits	22	19	21	27	28	22	22	23	26	30	27	26	27	2	1
Hampton, VA	Limited access	Avg. Length	78	78	77	77	77	76	77	77	77	76	76	75	75	62	73
		Avg. GRT	152	152	152	152	154	152	162	162	162	160	158	140	124	89	112
		No. permits	15	15	11	11	8	7	6	6	6	6	7	5	7	7	6
	General Category	Avg. Length	67	.	.	42	62	62	39	46	39	62	.	73	73	45	45
		Avg. GRT	97	.	.	17	61	61	25	44	25	61	.	114	116	25	25
		No. permits	1	.	.	1	1	1	3	4	3	1	.	3	4	1	1
Lowland, NC	Limited access	Avg. Length	73	73	73	73	73	74	73	73	73	72	75	77	78	81	81
		Avg. GRT	92	92	97	92	92	107	106	106	106	102	103	112	114	118	118
		No. permits	6	6	7	6	6	8	7	7	7	8	9	8	8	7	7
	General Category	Avg. Length	68	66	66	66	66	66	66	66	66	62	73	70	69	78	82
		Avg. GRT	75	73	73	73	73	73	73	73	73	73	103	99	92	95	105
		No. permits	7	2	2	2	2	2	2	2	2	2	5	7	7	2	5
New Bedford, MA	Limited access	Avg. Length	87	88	87	87	87	87	86	85	84	84	85	82	82	84	84
		Avg. GRT	172	173	174	174	176	175	173	169	164	163	164	153	154	158	160
		No. permits	94	91	79	75	73	78	81	96	105	110	115	130	136	137	136
	General	Avg. Length	66	66	67	69	68	68	66	66	66	65	64	61	61	78	75

Port	Permit type	Variable	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Category	Avg. GRT	101	102	103	110	109	107	103	101	103	102	98	94	96	140	133
		No. permits	160	156	146	146	118	113	117	123	123	124	128	130	128	67	72
New Bern, NC	Limited access	Avg. Length	84	73	71	73	73	75	77	75	77	79	79	83	76	81	81
		Avg. GRT	198	89	89	94	94	103	115	106	114	113	113	122	114	122	121
		No. permits	1	2	2	4	4	6	6	8	8	8	8	13	13	11	11
	General Category	Avg. Length	75	.	75	.	67	.	.	67	.	.	43	69	60	79	70
		Avg. GRT	81	.	81	.	79	.	.	97	.	.	18	98	80	113	90
		No. permits	1	.	1	.	1	.	.	1	.	.	1	5	6	5	10
New London, CT	Limited access	Avg. Length	.	.	.	.	.	86	86	86	86	86	86	83	81	81	81
		Avg. GRT	.	.	.	.	.	147	147	147	147	147	147	188	168	168	168
		No. permits	.	.	.	.	.	1	1	1	1	1	1	3	5	5	5
	General Category	Avg. Length	73	73	61	53	49	50	51	54	52	56	53	54	54	50	50
		Avg. GRT	125	125	85	65	55	55	59	63	52	57	49	52	52	30	30
		No. permits	3	3	5	7	9	9	8	11	10	8	11	10	10	2	2
Newport News, VA	Limited access	Avg. Length	76	78	79	79	79	79	79	78	78	78	79	79	77	78	78
		Avg. GRT	131	138	143	148	149	149	148	146	146	145	142	143	140	141	141
		No. permits	8	9	10	10	12	17	19	21	21	21	22	23	19	18	18
	General Category	Avg. Length	.	.	52	50	69	64	64	.	63	63	52	56	67	55	55
		Avg. GRT	.	.	42	42	92	88	88	.	86	86	52	74	101	51	51
		No. permits	.	.	1	1	4	1	1	.	1	1	2	8	5	2	2
Norfolk, VA	Limited access	Avg. Length	77	79	79	78	79	79	78	79	80	80	81	79	80	80	80
		Avg. GRT	137	138	138	138	136	133	132	133	135	137	140	139	139	141	141
		No. permits	65	67	63	58	51	42	35	27	27	27	22	13	12	11	11
	General Category	Avg. Length	66	63	66	69	70	63	59	60	60	57	55	52	51	81	81
		Avg. GRT	85	75	84	92	92	77	76	74	72	62	57	48	46	129	129
		No. permits	41	35	26	30	21	20	14	18	20	18	17	16	14	3	3
Oriental, NC	Limited access	Avg. Length	71	71	70	73	76	75	76	75	66	68	79	80	67	72	79
		Avg. GRT	101	101	108	121	127	126	127	123	100	99	115	118	94	102	123
		No. permits	2	2	3	2	4	5	4	5	5	7	9	9	14	7	4
	General Category	Avg. Length	.	.	.	.	70	69	69	70	65	65	68	68	59	40	40
		Avg. GRT	.	.	.	.	109	105	105	109	88	88	92	88	74	23	23
		No. permits	.	.	.	.	2	3	3	2	4	4	10	9	15	1	1

Point Judith, RI	Limited access	Avg. Length	85	85	76	76	76	80	80	76	76	76	82	81	79	78	78
		Avg. GRT	175	175	149	149	149	161	161	149	149	149	166	164	157	151	151
		No. permits	1	1	3	3	3	4	4	3	3	3	2	3	4	3	3
	General Category	Avg. Length	59	58	60	58	59	57	57	56	57	56	56	56	55	46	62
		Avg. GRT	73	74	78	73	74	71	70	67	70	70	67	68	67	31	91
		No. permits	71	76	72	82	78	81	76	79	80	84	87	90	93	5	8
Point Pleasant, NJ	Limited access	Avg. Length	75	75	79	79	83	83	83	82	82	82	82	82	82	71	76
		Avg. GRT	108	108	120	120	131	131	131	122	122	122	122	122	122	94	106
		No. permits	6	6	5	5	4	4	4	4	4	4	4	4	4	6	5
	General Category	Avg. Length	49	52	52	55	53	50	48	49	48	51	53	56	56	64	66
		Avg. GRT	48	53	53	60	59	47	43	45	44	48	51	56	56	78	79
		No. permits	24	20	20	21	25	27	29	33	34	31	35	37	41	14	15
Seaford, VA	Limited access	Avg. Length	86	86	82	.	.	.	.	83	87	84	84	86	87	87	87
		Avg. GRT	125	125	181	.	.	.	.	141	154	147	147	143	142	145	148
		No. permits	1	1	1	.	.	.	.	2	3	4	4	5	6	5	6
	General Category	Avg. Length	42	42	.	.	.	.	.	88	.	.	.	50	50	.	.
		Avg. GRT	6	6	.	.	.	.	.	135	.	.	.	48	48	.	.
		No. permits	1	1	.	.	.	.	.	1	.	.	.	1	1	.	.
Wanchese, NC	Limited access	Avg. Length	102	108	123	123	85	80	78	79	78	80	81	81	81	81	81
		Avg. GRT	150	148	143	143	164	129	136	143	145	151	152	152	151	151	151
		No. permits	4	3	2	2	2	1	4	8	7	7	6	6	8	8	8
	General Category	Avg. Length	76	76	75	70	74	68	65	63	59	57	54	54	54	66	73
		Avg. GRT	122	122	129	107	122	99	91	87	75	67	63	63	63	92	115
		No. permits	10	11	9	12	10	14	14	15	18	22	26	32	30	4	3

4.5 NON-TARGET SPECIES

Non-target species (or 'bycatch') include species caught by scallop gear that are not landed, including small scallops. The impacts of the scallop fishery on bycatch have been minimized to the extent practicable. Amendment 10 analyzed the impacts of new management measures (ring size, larger twine top, open area DAS, etc.) on bycatch, relying mainly on recent gear surveys and the general relationship between total area swept and bycatch. In general, the larger twine top mesh allowed greater escapement of many but not all finfish species with minor losses of sea scallop catch (particularly in areas having larger scallops). The effects of the increase to a 4" minimum ring size were assessed for various species observed in field trials, but the major effect came from a greater efficiency in catching scallops over 110-120 mm. Efficiency was forecast to increase by about 10-15%, reducing area swept by the same amount. Since most species were caught incidentally less frequently in dredges with larger rings and efficiency improved in most areas, Amendment 10 estimated that bycatch would decline, particularly in areas having most scallops larger than 110-120 mm. The increase to a minimum 4" ring in all areas occurred in December 2004. Amendment 10 also estimated that the reductions in open area DAS would reduce total area swept and increase scallop LPUE, particularly for larger scallops in the long-term. Appendix IX of Amendment 10 details scallop and finfish bycatch estimates in the scallop fishery (http://www.nefmc.org/scallops/index.html).

Framework 16/39 estimated the total bycatch of many finfish species from observed trips taken in controlled access areas. It also estimated the amount of sampling needed in each area to estimate the total bycatch of a given species with various levels of precision. In general, rotational area management is designed to improve and maintain high scallop yield, while minimizing impacts on groundfish mortality and other finfish catches. Access programs may even reduce fishing mortality for some finfish species, because the total amount of fishing time in access areas is very low compared with fishing time in open areas due to differences in LPUE. See Sections 6.1.1.2 and 6.1.1.3 of Framework 16/39 for more information about the expected impacts on bycatch from that action. Catches of regulated species in the access areas were expected to be less than 10% of the overall TAC in the Multispecies FMP. This amount is less than the level that the Groundfish PDT identified as having possible repercussions for meeting the groundfish mortality targets and affecting the rebuilding of overfished groundfish stocks.

4.5.1 Species caught incidentally in the scallop fishery

To identify potential non-target species caught incidentally in the scallop fishery, the Scallop PDT considered discard info from the 2008 SBRM report, Wigley et al. 2008, and various assessments such as GARM III and the Skates Data-poor Workshop (Table 53). A note of caution in using the 2008 SBRM data was that it was not extrapolated out to the entire fishery. Therefore, fisheries with higher observer coverage, such as the scallop fishery, appeared to have more bycatch than other fisheries.

Based on the 2008 SBRM report in which 2007-2008 data was compiled, the species with more than 5% of total estimated catch from discards in the scallop fishery are: fluke, winter flounder, monkfish, barndoor skate, little skate, unidentified skate, surfclams, and ocean quahog. These species were narrowed down by looking at the report presented by Wigley et al. (2008). While it is based on 2005 data, it is extrapolated out across fisheries such that a consistent conclusion can be made. Based on this report, the PDT identified the following species as having more than 5% of total estimated catch from discards in the scallop fishery: monkfish, skate (overall), and windowpane flounder (Table 53).

In addition to the snapshot of information available from the 2008 SBRM process and Wigley et al. (2008), the PDT also reviewed discard info for the scallop fishery in recent assessments for the species listed above. GARM III for multispecies identified that the scallop fishery caught more than 5% of the bycatch (compared to overall catch) for some species by region (Table 54). Georges Bank (GB) and Southern New England (SNE) yellowtail flounder were caught in amounts greater than 5%, but Cape Cod yellowtail only has occasional spikes over 5%. GB winter flounder has catch over 5%, but neither SNE nor Gulf of Maine (GOM) winter flounder is caught appreciably. Although there is greater than 5% caught in both the GB/GOM and SNE regions for windowpane flounder, the catch is generally higher in SNE. The Skate Data-poor Working Group identified the greatest bycatch for the scallop fishery as little and winter skates. Lastly, when extrapolated out across the entire fishery, the ocean quahog and surfclam assessments show close to zero bycatch of these species by the scallop fishery.

Table 53 – Summary of discards by species in scallop gear types (Based on 2005 observer data presented in Wigley et al. 2008). All values in live mt.

Species	Fishery Landings + discards	Scallop Fishery Total	Scallop Overall Percent	
Bluefish	3,058	0	0	
Atlantic Herring	100,071	0.05	0.0	
Atlantic Salmon	0	0		
Deep Sea Red Crab	2,117	0.14	0.0	*
Atl. Sea Scallop	219,901	5767.33	2.6	
Atl. Mackerel	43,780	1.42	0.0	
Illex Squid	13,623	1.61	0.0	**
Loligo Squid	17,890	3.48	0.0	**
Butterfish	1,422	0.14	0.0	
Monkfish	23,154	2563.1	11.1	
Atl. Cod	7,182	2.63	0.0	
Haddock	8,121	3.54	0.0	
Yellowtail Flounder	4,803	229.07	4.8	
American Plaice	1,652	8.35	0.5	
Witch Flounder	2,940	48.63	1.7	
Winter Flounder	4,026	118	2.9	
Pollock	6,580	0.03	0.0	
Acadian Redfish	648	0.32	0.0	
White Hake	2,809	5.43	0.2	**
Windowpane Flounder	935	164.81	17.6	
Atl. Halibut	31	0.01	0.0	
Ocean Pout	161	4.44	2.8	
Silver Hake	10,257	17.34	0.2	
Offshore Hake	24	0	0	**
Red Hake	1,959	61.72	3.2	**

Skates	50,168	10697.41	21.3	
Spiny Dogfish	5,489	47.07	0.9	
Summer Flounder	9,005	381.53	4.2	
Scup	4,815	1.47	0.0	
Black Sea Bass	1,395	4.76	0.3	
Atlantic Surfclam	140,886	13.55	0.0	*
Ocean Quahog	113,857	57.48	0.1	*
Tilefish	706	0	0	

** These species have gear-specific, directed fisheries that were not observed in 2005*

*** Potential "mixed" species: squid unknown, and red, offshore, and white hake mix.*

Shaded – greater than 5% of total bycatch comes from scallop fishery

Table 54 – Summary of discards by species in scallop gear types (Based GARM III analyses, except for skates). All values in live mt.

Species	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
GB Yellowtail flounder	9.6	14.1	23.6	16.4	0.8	1.1	8.0	1.3	5.2	15.9	7.7
SNE Yellowtail flounder	17.0	11.8	9.9	9.4	1.5	2.3	10.6	3.1	18.5	19.2	23.0
CC/GOM Yellowtail flounder	21.0	14.1	1.9	1.0	3.7	0.6	1.2	1.4	0.4	0.6	5.4
GB Winter flounder	4.8	3.5	3.7	2.6	0.4	0.7	0.1	0.2	4.0	6.9	13.2
GB/GOM Windowpane flounder	19.5	10.5	5.6	6.0	9.9	12.7	3.0	2.2	1.8	11.1	9.4
SNE Windowpane flounder	44.4	28.4	23.6	9.9	3.9	18.2	15.8	10.5	32.8	15.6	17.9
Skate Complex*	41.3	19.0	35.3	20.4	13.7	26.3	23.1	15.2	17.8	20.4	20.5

** Data is from the Skate Data-poor Workshop*

4.5.2 Groundfish Mortality Closed Areas and Yellowtail Flounder

The groundfish closed areas were originally established to reduce the effects of fishing on spawning cod and haddock, particularly within Closed Areas I and II. Peak spawning activity occurs from February to April, coinciding with the original seasonal closures. After spawning, these fish often disperse to other areas. Yellowtail flounder is another species that was intended to be protected by the groundfish closed areas. The Georges Bank stock is predominately found on the southeastern and northwestern portions of Georges Bank, overlapping the scallop access areas in Closed Areas I and II. Unlike spawning cod and haddock, however, yellowtail flounder tend to be present in these locations year around. The Southern New England stock of yellowtail flounder was one of the primary intended beneficiaries of the Nantucket Lightship Area. Most of this stock occurs in the portions of the Nantucket Lightship Area that will remain closed to scallop fishing, or in other areas of Southern New England and the Mid-Atlantic region where scallop fishing occurs in open areas. More details about the biological characteristics of groundfish species in the closed areas is provided in the FEIS for Amendment 13 to the Multispecies FMP.

Amendment 16 to the Multispecies FMP was recently approved by the Council and is currently under review by NMFS; it is expected to be implemented before May 1, 2010. Amendment 16 identified a process for setting annual catch limits (ACLs) for all Groundfish species. A major sub-component of yellowtail flounder catch is incidental catch in the scallop fishery, most of which is discarded. Amendment 16 calls for this catch to be estimated and identified as an "other sub-component" in 2010 until accountability measures (AMs) are adopted through the scallop FMP under this action in 2011, at which point the sub-component will be considered a sub-ACL.

Framework 44 to the GF plan considered this allocation and the proposed action allocates 100% of the projected GB and SNE/MA YT flounder ACL needed for the scallop fishery for FY2010 and 90% of what is needed for 2011 and 2012. These values recognize the importance of yellowtail flounder to the scallop fishery and provide an incentive for scallop fishermen to reduce their YT bycatch in order to maximize scallop yield. The values for 2011 and 2012 can be adjusted if there is new information regarding scallop and yellowtail stocks, or based on access area measures in the scallop fishery for those years. The Council decided not to have a separate allocation for the CC/GOM YT stock for the scallop fishery because estimated levels of catch from that stock are relatively low. This may be changed in the future if it is deemed necessary to include CC/GOM YT as part of the sub-ACL.

The Council approved FW44 at the November 2009 Council meeting, and it will be effective in 2010. The decision to allocate these amounts was based on an analysis of estimated incidental catch of YT in the scallop fishery and the associated impacts of various allocation alternatives on revenue in both the scallop and groundfish fisheries. Multispecies Framework 44 includes all the analyses related to this decision. Framework 44 also requires that all limited access vessels be required to land all legal-sized yellowtail flounder.

The Scallop and GF PDTs estimated the incidental catch of yellowtail flounder in the scallop fishery in 2010-2012 for Council action on MS Framework 44. At the September 2009 Council meeting staff presented the amount of YT needed to harvest scallop yield based on the ratio of yellowtail discards to scallop kept catches for the four scallop rotational management alternatives in this action, which will set measures for FY2010 only. More information on the allocations for the coming fishing years is given in Section 4.5.2 of Scallop Framework 21.

The AM adopted by the Council in Amendment 15 includes a seasonal closure of a portion of the YT stock area pre-identified as having high bycatch, with the LAGC fishery exempted. Section 3.2.3.11.2 of Amendment 15 describes in detail the alternative that was selected. In general, pre-defined areas will close on March 1 in the subsequent year until a time determined by the PDT to account for the overage.

4.5.3 Observer set-aside program

The scallop fishery is the only fishery in the Northeast that already has a resource or industry-funded observer program in place. Since 1999, the majority of observer coverage in the scallop fishery has been funded through the scallop observer set-aside program. A percentage of the total allowable catch (TAC) in access areas has been deducted before allocations are made to generate funding for vessels required to carry an observer. Amendment 10 extended that requirement to open areas as well, so a percent of potential allocated effort in DAS from open areas is set-aside to help fund the program. Observer coverage is necessary in the scallop fishery to monitor bycatch of finfish and to monitor interactions with endangered and threatened species. Vessels required to carry an observer are authorized to land more than the possession limit from trips in access areas, and in open areas vessels are charged a reduced amount to help compensate for the cost of an observer.

In 2008 and 2009, a total of 675 trips and 461 trips were observed on both limited access and general category vessels from the observer set-aside program (Table 55, 2010 numbers are through 1/06/11). This is equivalent to roughly 3700 sea days in 2008 and 3200 sea days in 2009 observed through this program. An additional 96 (in 2008) and 66 (in 2009) sea days were observed and paid for fully with federal funds. Preliminary data from 2010 suggests similar values for the most recent fishing year which has not yet been completed.

Table 55 – Summary of observed trips in the scallop fishery from observer set-aside program

	2008		**2009**		**2010* (as of 1/06/11)**	
	Trips	**DAS**	**Trips**	**DAS**	**Trips**	**DAS**
Elephant Trunk	*4 trips allocated*		*3 trips allocated*		*2 trips allocated*	
Limited Access	213	1752	113	1007	49	497
General Category	150	246	116	268	0	0
Delmarva	*Closed*		*1 trip allocated*		*1 trip allocated*	
Limited Access	Closed		37	299	36	300
General Category	Closed		37	82	19	33
Closed Area II	*Closed*		*1 trip*		*Closed*	
Limited Access	Closed		23	199	NA	NA
General Category	Closed		NA		NA	
Nantucket Lightship	*1 trip allocated*		*Closed*		*1 trip allocated*	
Limited Access	34	244	Closed		31	221
General Category	106	193	Closed		Closed	
Open Areas	*35 DAS allocated*		*37 DAS allocated*		*29 DAS allocated*	
Limited Access	126	1195	135	1359	119	1200
General Category	N/A – not part of set-aside program		N/A – not part of set-aside program		N/A – not part of set-aside program	
TOTAL	***675***	***3726***	***461***	***3214***	***223***	***2030***
Limited Access	**373**	**3191**	**308**	**2864**	**204**	**1997**
General Category	**256**	**436**	**153**	**350**	**19**	**33**
Additional non-RSA federally funded days (GC Open Area)	46	96	41	66	84	124

**2010 data is incomplete and considered preliminary*

4.6 OTHER FISHERIES

4.6.1 Other fisheries scallop vessels are involved in

The scallop fishery is year round and extends from Maine to North Carolina. Therefore, the potential impacts on other fisheries depend on where vessels are generally homeported, and the amount of time their vessel has to engage in other fisheries. In recent years scallop vessels have reduced the amount of time they are targeting scallops. Days fished have been dramatically reduced since limited entry was adopted with a DAS system in 1994. Furthermore, since area rotation was formally established in 2004, DAS-used have reduced even further (See Table 56).

Table 56. Vessel size, DAS-used and LPUE by years fished by full-time limited access vessels

FISHYEAR	Years Fished	Number of vessels	Average GRT	Average HP	Average DAS-used	Average LPUE
1994	Less than 14 Years	86	143	727	135	591
	14 years	124	168	899	180	519
1994 Total		210	158	829	161	543
1999	Less than 14 Years	92	141	706	88	917
	14 years	124	168	905	109	994
1999 Total		216	157	820	100	963
2003	Less than 14 Years	155	136	678	105	1,588
	14 years	124	167	905	117	1,867
2003 Total		279	150	779	110	1,713
2004	Less than 14 Years	171	135	690	95	1,941
	14 years	124	167	904	97	2,371
2004 Total		295	149	780	96	2,124
2005	Less than 14 Years	188	133	702	77	1,775
	14 years	124	166	907	83	2,004
2005 Total		312	146	783	79	1,866
2006	Less than 14 Years	190	133	709	78	1,804
	14 years	124	166	907	86	2,087
2006 Total		314	146	787	81	1,918
2007	Less than 14 Years	191	134	716	97	1,602
	14 years	124	166	907	93	1,884
2007 Total		315	147	791	95	1,714

**Excluding outliers and LPUE data <400 pound*

Table 57 lists the permits held in other fishery management plans (FMPs) by scallop limited access (LA) permit holders, and Table 58 gives those for the LAGC separated out by permit category. It is clear from these tables that the majority of LA and LAGC vessels have permits in several fisheries other than scallops including monkfish, multispecies, summer flounder and skates just to name a few. Not all of the LA and LAGC vessels with multiple fishery permits were active in those fisheries, however. For the full-time and part-time LA vessels, monkfish (242 FT, 28 PT vessels active in 2009) and summer flounder (68 FT, 22 PT vessels active in 2009) were the top fisheries with the highest rate of participation, followed by sea bass and squid fisheries which have considerably less participation especially by the FT vessels (Table 59 and Table 60). The same is true for LAGC vessels except that their activity is distributed in a wider range of fisheries including multispecies, lobster, squid, scup and small mesh fisheries (Table 61 and Table 62).

Table 57. Other Fishery Management Plan permits held FY 2009, by scallop limited access boats.

Plan	# held	%
BLUEFISH	317	91
BLACK SEA BASS	141	41
DOGFISH	333	96
SUMMER FLOUNDER	294	85
HERRING	284	82
LOBSTER	223	64
MULTISPECIES	331	95
MONKFISH	341	98
OCEAN QUAHOG	285	82
SCALLOP-LA	347	100
SCALLOP-LAGC	180	52
SCUP	133	38
SURF CLAM	282	81
SMB	326	94
RED CRAB	268	77
SKATE	310	89
TILEFISH	301	87

Table 58. Other Fishery Management Plan permits held FYI 2009, by scallop LAGC boats, separated by permit category.

	CAT A: IFQ		CAT B: NGOM		CAT C: Incidental	
Plan	**# held**	**%**	**# held**	**%**	**# held**	**%**
SCALLOP-LAGC	284	100	113	100	278	100
BLUEFISH	254	89	103	91	245	88
BLK S. BASS	100	35	26	23	138	50
DOGFISH	254	89	107	95	262	94
SMR FLOUNDER	162	57	45	40	207	74
HERRING	225	79	106	94	237	85
LOBSTER	166	58	89	79	199	72
MULTISPECIES	241	85	106	94	255	92
MONKFISH	269	95	106	94	265	95
OCEAN QUAHOG	182	64	59	52	215	77
SCALLOP-LA	40	14	27	24	113	41
SCUP	109	38	32	28	146	53
SURF CLAM	178	63	61	54	217	78
SMB	244	86	100	88	252	91
RED CRAB	196	69	79	70	219	79
SKATE	256	90	100	88	249	90
TILEFISH	220	77	85	75	245	88

Table 59. Number of Full-time vessels with landings of corresponding species (includes fisheries with 5 or more vessels participating)

Species	2005	2006	2007	2008	2009	2010*
MONKFISH (ANGLER)	251	257	277	277	242	204
BLUEFISH	25	24	20	21	18	8
BUTTERFISH	5	6	12	13	13	3
COD	13	14	6	8	7	6
CROAKER, ATLANTIC	8	6	6	14	9	4
FLOUNDER, AM. PLAICE	14	10	5	6	8	6
FLOUNDER, SUMMER	79	86	82	66	68	56
FLOUNDER, WINTER	24	29	37	22	14	9
FLOUNDER, WITCH	17	17	12	11	15	6
FLOUNDER, YELLOWTAIL	18	15	14	10	17	48
HADDOCK	13	10	6	7	6	6
LOBSTER	21	12	12	11	11	11
SCALLOP, SEA	304	312	316	308	308	301
SCUP	18	17	16	20	16	23
SEA BASS, BLACK	28	26	24	26	24	16
SKATES(HEADS)	12	8	5	7	6	6
SQUID (LOLIGO)	31	31	19	27	22	10
WEAKFISH, SQUETEAGUE	12	13	16	12	7	5

*2010 numbers are preliminary

Table 60. Number of Part-time and occasional vessels with landings of corresponding species (includes fisheries with 5 or more vessels participating)

Species	2005	2006	2007	2008	2009	2010*
ANGLER	28	35	29	28	28	24
BLUEFISH	11	17	11	11	15	3
BUTTERFISH	7	8	9	8	6	2
CROAKER, ATLANTIC	6	8	8	5	6	2
FLOUNDER, SUMMER	24	27	25	20	22	21
MACKEREL, ATLANTIC	6	7	7	5	6	7
SCALLOP, SEA	32	36	34	32	34	34
SCUP	12	15	14	8	13	15
SEA BASS, BLACK	19	19	20	17	15	16
SQUID (LOLIGO)	17	20	19	15	15	5
WEAKFISH, SQUETEAGUE	7	11	9	8	7	4

*2010 numbers are preliminary

Table 61. Number of LAGC-IFQ vessels with landings of corresponding species (includes fisheries with 10 or more vessels participating in 2008)

Species	2008	2009	2010*
SCALLOP, SEA	229	247	168
MONKFISH	210	222	167
FLOUNDER, SUMMER	122	120	110
FLOUNDER, WINTER	92	74	59
LOBSTER	88	75	61
COD	84	74	70
FLOUNDER, YELLOWTAIL	80	76	70
SKATES(HEADS)	80	76	59
FLOUNDER, WITCH	79	66	61
HADDOCK	70	62	53
FLOUNDER, AM. PLAICE	69	66	52
BLUEFISH	66	81	51
POLLOCK	63	56	46
SEA BASS, BLACK	61	55	55
SQUID (LOLIGO)	59	64	45
HAKE, WHITE	57	51	45
FLOUNDER, SAND-DAB	52	43	7
HAKE, SILVER	52	54	41
WOLFFISHES	50	38	15
SCUP	44	48	56
HALIBUT, ATLANTIC	41	38	23
BUTTERFISH	40	58	36
REDFISH	39	43	35
WEAKFISH, SQUETEAGUE	37	42	20
CUSK	35	33	27
DOGFISH SPINY	33	59	28
SKATE, WINTER(BIG)	33	44	34
BASS, STRIPED	27	15	10
CROAKER, ATLANTIC	26	35	13
HAKE, RED	26	28	23
DOGFISH SMOOTH	25	38	27
MACKEREL, ATLANTIC	22	33	19
EEL, CONGER	17	15	13
WHITING, KING	15	25	5
SEA ROBINS	14	17	10
TAUTOG	14	9	9
HERRING, ATLANTIC	13	12	15
JOHN DORY	12	8	7
WHELK, CHANNELED	12	14	12
TILEFISH, GOLDEN	11	10	15

Table 62. Number of LAGC-NGOM vessels with landings of corresponding species (includes fisheries with 10 or more vessels participating in 2009)

Species	2008	2009	2010*
ANGLER	69	80	66
COD	51	65	54
FLOUNDER, AM. PLAICE	46	57	48
FLOUNDER, WITCH	48	56	44
HADDOCK	49	54	44
POLLOCK	47	54	43
HAKE, WHITE	43	50	41
FLOUNDER, WINTER	38	48	38
FLOUNDER, YELLOWTAIL	37	48	49
LOBSTER	49	47	29
REDFISH	42	46	37
WOLFFISHES	45	46	19
SCALLOP, SEA	23	37	33
HAKE, SILVER	24	36	29
CUSK	33	35	26
DOGFISH SPINY	24	34	26
SKATES(HEADS)	22	31	29
BLUEFISH	13	26	14
HALIBUT, ATLANTIC	19	25	21
SHRIMP (PANDALID)	14	23	12
FLOUNDER, SUMMER	6	21	14
MACKEREL, ATLANTIC	11	18	3
SEA BASS, BLACK	5	17	10
SQUID (LOLIGO)	8	16	9
FLOUNDER, SAND-DAB	11	15	2
SCUP	5	13	12
BUTTERFISH	5	11	7

Table 63 includes revenues from other fisheries for the full-time vessels which totaled more than $400,000 in any given year, and for the part-time vessels it includes revenues which totaled more than $100,000 in any given year. Yellowtail and monkfish revenues included even when they were small compared to revenues from other fisheries. This table indicates that revenues from other fisheries constituted less than 1% of the total revenue by the full-time fleet. For the part-time fleet, however, other important sources of revenue were summer flounder (7% to 15% of total in 2005-2009), shrimp, menhaden, and squid in 2009 fishing year.

Table 64 shows the percentage of revenue earned from each of these other fisheries by the limited access full-time and part-time vessels. The share of full-time scallop vessels in total monkfish, summer flounder and squid fishery revenues were 4% or more during 2005-2008. Part-time fleet had a share of 3% or more in summer flounder, scup and sea bass fisheries during the same time period.

Table 63. Composition of Revenue for the Limited Access vessels

Permit type	All Species		2005	2006	2007	2008	2009	2010 (YTD)
FULL-TIME	**Sea Scallops**	Value	345,708,369	307,792,971	343,366,447	316,497,595	322,467,793	132,170,210
		% of total	97.4%	97.5%	97.2%	97.2%	97.9%	98.1%
	Monkfish	Value	2,240,078	2,038,301	3,714,976	2,481,260	1,677,261	406,821
		% of total	0.6%	0.6%	1.1%	0.8%	0.5%	0.3%
	Yellowtail	Value	148,212	6,331	47,066	51,131	52,995	30,529
		% of total	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Summer flounder	Value	1,791,436	1,966,539	996,734	1,352,661	1,185,205	460,046
		% of total	0.5%	0.6%	0.3%	0.4%	0.4%	0.3%
	Squid (Loligo)	Value	1,339,105	1,472,007	1,726,287	1,432,213	1,053,330	180,390
		% of total	0.4%	0.5%	0.5%	0.4%	0.3%	0.1%
	Sea Bass (black)	Value	418,366	229,858	314,969	350,186	351,128	261,610
		% of total	0.1%	0.1%	0.1%	0.1%	0.1%	0.2%
	Haddock	Value	406,924	272,657	358,516	599,053	444,602	459,932
		% of total	0.1%	0.1%	0.1%	0.2%	0.1%	0.3%
	Lobster	Value	276,225	300,267	268,212	264,685	497,084	108,050
		% of total	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%
PART-TIME	**Sea Scallops**	Value	14,335,969	10,072,123	12,128,286	10,954,792	10,181,736	6,333,480
		% of total	82%	71%	77%	84%	78%	89%
	Summer Flounder	Value	1,588,704	2,202,178	1,226,856	756,502	977,016	408,203
		% of total	9%	15%	8%	6%	7%	6%
	Shrimp (Brown)	Value	1,453	155,256	63,547	.	449,583	.
		% of total	0%	1%	0%	0%	3%	0%
	Menhaden	Value	.	96,334	74,615	107,390	444,117	.
		% of total	0%	1%	0%	1%	3%	0%
	Squid (Loligo)	Value	604,024	370,924	421,506	279,880	230,273	28,794
		% of total	3%	3%	3%	2%	2%	0%
	Squid (Illex)	Value	48,438	19,916	67,855	311,729	239,886	.
		% of total	0%	0%	0%	2%	2%	0%
	Other Shellfish	Value	.	188,639	852,908	.	114,221	.
		% of total	0%	1%	5%	0%	1%	0%
	Monkfish	Value	71,056	94,976	96,534	79,557	47,495	17,903
		% of total	0%	1%	1%	1%	0%	0%
	Yellowtail	Value	14,415	732	152,142	256	79	97
		% of total	0%	0%	1%	0%	0%	0%

Table 64. Revenue from other fisheries by limited access vessels as a percentage of total revenue from that fishery

Other fisheries	Permit		2005	2006	2007	2008
Monkfish	Total fishery revenue	Value	42,252,278	33,458,992	28,819,653	24,563,651
	Full-time	% of total	5%	6%	13%	10%
	Part-time	% of total	0.2%	0.3%	0.3%	0.3%
Yellowtail Flounder	Total fishery revenue	Value	10,631,665	7,105,935	7,216,080	5,437,264
	Full-time	% of total	1%	0%	1%	1%
	Part-time	% of total	0.1%	0.0%	2.1%	0.0%
Summer Flounder	Total fishery revenue	Value	30,118,259	28,643,391	24,125,601	22,164,328
	Full-time	% of total	6%	7%	4%	6%
	Part-time	% of total	5%	8%	5%	3%
Shrimp (Brown)	Total fishery revenue	Value	156,025,654	181,510,196	180,710,196	155,114,005
	Full-time	% of total	NA	NA	NA	NA
	Part-time	% of total	0.0%	0.1%	0.0%	0.0%
Menhaden	Total fishery revenue	Value	62,519,721	69,682,661	93,098,638	88,766,700
	Full-time	% of total	0.0%	0.0%	0.0%	0.0%
	Part-time	% of total	0.0%	0.0%	0.0%	0.0%
Squid (Loligo)	Total fishery revenue	Value	28,766,828	27,703,213	9,810,398	6,907,218
	Full-time	% of total	5%	5%	18%	21%
	Part-time	% of total	2%	1%	4%	4%
Scup	Total fishery revenue	Value	7,351,491	8,221,718	9,997,474	6,162,392
	Full-time	% of total	2%	1%	2%	6%
	Part-time	% of total	4%	3%	3%	2%
Sea Bass (Black)	Total fishery revenue	Value	7,929,257	8,807,189	7,542,616	5,920,736
	Full-time	% of total	5%	3%	4%	6%
	Part-time	% of total	2%	3%	3%	2%

Note: Total fishery value for each species is obtained from NMFS website, commercial fisheries at http://www.st.nmfs.noaa.gov/pls/webpls/FT_HELP.SPECIES. Latest year available was 2008.

5.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

5.1 SCALLOP RESOURCE

5.1.1 Acceptable Biological Catch

Acceptable Biological Catch (ABC) is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. The determination of ABC will consider scientific uncertainty, and the Council may not exceed the fishing level recommendations of its Science and Statistical Committee (SSC) in setting ACLs (Section 302(h)(6)). Under "No Action" for FY 2011 and FY 2012, the overall ABC with discards for each year would be identical to that of FY 2010 (29,578 mt; 65.2 mil lbs), resulting in an ABC for the fishery of 26,219 mt (57.8 m lbs), after accounting for discards (3,363 mt; 7.4 m lbs). This is slightly higher than the updated estimates of ABC adopted under the proposed action (Table 65). These values are set based on the best available science and take into account all sources of scientific uncertainty; therefore keeping harvest below these levels will help prevent overfishing and have positive impacts on the resource. Later in the process it was determined that setting specifications for a third year would be advantageous compared to having 2012 measure roll over if subsequent actions are implemented late. ABC for 2013 was calculated the same way and is equivalent to 28,700 mt, or 63,272,670 pounds, not including discards. Compared to the No Action ABC, these values are more beneficial for the scallop resource because they are based on more updated information and reduce the risk of overfishing.

Table 65 – Summary of ABC approved by the SSC and Council for FW22 (shaded). ABC available to fishery after discards removed in BOLD

Year	**Landings (ABC available to fishery after discards removed)**	Discards	Catch (ABC)	Exploitable Biomass
2011	**60,117,237**	8,838,241	68,957,683	161,982,985
2012	**63,847,421**	9,420,256	73,267,676	184,291,332

5.1.2 Summary of biological projections for overall allocation alternatives considered in this action for the limited access fishery

The biological impacts for the allocation alternatives considered in this action are based on results from an updated version of the SAMS (Scallop Area Management Simulator) model. This model has been used to project abundances and landings to aid management decisions since 1999. SAMS is a size-structured model that forecasts scallop populations in a number of areas. In this version of the model, Georges Bank was divided into the three access portions of the groundfish closures, the three no access portions of these areas, a proposed closure area in the South Channel, the remainder of the South Channel, the Northern Edge and Peak, and the Southeast Part of Georges Bank (Figure 34). The Mid-Atlantic was subdivided into six areas: Virginia Beach, Delmarva, the Elephant Trunk Access Area, the proposed new version of the

Hudson Canyon South Access Area, New York Bight South, and Long Island. For this framework these areas were then merged into the three YT stock boundaries because the Council needs to know the projected scallop catch by YT stock area for allocation decision related to YT bycatch TACs.

It is important to note that this model is based on fishing mortality by area and the inputs are not fishery-based in terms of DAS, etc. The simulation does not model individual vessels or trips; it models the fleet as a whole. The output of the model is then used to eventually compute individual DAS allocations after set-asides, general category landings, etc. are removed.

Several important modifications have been made to these projections compared to the ones used last year for 2010 (FW21). Primarily, the fleet dynamics model within the SAMS model has been adjusted. The fleet dynamics model predicts where effort is going to go into each of the sub-areas in the SAMS model. In the past, effort per area was proportional to exploitable biomass in that area. This works when exploitable biomass and LPUE are similar, which has been the case until very recently. In the last few years the PDT is seeing a divergence and areas with the highest exploitable biomass (like the Channel) are not the same areas with highest LPUE like the New York Bight. So the fleet dynamics model has been adjusted to direct effort into areas with highest LPUE rather than highest exploitable biomass which is expected to mirror how the fishery would react more accurately. Once this change is made fishing mortality is reduced because effort is highest in areas with highest LPUE and lower in areas with higher exploitable biomass, which has higher impacts on F because scallops are smaller and discard mortality is likely higher. For example, when more effort is moved to the SAMS area which includes the New York Bight the catch per unit of effort increases and fishing mortality is lower, so more DAS can be allocated for the same fishing mortality rate. In addition, the SAMS projections for this action include overall LPUE of around 2,200 pounds, compared to 1,700 pounds used in FW21. Those 500 pounds make a big difference in terms of total catch and fishing mortality.

The SAMS model provides projected exploitable biomass estimates, scallop landings, average LPUE, DAS used and bottom area swept by area. All of these projections are described in the following tables and figures. Projections are run out 14 years to provide long-term impacts as required by law. After year two, the model uses the same assumptions for allocations in 2013 and beyond. Therefore, the only difference between the overall performances of the alternatives is during the first 2 years. For this analysis F_{target} has been set at $F = 0.28$ in 2013 and beyond.

Table 66 is a summary of the options considered for 2011 and 2012. For 2013, the same allocations were considered for all alternatives: 35 open area DAS, 0.5 trips in Delmarva, 1.5 trips in Hudson Canyon, one trip in NL and 1 trip in CA2. The Scallop Committee and Council later decided to reduce open area DAS by 25% in 2013 to be precautionary (Section 2.6.2), but the projections used for the biological and economic analyses uses the original projections of effort for 2013 since that is closer to what ultimate allocations will be when these default measures are replaced in a subsequent framework action (Framework 24). Setting measures with additional precaution for the third year will help prevent overfishing if actions are implemented late and future allocations are lower than currently estimated for 2013. This measure would have beneficial impacts on the resource if future effort levels need to be reduced by holding effort at lower levels until updated information is available.

This action also includes a lottery system for the allocation of split trips. The Scallop Committee and Council identified this as the preferred strategy so vessels were treated equally. The administration of the lottery is not expected to have any direct impacts on the resource positive or negative since it is only related to how effort will be allocated. All trips are expected to be used since vessels will continue to have the flexibility to trade access area trips.

Overall, the biological projections suggest that Alternative 1, the proposed action performs the best in terms of the highest projected catch in both the short and long term (Section 5.1.2.2), the highest LPUE (Section 5.1.2.3), thus lowest area swept (Section 5.1.2.4). Total biomass is higher under No Action, but that is an artifact of the access area schedule under No Action which is not realistic (Section 5.1.2.1). Therefore, in terms of expected impacts on the resource overall, Alternative 1 is expected to have beneficial impacts compared to the No Action and the other alternatives considered.

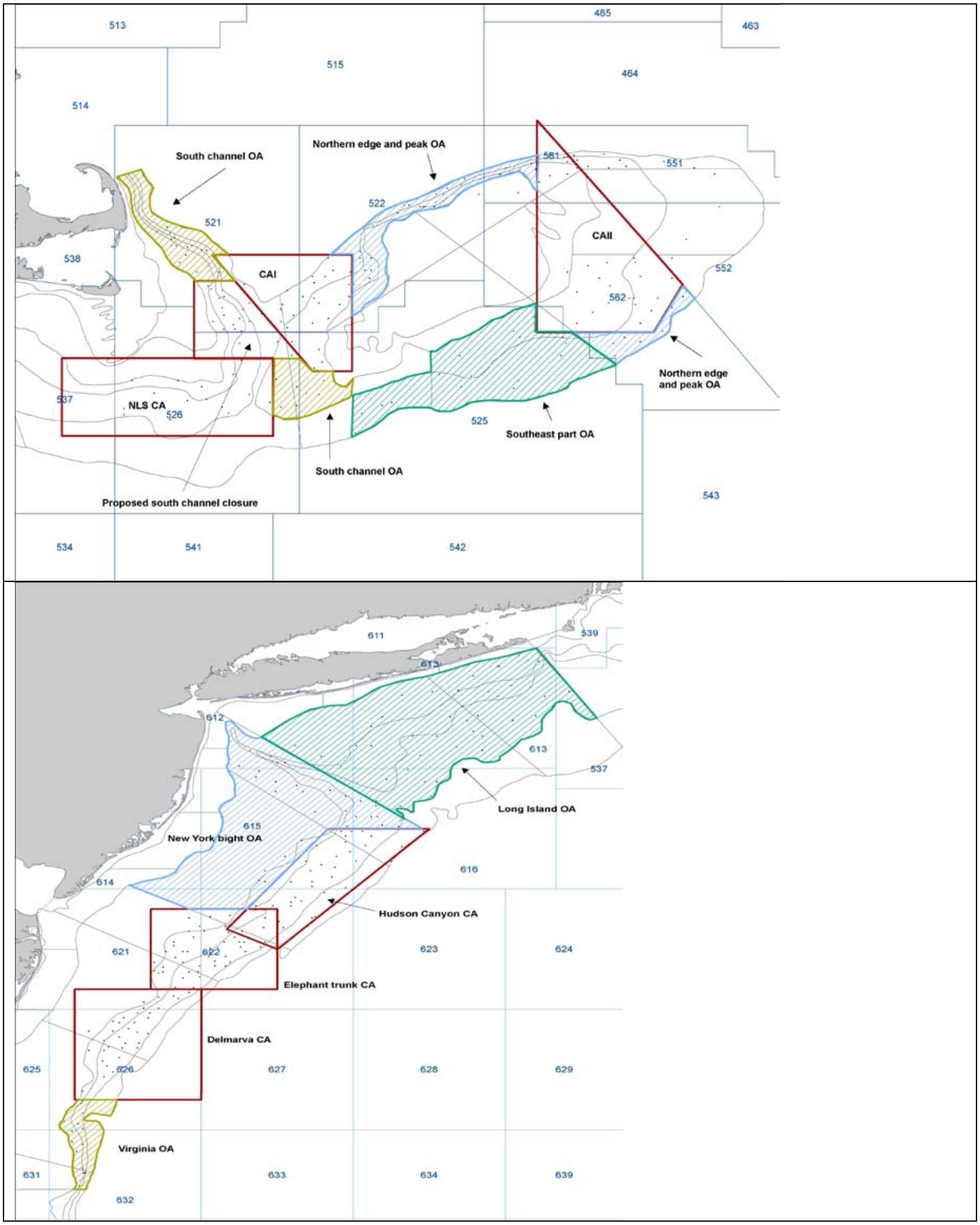
The No Action allocation alternative has negative impacts on the environment compared to the other alternatives because it has the lowest LPUE, and highest bottom area swept the first year. Thus fishing gear would be on the bottom longer under No Action compared to the other alternatives. Long term biomass is similar, even higher in some years, but landings are lower than all the other alternatives. Since Hudson Canyon remains closed, biomass remains high, but that yield is not converted into catch under No Action. In terms of impacts on fishing mortality, the No Action alternative has a slightly higher estimate of overall F compared to the other alternatives considered because of higher open area effort; thus negative impacts on the scallop resource. Optimum yield is not achieved under No Action fishery specifications because effort is not allocated in the most ideal areas based on the principles of area rotation.

Table 66 – Framework 22 alternatives under consideration

	CA1	CA2	NL	HC	Del	ET	Total	Channel	OA DAS
Alternative 1 (proposed action)									
2011	1.5	0.5	-	1	1	-	4	open	32
2012	0.5	1	0.5	1.5	0.5	-	4	open	34
Alternative 2									
2011	2	-	-	1	1	-	4	open	32
2012	-	1	1	1	1	-	4	open	34
Alternative 3 (Schcl)									
2011	2	1	-	1	1	-	5	closed	22
2012	-	1	0.5	1.5	0.5	-	6	Open (2.5)	23
No Action									
2011	-	-	1	-	1	2*	4	open	38
2012	-	-	-	-	1	2*	3*	open	38
SQ - 2010									
2011	1.5	0.5	-	1	1	-	4	open	38
2012	0.5	1	0.5	1.5	0.5	-	4	open	38

** Trips may be allocated to this area, but there is not sufficient biomass in this area to support that effort, so trips will not be complete and catch for the area will be substantially lower than 2 trips typically produce, closer to 5 million compared to 12 million pounds.*

Figure 34- SAMS model areas, with statistical areas and stratum boundaries on Georges Bank and the Mid-Atlantic



5.1.2.1 Projected biomass by area

- Total biomass is similar for all alternatives considered (Figure 35).
- Biomass is expected to increase modestly over the long term because of growth of scallops in the Channel.
- Long-term projections are about 160,000 mt.
- Over the course of this action (2011-2013) biomass is expected to increase moderately.
- Figure 36 shows that the mean biomass for the proposed action, Alternative 1, will increase slightly and is relatively certain. The confidence interval does get wider the further out the estimate is, after 2013, but that year is a default year and will be replaced with future specifications in a subsequent framework.
- Since effort is reduced in open areas under the hybrid overfishing definition (set at 0.38 in open areas) compared to recent years when open area F has been higher, over the long-term yield will be higher.

Figure 35 - Comparison of projected total scallop biomass for the alternatives under consideration

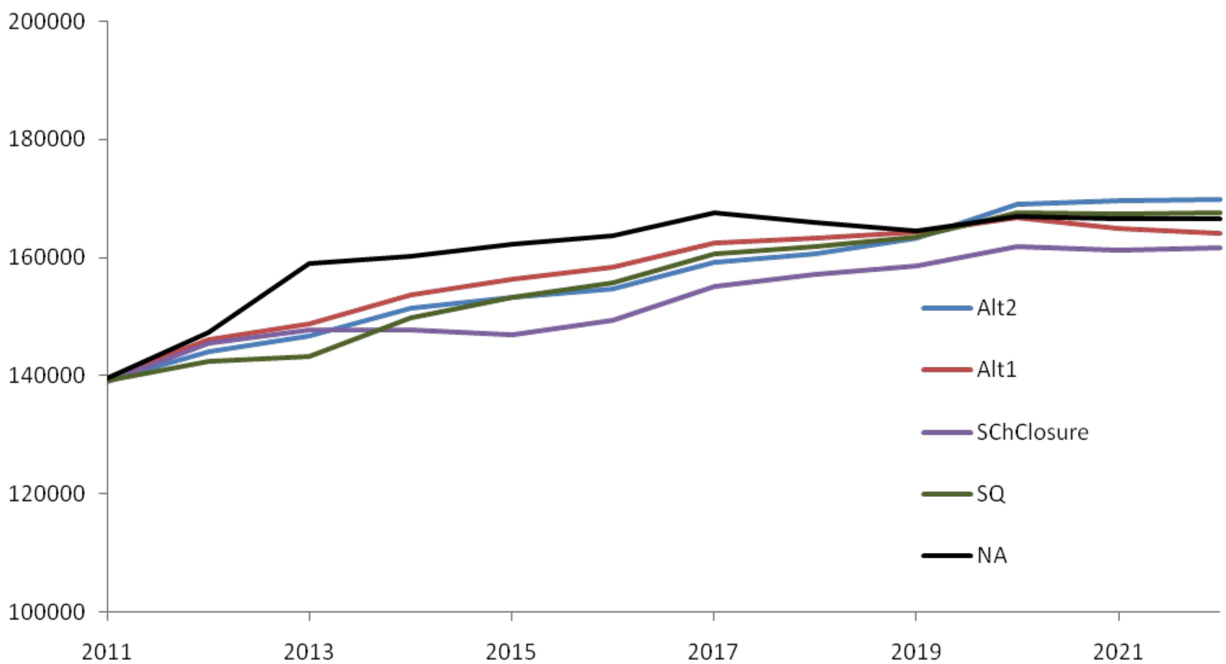
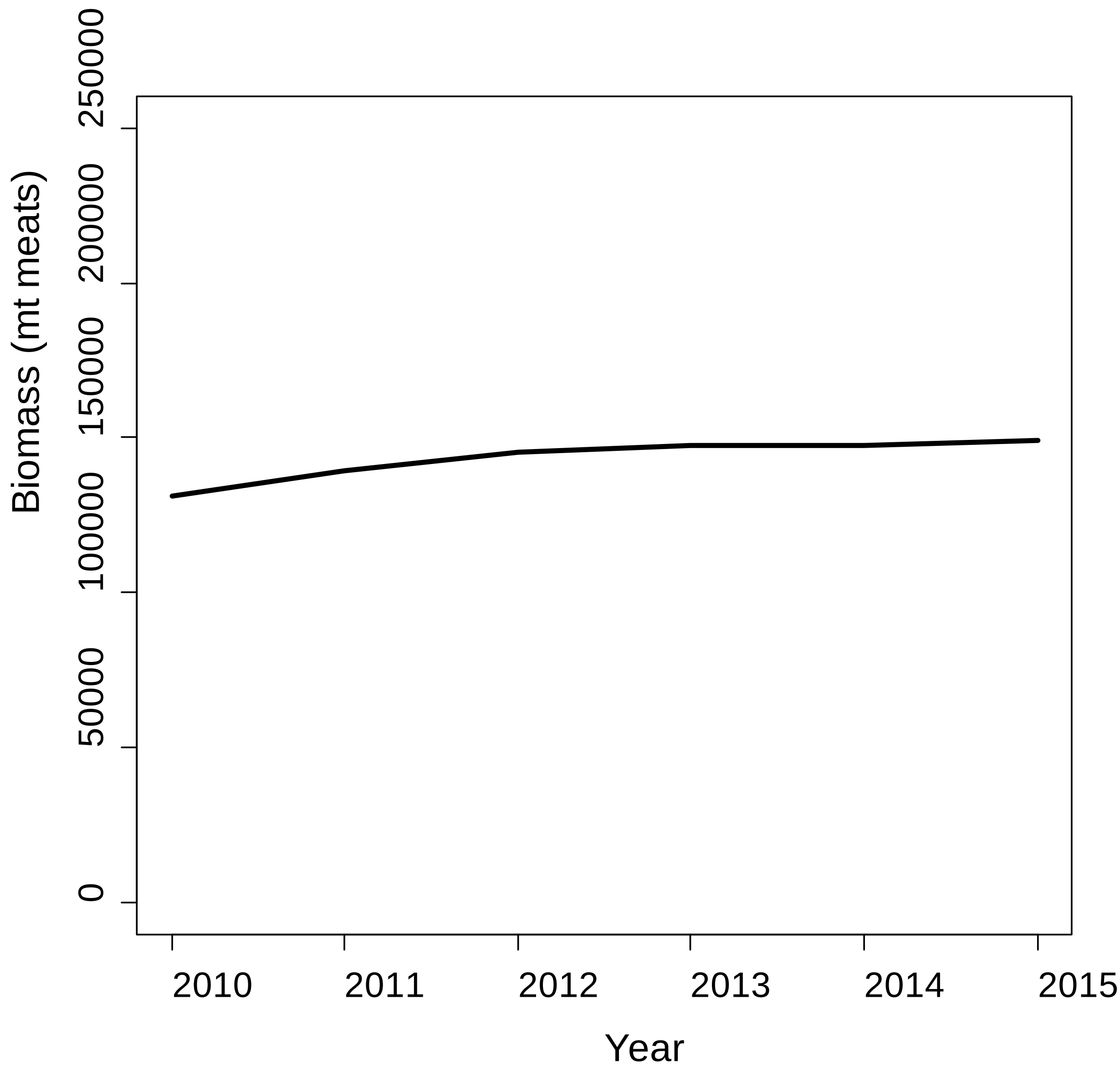


Figure 36 - Projected biomass for the final Alternative 1 (2011-2013 allocation) including indicators of uncertainty and the mean estimate



5.1.2.2 Projected scallop landings by area

- Landings are lowest for No Action because there is not sufficient biomass in ETA to support two trips.
- SQ alternative has higher projected catch because that option includes more open area DAS. For that alternative to give 38 DAS, open area *F* is about 0.46 for both years, compared to the other alternatives that restrict open area *F* at 0.38, the maximum for open area *F* under the hybrid overfishing definition.
- Alternatives 1 and 2 have more stable landings over time.
- Channel alternative (SChClosure) estimates more catch in 2013 and 2014, but lower landings long term.
- Figure 38 shows that the mean landings for the proposed action, Alternative 1, will increase slightly and is relatively certain. The confidence interval does get wider the further out the estimate is, after 2013, but that year is a default year and will be replaced with future specifications in a subsequent framework.
- Alternative 1, the proposed action gives the highest short and long term landings.

Figure 37 - Comparison of projected scallop landings for the alternatives under consideration

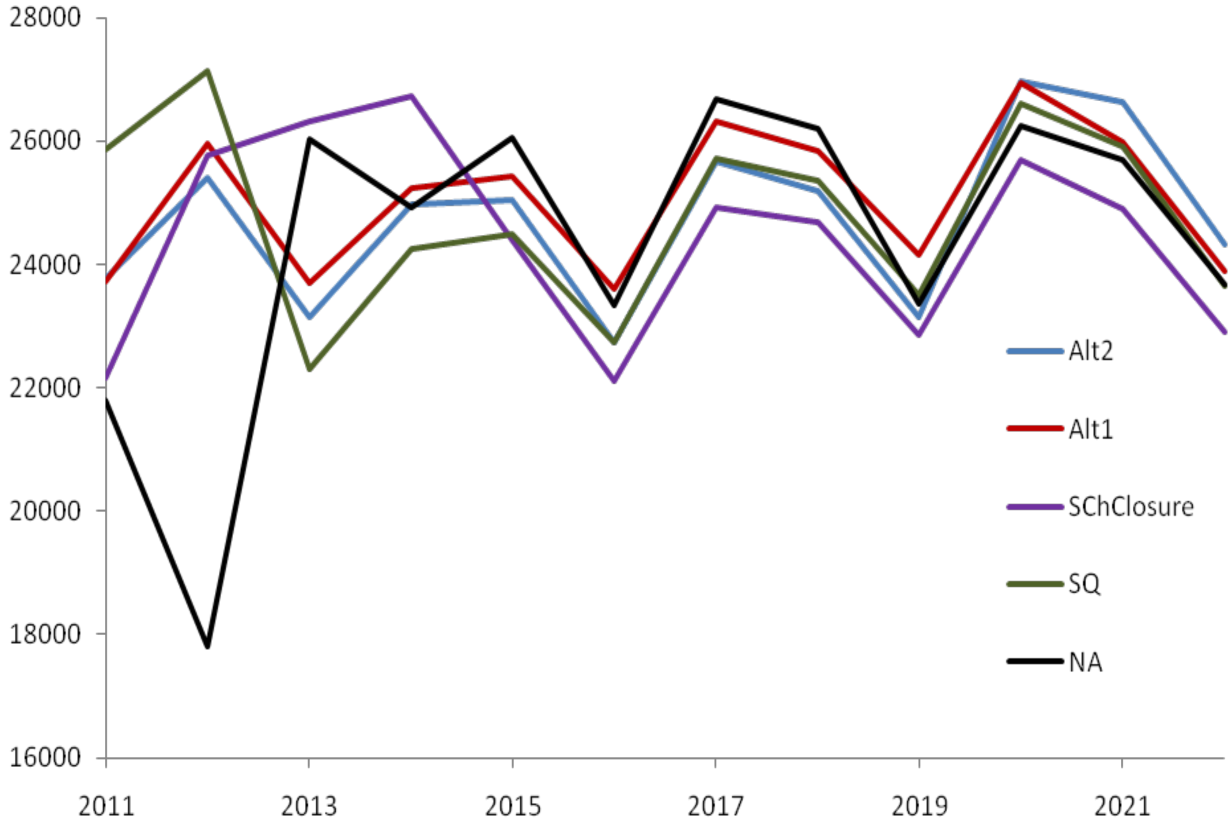
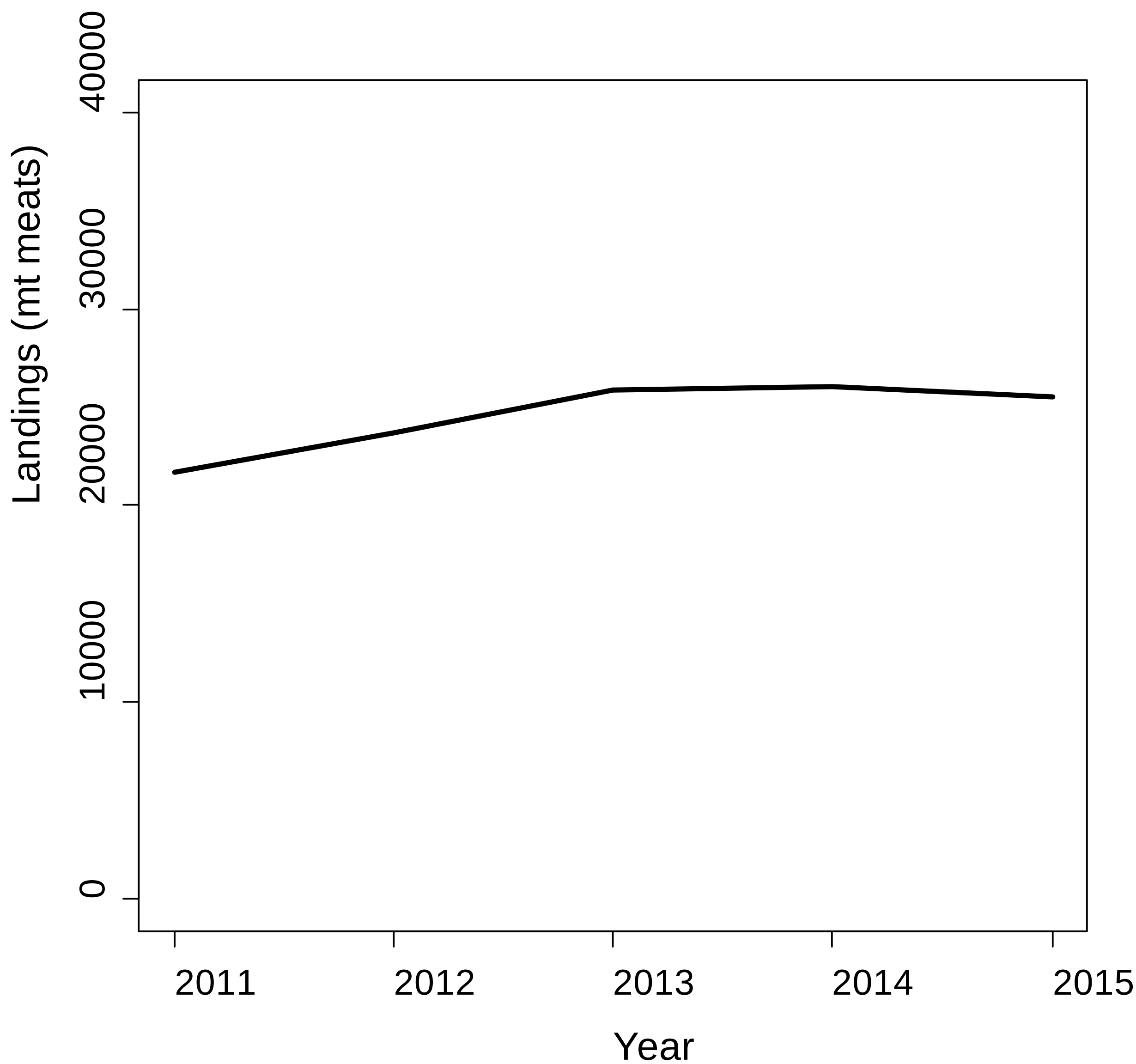


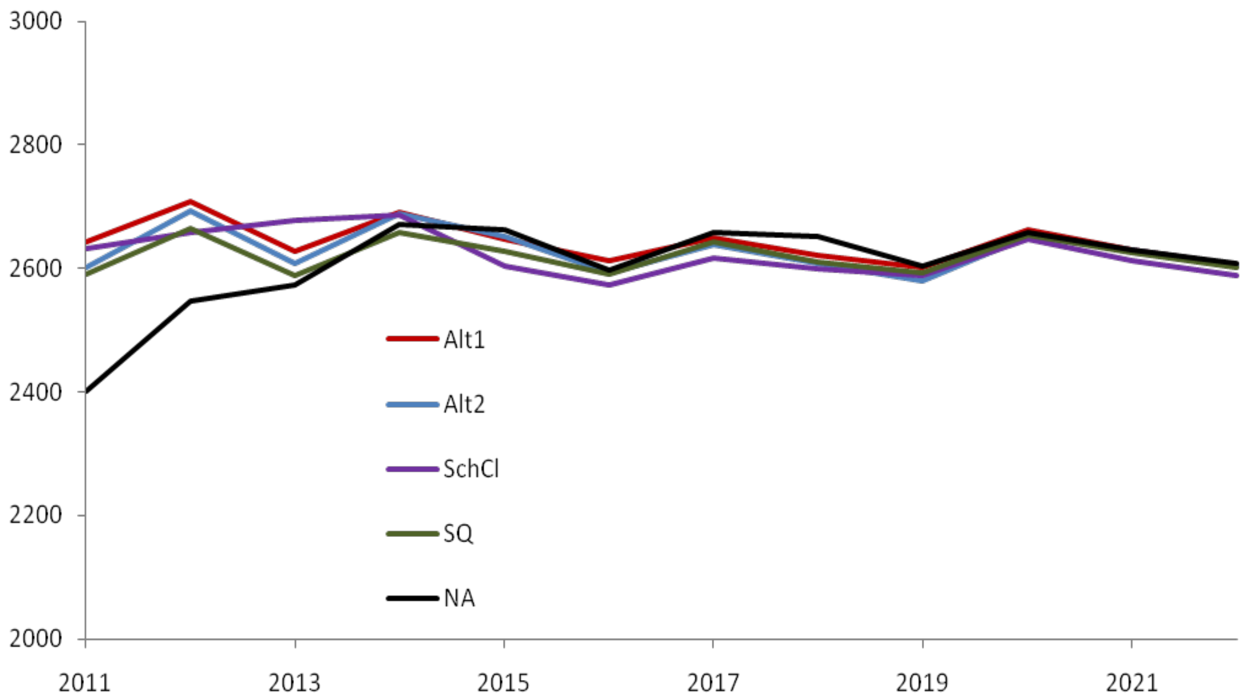
Figure 38 - Projected landings for the final Alternative 1 (2011-2013 allocation) including indicators of uncertainty and the mean estimate



5.1.2.3 Projected LPUE

- Long-term LPUE around 2,600 pounds per DAS for all alternatives.
- When F is held at 0.38 in open areas, LPUE stays closer to access area LPUE.
- Open area LPUE is expected to be over 2,400 lbs/day in 2011 and 2600 lbs/day in 2012.
- Alternative 1, the proposed action, has slightly higher estimates of open area LPUE.

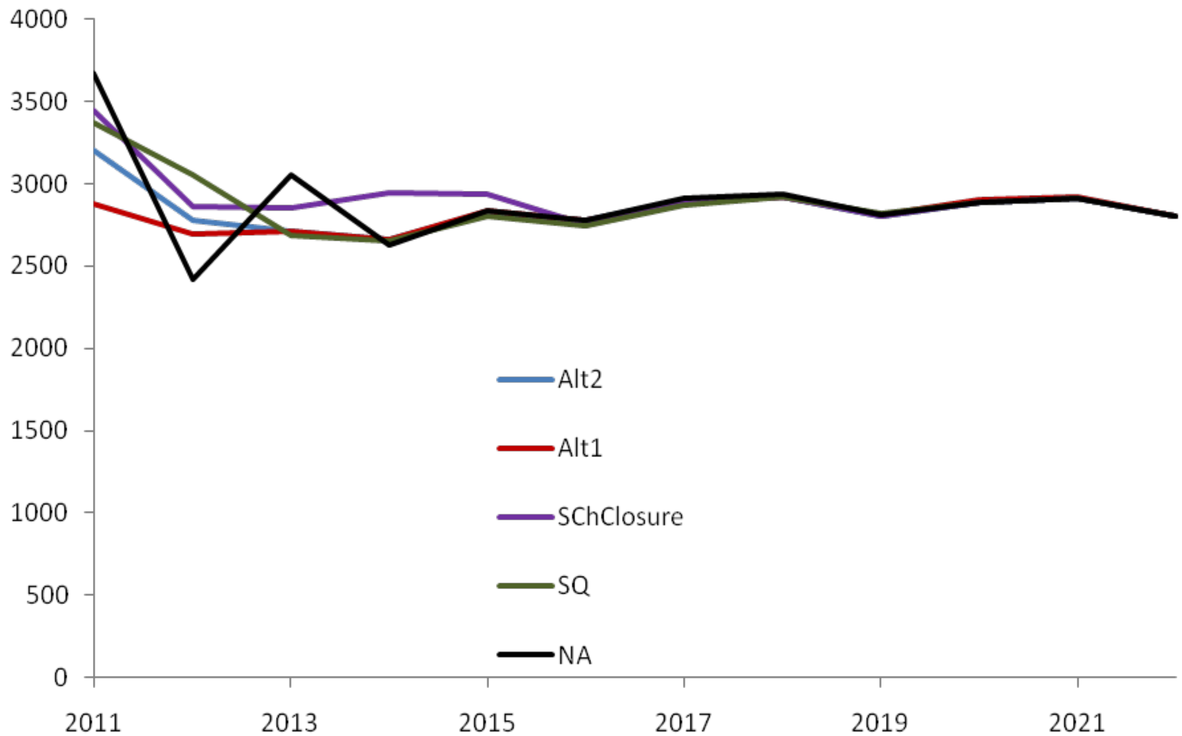
Figure 39 – Comparison of projected LPUE in open areas for the alternatives under consideration



5.1.2.4 Projected bottom area swept by area

- The model estimates that area swept in 2010 is about 5,000 sq. nautical miles – and that is about what the fishery has been in recent years.
- All alternatives under consideration are substantially lower than 5,000, especially Alternative 1 followed by Alternative 2.
- Long-term these come out around 3,000 – substantially lower than area swept has been in recent years.

Figure 40 – Comparison of projected area swept for the alternatives under consideration



5.1.2.5 Additional analyses related to Alternative 3

This section has been included to recognize that there are specific guidelines outlined in Amendment 10 relative to what should be considered when a new rotational area is proposed. Amendment 10 defines the criteria for closing an area to protect young scallops. Under adaptive area rotation, an area could close when the expected increase in exploitable biomass in the absence of fishing mortality exceeds 30% per year and re-open to fishing when the annual increase in the absence of fishing mortality is less than 15% per year. Identification of areas would be based on a combination of the NEFSC dredge survey and available industry-based surveys. The boundaries are to be based on the distribution and abundance of scallops at size; ten-minute squares are the basis for evaluating continuous blocks that may be closed. The guidelines are intended to keep the size of the areas large enough and regular in shape to be effective, while allow a degree of flexibility. The Council and NMFS are not bound to closing an area that meets the criteria and the Council and NMFS may deviate from the guidelines to achieve optimum yield.

If any areas qualify, the area would close to all scallop vessels and vessels would not be permitted in that area until a later date when biomass estimates project higher yields. The Council is not required to implement these rotational closed areas just because they meet the criteria recommended in Amendment 10 for new closures, but they should be considered.

Results from the 2010 survey suggest that small scallops have settled in parts of the Great South Channel. The PDT recommended consideration of an area to the north of the Nantucket Lightship closed area and west of Closed Area I; the top left coordinate of the polygon is 41 20' N and 69 30' W and the bottom left coordinate is 40 50'N and 68 50'W (Figure 49). Recruitment on GB has been below average since 2001 and has only improved in the last few years. High numbers of small scallops (<70 mm) were caught on 2007, 2008, 2009, and 2010 survey tows in this area. The SMAST video survey of this area also found high scallop recruitment in this area.

Physical area of proposed closure

Approximately 18% of the total "South Channel" region (from the general area rotation policies approved in Amendment 10[3]) would be included in the GSC closure under consideration, which meets the rotational closure criteria from A10. In comparison to open areas on Georges Bank the closure is 11% of the total Georges Bank open area.

[3] Section 5.1.3 of Amendment 10 describes the general area rotation policies set forth under Amendment 10 including the boundaries and distribution of rotational closures in the Northeast. There is guidance about how many areas should be in one region and what shape and size they should be. The analyses in Table 67 follows these policies in terms of providing the percent of area included in the closure alternative in FW22 – Great South Channel.

Table 67 – Physical area comparison of open versus closed with proposed GSC area

Region	Area km^2	% of Area Contained in Proposed GSC Closure
Proposed GSC Closure	2332	-
A10 South Channel Region	13129	18
A10 South Channel Region - excluding Proposed GSC Closure	10797	22
Georges Bank Open Area	20310	11
Georges Bank Open Area - Excluding Proposed GSC Closure	17978	13

In order to get a sense of expected impacts from this closure, it is useful to compare the projected exploitable biomass and LPUE estimates for the alternatives that close the area and the alternatives that do not (Figure 35 and Figure 39). The impacts of this closure are marginalized compared to years past because this alternative would close the area for only one year, compared to a three year option considered in the past. Therefore, total catch from this alternative (Alternative 3) is not much higher than the other alternatives considered, except for just after the area reopens. Since catch rates are equal or better in other areas, the long-term catch from this alternative is actually less than other alternatives considered. Compared to No Action Allocation Alternative, and the other alternatives that do not close the Channel (Alternatives 1 and 2) the benefits on the scallop resource overall are minimal from this measure (Alternative 3).

5.1.3 Summary of additional measures specific to limited access vessels and YT flounder

This framework includes the specific access area schedule and DAS allocations for all limited access scallop vessels. The impacts of these various allocation alternatives (Alternative 1, 2, and 3) on the scallop resource, including the No Action alternative, are summarized in Section 5.1.2. From the proposed allocation alternative, Alternative 1, a specific DAS compensation value is calculated for open area DAS if a GB access area closes early due to the YT TAC being reached. The process for setting open area DAS compensation was approved in a previous action; this document only sets the specific amount. No specific alternatives were set in this section (Section 2.5), the DAS compensation rate is an automatic procedure linked to the allocation alternative selected. Furthermore, Section 2.5.2 is not an alternative under consideration in this action; it was included as background since this is the first action following implementation of Amendment 15 and accountability measures relative to the YT flounder sub-ACL allocated to the scallop fishery. Therefore, no specific analyses are included in this action; they were covered in Amendment 15.

If new specifications are set based on Alternative 1 allocation alternative, the DAS compensation value is automatically updated as well. Therefore, the DAS compensation value is the result of the Council selecting Alternative 1 as the allocation alternative, the impacts are briefly described below, but there was not a direct Council decision to set this value, it is an automatic allocation based on the current estimate of LPUE described below.

Table 16 describes the various DAS compensation rates if one of the GB access areas close due to the YT TAC being reached. Since the compensation rates are determined by estimating an equivalent level of mortality, the overall impacts of this alternative on the scallop resource are expected to be neutral. For example, in Closed Area 1, a full trip is 18,000 lbs, and according to the projections for the Option 1 alternative, the average meat count in Closed Area I is estimated to be 10.6 meats per pound, implying that 18,000*10.6 = 190,800 scallops will be removed per trip. In the open areas, the average meat count is estimated to be 18.4 so that 190,800 scallops correspond to 190,800/10.6 = 10,370 pounds. The estimate of open area LPUE generated from the model for this alternative is 2441, so it will take 10,370/2441 = 4.25 DAS to land the same number of scallops, resulting in compensation of 4.25 DAS.

5.1.4 Measures for General category vessels

This section includes the fleetwide max trip allocations for LAGC vessels by area (Section 2.6). These trips are accounted for in the projections so will not have any additional impacts on the resource. If trips are not taken in these areas, LAGC catch is assumed to be taken in open areas instead. In general, catch rates are higher in access areas and many access areas are relatively close to shore, so it is assumed that most allocated trips will be taken. The No Action for this section is the trips allocated to the general category fishery in FY2010; compared to those allocations the proposed allocations are expected to have beneficial impacts on the resource since they are based on updated biomass estimates and are set to achieve optimum yield.

5.1.5 NGOM and Incidental catch TAC

The biological impacts to the scallop resource from the NGOM and incidental catch TACs are summarized in this section. For the NGOM TAC the alternative of 31,100 pounds (Section 2.6.3.2) is expected to reduce the chance of excess fishing in federal waters in the NGOM based on results of the recent scallop survey of that area. The 2010 NGOM TAC, the No Action alternative of 70,000 pounds increases that risk, but the PDT notes that a substantial portion of total catch from vessels with NGOM permits is coming from state waters, not included in the updated 31,100 pound TAC. Neither alternative (70,000 poujnds or 31,000 pounds) is expected to have substantial impacts on the resource or fishery since in recent years the catch levels have been below 20,000 pounds; therefore both NGOM options are expected to have little impact on the scallop resource in the Gulf of Maine.

Similarly, the target TAC for incidental permits is not expected to have impacts on the scallop resource. This is a very small component of total catch in this fishery and was established to provide continued access for vessels that caught scallops as bycatch. This catch is accounted for and removed from the ACL before allocations are made to the directed fleets, and if catch levels increase from this component of the fishery this target TAC can be increased. Therefore, there are no overall impacts from this fishery on the scallop resource.

5.1.6 TAC set-asides for research and observers

If approved under Amendment 15, set-asides for observer coverage and research would be removed directly from the ABC for this fishery, rather than a percentage of what is allocated to the fishery. Amendment 15 included this revision as well as allocating a fixed poundage for RSA to be 1.25 million pounds. The biological projections take both of these set-asides into account before allocations are made so no additional impacts are expected on the resource. The process for removing some catch for these set-asides has been approved in previous actions; this specifications package only sets the specific amount that will be set-aside. If new specifications are set in this action, the new set-asides will be updated as well. And if Amendment 15 is approved, 1.25 million pounds will be set-aside for research automatically, as well as 1% of the ABC for observers. Compared to 2010 set-asides values, the No Action set aside value, the proposed set-asides for observer and research are higher in 2011 and 2012. In 2010, just over 462,000 pounds were set aside for research in access areas and 269DAS. For observer coverage about 290,000 pounds and 135 DAS were set aside. This increased amount of set-aside for research and observers will not have impacts on the resource since this mortality has been accounted for before allocations are made to the directed fisheries.

Indirect benefits to the resource are expected based on the results of research projects funded through this set-aside program. The improvements added to the list of research priorities (Section 2.7.2.2.2), compared to No Action, the priorities used in the 2011 announcement, are expected to have indirect benefits on the resource since they have been updated and expanded to meet the current research needs.

5.1.7 Minimizing Impacts of Incidental Take of Sea Turtles

5.1.7.1 Alternatives to minimize impacts of incidental take of sea turtles

5.1.7.1.1 No Action regarding RPM

No Action regarding the RPM is a rollover of the RPM that is currently in place in FY2010 as set by FW21. Specifically, vessels are restricted to take a maximum of two access area trips in the Mid-Atlantic between June 15 and October 31, and both Delmarva and Elephant Trunk are closed to all scallop vessels between September 1 through October 31. These measures were designed specifically for the 2010 fishing year to minimize impacts on sea turtles up to a level that is expected to have more than a minor impact on the scallop fishery. In general, the impacts of the 2010 RPM, the No Action RPM alternative for this action, are expected to be relatively similar to most of the RPMs under consideration since vessels would experience similar constraints on when and where fishing can take place. Some of the measures considered in FW22 have higher impacts on the scallop resource, and some lower. See Section 5.3.8 for a detailed description of how the RPM measures under consideration are expected to impact fishing mortality, thus impacts on the resource.

The aspect of the No Action alternative that could have beneficial impacts on the scallop resource is the seasonal restrictions since they overlap with poor meat weight months

(September-October) which could shift effort from those areas into seasons with mostly higher average meat weights.

5.1.7.1.2 Restrict the number of open area DAS an individual vessel can use in the Mid-Atlantic during a certain window of time

This alternative would set a maximum on the number of allocated open area DAS each limited access vessel can use in the area defined as the Mid-Atlantic during the time periods under consideration (June 15 - October 31).

It is difficult to predict the impacts of this measure on the scallop resource because impacts are based on how vessels react to this restriction. If vessels respond by fishing in similar areas but shift effort to times of the year with greater meat weight yields (spring and summer) then impacts on the resource will be minimal, even positive. But if vessels fish these open area DAS in times of the year that have lower meat weight yields impacts on the resource will be negative. In addition, if vessels fish on GB during this season instead, impacts on *F* in that area may be higher than expected in the biomass projections.

This alternative will have more impacts the more DAS it impacts. Overall, the lower the percent of effort shift from the turtle season to the rest of the year the more impacts will be minimized on the resource because effort shifts are expected to have impacts on *F* that are difficult to predict. Similar to No Action (RPMs in place in 2010) the impacts of this alternative are affected by changes in fishing behavior that are difficult to predict. However, the overall impacts are not expected to be significant since the total open area DAS allocations are much lower now than in years past.

5.1.7.1.3 Restrict the number of access area trips in the Mid-Atlantic that can be used during a certain window of time

This alternative would restrict the number of allocated access area trips that can be taken in the Mid-Atlantic during the turtle season, June 15 - October 31.

It is difficult to predict the impacts of this measure on the scallop resource because impacts are based on how vessels react to this restriction. If vessels respond by fishing in similar areas but shift effort to times of the year with greater meat weight yields (spring and summer) then impacts on the resource will be minimal, even positive. But if vessels fish AA trips in times of the year that have lower meat weight yields impacts on the resource will be negative. Overall, the lower the percent of effort shift from the turtle season to the rest of the year the more impacts will be minimized on the resource because effort shifts are expected to have impacts on *F* that are difficult to predict. Similar to No Action (RPMs in place in 2010) the impacts of this alternative are affected by changes in fishing behavior that are difficult to predict. However, the overall impacts are not expected to be significant since the total number of Mid-Atlantic access area trips is fewer under FW22 than in recent years.

5.1.7.1.4 Consider a seasonal closure for Delmarva

This alternative would consider a seasonal closure of the entire access area to both general category and limited access scallop vessels for either the months of September and October or July through October.

The shorter period, September-October is expected to have beneficial impacts on the scallop resource if effort is shifted into other times of the year similar to recent behavior changes from the two-month seasonal closure of ETA. In the Mid-Atlantic, the southern range of the scallop resource, there is a seasonal cycle in meat yield that increases from March to July and then declines until October-November (Schmitzer, 1988). Therefore, reducing effort in that area during months of lower meat weight yields will reduce mortality. In 2007 and 2008, effort in the Mid-Atlantic increased in March, April, August, November and December compared to overall fishing time in years before that (Figure 41). Meat weights are lower in November and December compared to the annual average, but higher in March, April and August. So if effort from Sept and/or Oct is primarily shifted into months with higher meat weight yields, impacts on *F* may be reduced, having beneficial impacts on the scallop resource.

However, if effort is primarily shifted to months with lower meat weights like November and December, impacts on F will be increased; meat weights are lower during this period of the year, so more scallops will be harvested for the same catch. This result was observed to some degree from the turtle seasonal closure in Delmarva for FY2010. In 2009 there was no seasonal closure, and in 2010 there was a two month closure in that area for September and October. Compared to fishing patterns in 2009, in 2010 some of that effort seems to have shifted to months with better meat yields like April and June, but a lot has shifted to months with below average meat yields, November and December (Figure 42). It should be noted that the seasonal closure is not the only factor that would influence when trips are taken. Many variables come into play that influence when and where a vessel fishes, but this comparison does suggest that impacts on *F* are potentially negative if more effort shifts to seasons with lower meat weights. Similar to No Action (RPMs in place in 2010) the impacts of this alternative are affected by changes in fishing behavior that are difficult to predict. However, the overall impacts are not expected to be significant and would be similar to No Action since the No Action alternative includes a seasonal closure in Delmarva.

Figure 41 – Percent change in Mid-Atlantic area fishing time by month in recent years compared to 2003-2005

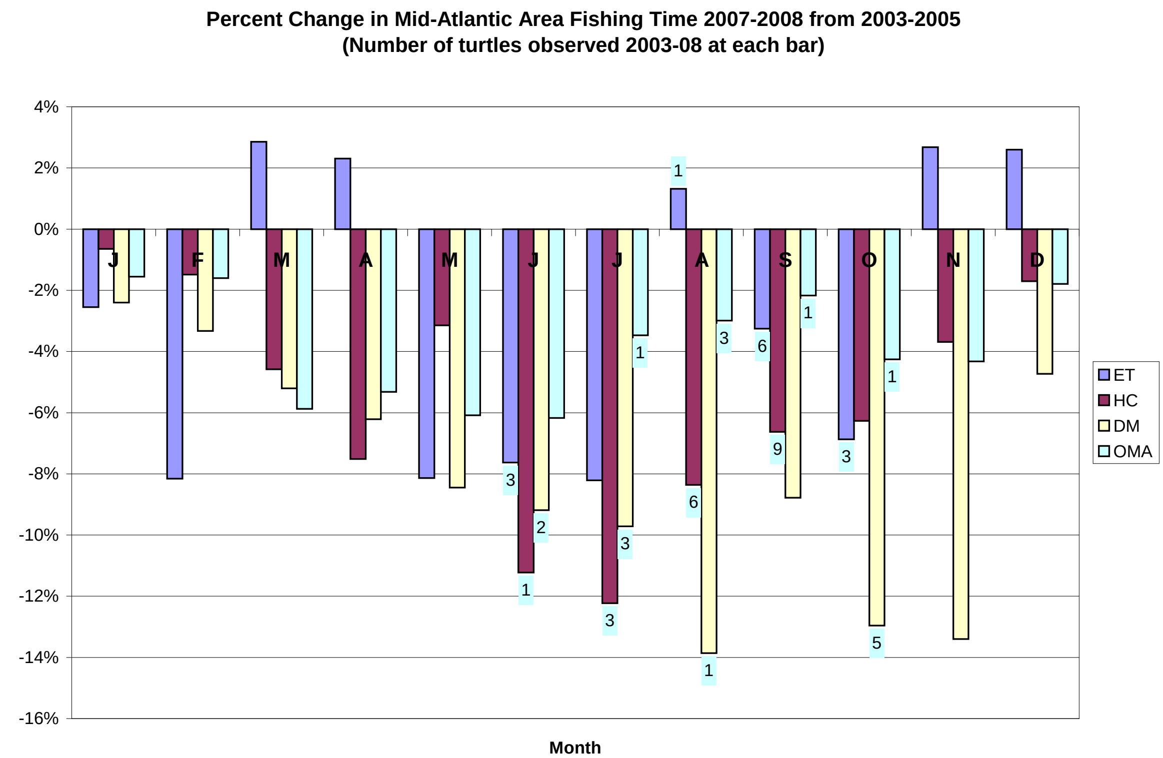
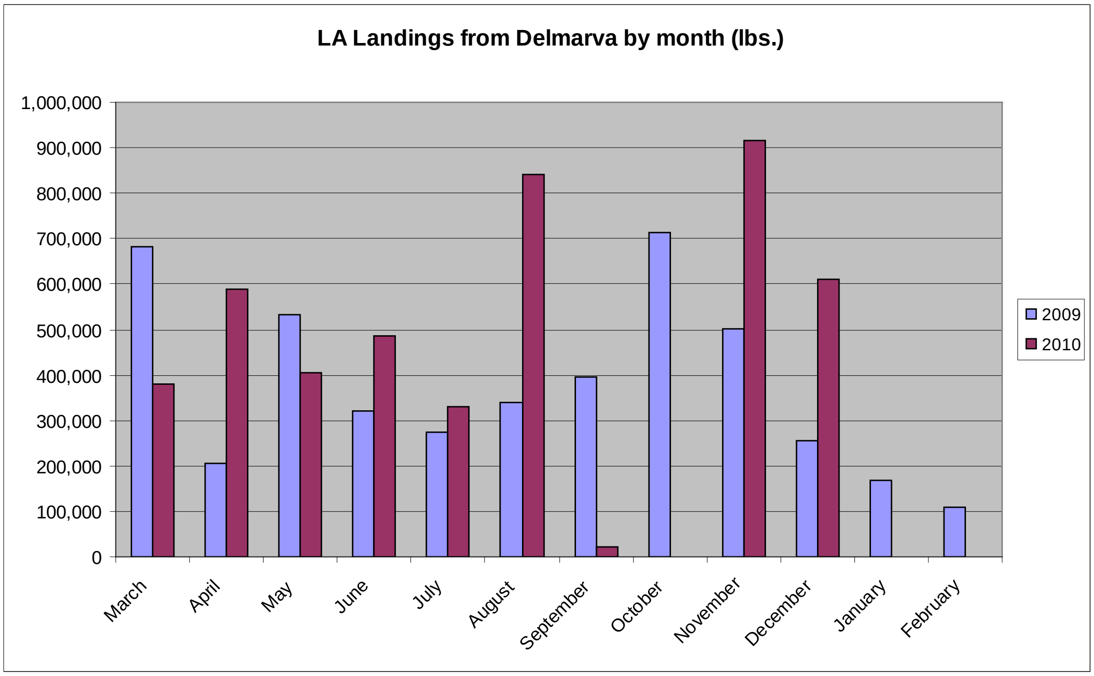


Figure 42 – Scallop Catch by month from limited access vessels fishing in the Delmarva access area (FY2009 and FY2010) FY2010 is preliminary and incomplete since the fishing year is not over yet.



5.1.7.1.5 Consider a seasonal closure for Hudson Canyon

This action is considering two seasonal closures for Hudson Canyon as well, but for 2012 only because this action will be implemented late, June 2011 at best.

The shorter period, August-September is expected to have some negative impact on fishing mortality, but not as much as the longer season from July-September, because that includes the month of July that has high meat weights compared to the annual average. By including that season, impacts on *F* are estimated to be above a 0.5% change from that RPM, which is greater than the amount discussed in the past has having more than a minor impact on the fishery. Similar to No Action (RPMs in place in 2010) the impacts of this alternative are affected by changes in fishing behavior that are difficult to predict. However, the overall impacts are not expected to be significant since this is only for one year and similar seasonal closures were imposed in both Delmarva and Elephant Trunk in recent years.

5.1.7.1.6 Combined RPM measures

Two combined RPM measures have been considered in this action:

- *One trip max in MA access areas and seasonal closure in Delmarva (Sept and Oct)*
- *For 2012 and 2013 – seasonal closures in Delmarva for July - Oct and in Hudson Canyon for August-Sept*

Section 5.3.8.1.3 discusses the impacts on *F* from the various RPM alternatives. In general, the more restrictions that are placed on when and where a vessel can fish the more uncertain the impacts are because fishing behavior cannot be predicted precisely. Overall, the more effort that is shifted from seasons with higher meat weights to seasons with lower meat weights, the greater the potential impacts on the scallop resource. The one trip max alternative has more certain impacts because each vessel is restricted to one trip during the entire turtle window. When a seasonal closure is added there may be some added benefits for the scallop resource by preventing Delmarva trips in September and October and shifting them until June through August when meat weights are better. Or the seasonal closure in Delmarva could cause some vessels not to use their Delmarva trip at all and instead use their HC trip during September and October instead, which could have negative impacts on *F* compared to if that vessel would have fished that trip during a higher meat weight period. Overall, the impacts of seasonal closure options are more uncertain in terms of their impact on *F* and turtles since some or all of that effort may end up shifting to other months when turtles are still present (June – August). While impacts are more uncertain, they are not significant overall since the level of effort is lower than it has been in recent years.

Combining HC and DMV closure will reduce the number of trips during the turtle season less compared to a one trip maximum because the latter restricts the total number of trips that can be taken by an individual vessel during the entire turtle season. Whereas with this combined measure it is possible that some vessels could take their Delmarva trip in June and their HC trip in June, July, or October. This increases the potential for more trips to be taken during the entire turtle season (June15 - October) because vessels are not restricted to one trip each. Again, impacts of seasonal closures on *F* are more uncertain because it depends on how vessels respond to the closure and when they decide to fish as a result of the closure. If some vessels end up fishing in months like June and July when meat weights are higher as a result of this combined measure, impacts on *F* will be slightly positive compared to the one trip max alternative (Table 74). Similar to No Action (RPMs in place in 2010) the impacts of this alternative are affected by changes in fishing behavior that are difficult to predict. However, the overall impacts are not expected to be significant since the total number of trips allocated in the Mid-Atlantic are lower than in recent years.

5.1.8 Modifications to VMS

As described in Section 2.10, two alternatives were considered: the No Action, which would not change the VMS regulations and Alternative 2.11.2, which would allow a vessel to turn their VMS unit off of it does not intend to land scallops. Neither of these measures is expected to have a direct impact on the scallop resource. However, if enforcement is compromised by loosening VMS requirements (Alternative 2.11.2) more scallop mortality could result having negative impacts on the resource compared to No Action.

5.1.9 Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line

Alternative 2.11.2 would reduce the possession limit seaward of the VMS demarcation line from 100 bu to something less (i.e. 65 or 75 bu). (It should be noted that "bushels" here refers to the standard measurement, and that the orange baskets used in the fishery are recognized to be equal to 1.3 bushels.) NMFS Enforcement agents have voiced concerns that the regulations which allow for LAGC vessels to possess up to 100 bu of scallops seaward of the VMS Demarcation Line but prohibit vessels from possessing more than 50 bu when shoreward of the VMS Demarcation Line has influenced fishing behavior. There are reports that vessels are targeting more scallops and buoying them off to be landed the next day.

The PDT discussed that this activity did not seem to be illegal, but agreed that 100 bushels may be excessive. The additional bushels were permitted through Amendment 11 to acknowledge that there is seasonal and spatial variation in meat yield, so some flexibility is warranted, but 100 bushels may be too high. The PDT is not sure how prevalent this activity is and if there are any quality and mortality issues. The Committee decided to forward this issue to the AP to see how widespread this issue is and to ask the PDT if this is a significant problem or not and to consider what a more appropriate bushel equivalent would be to account for meat weight variations. The Committee requested that the PDT review the data available to analyze what the possession limit should be and what impacts on mortality may be and continue from there.

In addition, since the initiation of this action, Amendment 15 proposes to change the possession limit from 400 pounds to 600 pounds. This may make the current bushel number more in tune with the poundage.

Observer data was used to investigate the average pounds per bushel encountered from access area trips, where observers obtain the meat weight of one basket (1.3 bu) of shucked scallops per watch. Data from 2006-2009 was given by month and area (n = 19777). The mean pounds per basket was 8.01 (6.15 pounds per bu) with a standard deviation of 1.29. Weights were highest in March through July (max = 8.78 lbs/basket, May) and lowest in December (6.78 lbs/basket). By area they were highest in Nantucket Lightship (8.36 lbs/basket) and lowest in CAI and CAII (7.65 and 7.64 lbs/basket, respectively). While there were some outliers at both the low and high end of the range of data (Figure 43), it is not unreasonable to move forward with a possession limit based on the observed data instead of the status quo. At an average of 8 lbs/basket, and a desired possession limit of 600 lbs, 75 baskets would be sufficient (97.5 bu). The standard deviation of the data set is 1.29, and it is probably not as helpful to look at the upper bound since we wish to err on the side of lower weights and be sure people are able to harvest their quota. The lower bound of the meat weight data is 6.71 lbs/basket, which would translate to a basket count of approximately 90 (117 bu). Data from VIMS survey samples had an average weight from Delmarva for August (the month with worst meat weights) of 7.34 with a standard deviation of 0.59. This yields a reasonable limit of about 80 baskets (104 bu).

Based on this information and the updated possession limit the PDT would recommend a value of 100 bushels (status quo), or potentially somewhat higher to account for the increased possession limit. But the PDT was supportive of 100 bu. even with a 600 possession limit to further reduce incentive of shell stocking. Any measure that influences changes in fishing behavior, by increasing the in-shell possession limit, could have negative impacts on the resource compared to No Action (Section 2.11.1) if scallops are buoyed off and retrieved at a later time.

Conversely, any measure that reduces incentive to shell stock, the No Action alternative, is viewed as having a positive impact on the resource compared to increasing the possession limit.

Figure 43 - Histogram of shucked basket weights from observed trips in access areas, n = 19777

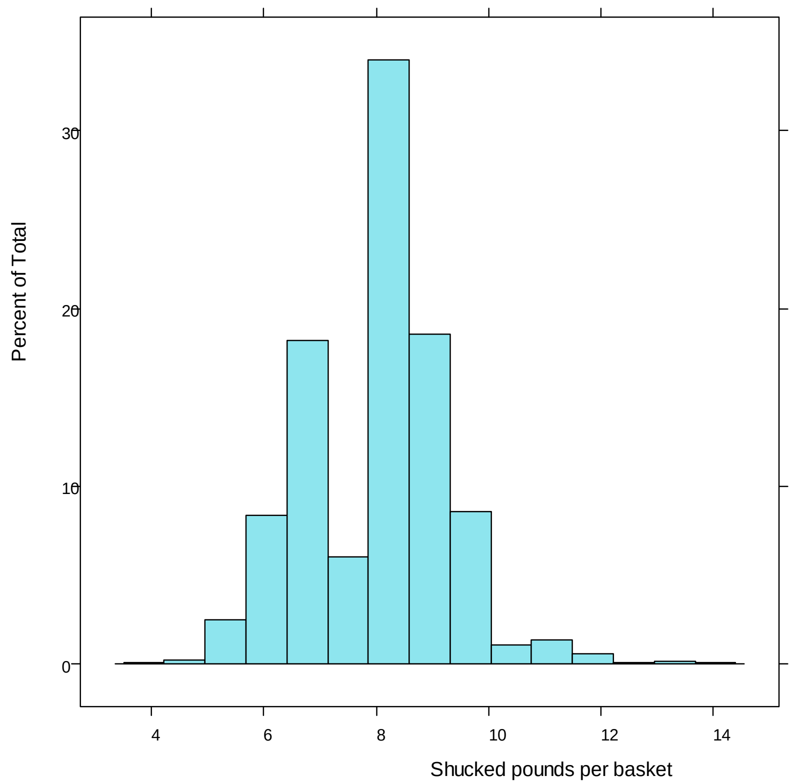


Figure 44 - Boxplot of meat weight per basket by month; black line is median, box encompasses interquartile range, and dots are outliers

Figure 45 - Boxplot of meat weight per basket by area; black line is median, box encompasses interquartile range, and outliers

5.1.11 Elimination of reference to GB access area schedule in regulations

Neither the No Action alternative (2.13.1) nor the alternative to eliminate reference to the GB access area schedule in the regulations (2.13.2) is expected to have direct impacts on the scallop resource; this issue is administrative in nature.

5.2 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The following sections summarize the impacts of various alternatives and groups of alternatives on the physical environment and EFH. The effects on the physical environment are encompassed in the assessment of effects on EFH since that is the dominant component of the physical environment impacted by scallop fishing.

5.2.1 Acceptable Biological Catch

This alternative sets Acceptable Biological Catch (ABC) values for 2011-2013 (with the assumption that a subsequent framework action will update the 2013 values in advance of that fishing year). ABC is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. Acceptable Biological Catch for the scallop fishery is 69.0 million lbs. in 2011 and 73.3 million lbs. in 2012. Reduced for discard and incidental catch mortality, the ABC available to the fishery is 60.1 million lbs. for 2011 and 63.8 million lbs. for 2012.

For comparison, the No Action ABC (2010 ABC) was set at 65.2 million pounds, including an estimated 7.4 million pounds for non-yield fishing mortality (discards and incidental mortality). Therefore, the overall No Action ABC for the fishery, excluding discards and incidental mortality is 57.8 million pounds.

Any EFH impacts associated with these ABC values are rolled into the discussion of the allocation alternatives (section 5.2.2), because given similar ABC values available to the fishery each year, biological and EFH impacts will vary according to the timing and spatial distribution of catches, both of which are accounted for in the modeling work done to evaluate the allocation alternatives. Overall, both the No Action ABC and the proposed ABC have neutral impacts on EFH.

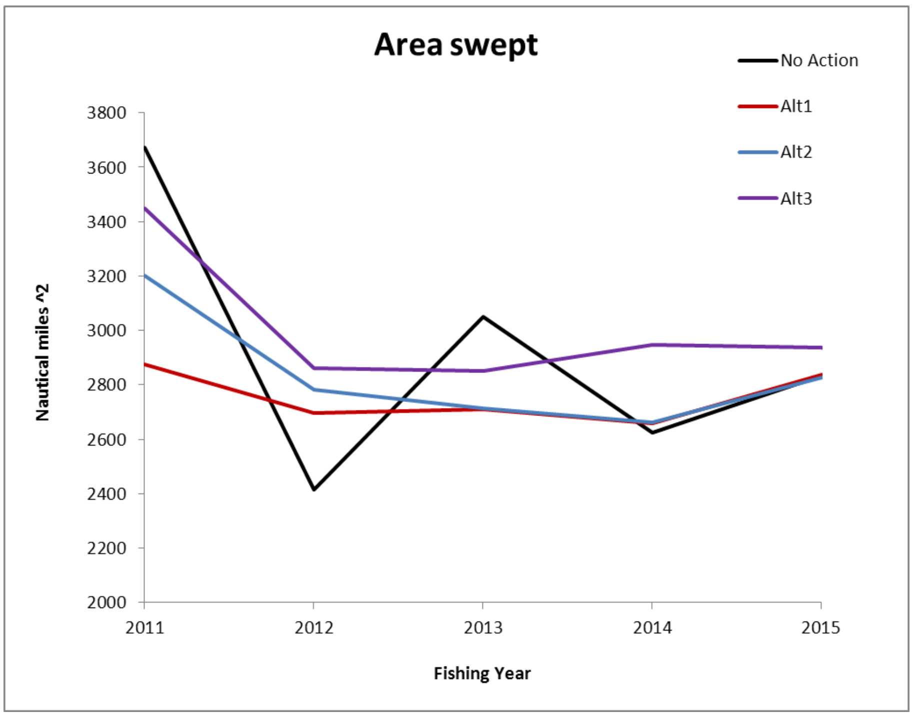
5.2.2 Summary of FW22 Allocation Alternatives

The options under this alternative allocate fishing effort between open and access areas for fishing years 2011 and 2012, as shown in Table 8. Note that for this action, Status Quo is equivalent to 2010 measures, since No Action is actually not the same as 2010 allocations because of the way the access area program is implemented. The Status Quo alternative is shown for reference but as it cannot be implemented; impacts of Status Quo will not be discussed further. Relative impacts on the scallop resource of No Action as compared to Status Quo and each of the three allocation alternatives are detailed in the biological impacts section of this document.

Each of these alternatives assumes implementation of Amendment 15 and the associated change in the size of the area available for access in CAI based on EFH boundaries changing. Amendment 15 also includes a provision allowing for year three (in this instance, 2013) allocations to be developed in specifications frameworks. The 2013 allocations (Table 14) will go into effect March 1, 2013 if the next specifications framework is delayed beyond the start of the 2013 fishing year.

Figure 46 shows projected area swept for the upcoming fishing years under No Action and each of the allocation alternatives. Area swept is assumed to relate to the relative magnitude of EFH impacts between the various alternatives, with greater area swept indicating relatively increased impacts and lesser area swept indicating relatively decreased impacts. For the next three fishing years (2011-2013), alternative 1 has the best overall performance in terms of area swept/reduction in EFH impacts, followed by alternative 2, and then by alternative 3. No Action has lower LPUE and higher area swept/EFH impacts in the first year. In 2012, No Action has no trips allocated in any of the GB access areas, or in HC, so although area swept/EFH impacts are projected to be much lower, total landings are also lower (17,797 mt for No Action as compared with approximately 25,000 mt for the other three alternatives).

Figure 46 – Projected area swept in nm^2 under No Action and each of the three allocation alternatives.



The No Action allocation alternative maintains, during fishing years 2011 and 2012, the TACs from 2010 and the associated limited access open area DAS, as well as the general category quota allocations. The schedule of access area trips is slightly different than that in place for 2010, due to a predetermined opened/closed schedule for the access areas (specifically, the Nantucket Lightship Access Area will be closed during 2012). The no action alternative is summarized below. EFH impacts for the allocation alternatives are compared to this no action alternative in section 5.2.2.

Table 68 – Summary of No Action alternative related to fishery specifications.

TAC for fishery (includes all landings, set-asides, and incidental catches)	21,445 mt	21,445 mt	21,445 mt
Open area DAS (FT/PT/OCC vessels)	38/15/3	38/15/3	38/15/3
ETA trips (FT/PT/OCC vessels); GC total	2/up to 2/up to 1; 1377	2/up to 2/up to 1; 1,377	2/up to 2/up to 1; 1377
DMV trips (FT/PT/OCC vessels); GC total	1/up to 1/up to 1; 714	1/up to 1/up to 1; 714	1/up to 1/up to 1; 714
NLA trips (FT/PT/OCC vessels); GC total	1/up to 1/up to 1; 714	1/up to 1/up to 1; 714	None – area closed
Turtle restrictions	ETA and DMV closed in September and October; limited number of trips during June 15 – August 31	ETA and DMV closed in September and October; limited number of trips during June 15 – August 31	ETA and DMV closed in September and October; limited number of trips during June 15 – August 31
Compensation if NLA closed for YT	5.8 DAS	5.8 DAS	n/a – area closed

Alternative 3 would close an area of the Great South Channel to scallop fishing during 2011 and then reopen it as an access area with controlled effort in 2012. After 2012 the area would continue as an access area until growth rates slow down and it reverts back to an open area. Vessels would be allocated 2.5 trips in 2012 (or possibly fewer).

To estimate the EFH impacts from this closure, it is useful to compare the area swept estimates for the alternative that closes the area (alternative 3) and the alternatives that do not (alternatives 1 and 2). Because this alternative would close the area for only one year, compared to a three year GSC option considered in the past, total 2012 catch for all areas combined from alternative 3 is not much higher than total catch under the other alternatives considered. Area swept and presumably EFH impacts are projected to be higher under the GSC alternative (Alt. 3) in each of the next three fishing years (2011-2013). Despite good recruitment in the area, since catch rates in the GSC are less than in other areas, it is not advantageous to direct fishing into the area from an EFH perspective, assuming roughly equivalent landings between alternatives (2012 landings are forecast to be similar for all alternatives: 25,964 mt Alt. 1; 25,411 mt Alt. 2; 25,778 mt Alt. 3).

In addition, the GSC area was identified as having vulnerable structural habitat features during development of the Omnibus EFH Amendment. While it remains uncertain whether management action will be taken in the Omnibus EFH Amendment to restrict the type or amount of fishing in portions of the GSC, establishment of a new habitat management area in the GSC has been discussed as a possible option for that action.

5.2.3 Summary of additional measures for specific to limited access vessels

This framework includes the specific access area schedule and DAS allocations for all limited access scallop vessels. The impacts of these various alternatives on EFH, including the No Action alternative, are summarized in Section 5.2.2. From the selected allocation alternative a specific DAS compensation value is calculated for open area DAS if a GB access area closes early due to the YT TAC being reached.

This previously approved process allocates open area DAS if the 10% yellowtail flounder (YT) bycatch TAC is reached and the Georges Bank access areas close. The prorated amount is calculated to achieve an equal amount of scallop mortality per DAS. Open area compensation rates will be calculated for NL, CA1, and CA2 once an allocation option is selected by the Council (Table 16).

It is difficult to predict whether impacts to EFH would be negative, positive or neutral if one or more of the access areas close and open area fishing occurs. One factor is whether area swept increases when fishing the open area DAS allocation, as compared to the access trip. However, impacts to EFH resulting from the same amount of area swept may vary depending on where those areas are and what types of seabed habitats are present, so another factor is where fishing is displaced to if an access area closes due to bycatch. Overall, it is unknown if effort will be moved to areas with greater or less impacts on EFH; however, the amount of total effort expected to shift is limited, therefore impacts are non-significant.

5.2.4 Measures for General Category Vessels

Allocation for limited access general category IFQ vessels
This alternative sets allocations for limited access general category IFQ vessels (Table 19). These trips are accounted for in the projections so will not have any additional impacts on the resource or on EFH, in addition to those discussed in 5.2.2. If trips are not taken in these areas, LAGC catch is assumed to be taken in open areas instead. In general, catch rates are higher in access areas and many access areas are relatively close to shore, so it is assumed that most allocated trips will be taken. Compared to No Action, 2010 allocations, the total allocation to the general category fishery is higher, 2.3 million pounds under No Action and over 3 million pounds in 2011 and 2012 under the proposed action, but this increased catch is accounted for in the updated projections for Alternative 1; which does have lower total area swept than the No Action alternative.

Northern Gulf of Maine (NGOM) Hard-TAC
This alternative approves a separate hard TAC for the NGOM area for 2011 and 2012. Vessels would be restricted to fish in this area under a 200 pound possession limit until the overall hard-TAC was reached. The hard TAC for 2010 was 70,000 pounds; however based on the results of a recent stock assessment, the PDT concludes that the hard-TAC for the NGOM should be lowered to 31,100 pounds, so both alternatives are being considered.

As compared to the current allocation, this lower TAC alternative may reduce the potential for fishing effort, and thus bottom contact and EFH impacts, in this region from this segment of the fishery. However, it is worth noting that it appears unlikely that the TAC will be landed next year, based on landings from 2008-2010. In 2008 the fishery landed 9,939 pounds (14% of TAC), in 2009 catch was 15,534 (22% of TAC), and to date for 2010 catch is at 3,869 through September. Either alternative (70,000 lbs or 33,100 lbs) would allow for more fishing effort and landings in this region compared to what the fishery has recently harvested.

Estimate of catch from LA incidental catch permits

Amendment 11 included a provision that the Scallop FMP should consider the level of mortality from incidental catch and remove that from the projected total catch before allocations are made. This alternative describes the PDT estimate and the value that was removed from the total projected catch before allocations to the limited access and general category fisheries were made.

The 2010 target TAC for LA incidental catch permits was set at 50,000 lb. While catch for this permit type has been substantially lower than this TAC in recent years, the PDT discussed that there may be some level of reporting uncertainty so it may be worth keeping the TAC at 50,000 pounds for now and re-evaluating it in the next framework.

This permit category represents a very small percentage of scallop landings such that any EFH impacts resulting from the harvest of this resource are likely to be minimal. While catches have remained well below the 50,000 lb limit between 2007 and 2009, there was an increase in incidental catch permit landings over that period. Thus, the actual amount of fishing effort and landings for the next two years could be higher than in past years under this alternative, but impacts on EFH are minimal.

5.2.5 TAC Set-Asides for Observers (1%) and Research (1.25 million pounds)

Research priorities for 2011

This alternative identifies research priorities for 2011. These priorities were approved by the Committee prior to this action so that a notice of available funding could be announced in June 2010, before final action of this framework. Those related to most directly to habitat include:

- Identification and evaluation of methods to reduce habitat impacts, including, but not limited to: broader investigation of variability in dredging efficiency across habitats, times, areas, and gear designs; and research on habitat effects from scallop fishing and development of practicable methods to minimize or mitigate those impacts.
- Habitat characterization research including, but not limited to: video and/or photo transects of the bottom within scallop access areas and within closed scallop areas and in comparable fished areas that are both subject and not subject to scallop fishing before and after scallop fishing commences; development of high resolution sediment mapping of scallop fishing areas using Canadian sea scallop industry mapping efforts as an example process; identification of nursery and over-wintering habitats of species that are vulnerable to habitat alteration by scallop fishing; and other research that relates to habitats affected by scallop fishing, including, but not limited to, long-term or chronic effects of scallop fishing on marine resource productivity, other ecosystem effects, habitat recovery potential, and fine scale fishing effort in relation to fine scale habitat distribution. In particular, projects that directly support evaluation of present and

candidate EFH closures and HAPCs to assess whether these areas are accomplishing their stated purposes and to assist better definition of the complex ecosystem processes that occur in these areas.

Research priorities for 2012-2013

This alternative identifies research priorities for 2012-2013. The habitat-related priorities listed above for 2011 are also on the 2012-2013 list. Additional habitat-related priorities include:

- If a habitat research area is identified in a future action, allow RSA funds to be used for projects to enhance scallop production using rotational strategies.
- Continue scallop dredge environmental impact studies.

For both years, these research priorities may have long term benefits to EFH if the projects approved improve our ability to manage fisheries in a way that reduces impacts to habitat. While these benefits are very difficult to quantify and may only be fully realized over a period of many years, it is expected that setting these research priorities may reduce impacts to EFH.

Research and Observer Set-Asides

This alternative defines the research and observer set-asides for fishing years 2011 and 2012 for each of the three allocation options (Table 24). These are consistent with the modified set-aside approach that will go into effect with Amendment 15 (i.e. fixed poundage of RSA; 1% observer set-aside taken from ACL). The amounts of catch set-aside for these purposes are administrative in nature and are not expected to have significant positive or negative impacts on EFH. However, it should be noted that the total amount of catch available for research is greater than it has been historically, so there may be indirect benefits to EFH if more resource is available to fund EFH related projects.

5.2.6 Efforts to Minimize Incidental Take of Sea Turtles as per the March 14, 2008 Scallop Biological Opinion

On March 14, 2008, NMFS completed an ESA Section 7 Consultation on the Atlantic Sea Scallop Fishery Management Plan. One RPM requires a limit of effort in the Mid-Atlantic during times when sea turtle distribution is expected to overlap with fishing activity; the other four are related to ongoing research needs and identification of measures to reduce interactions and/or the severity of such interactions. These alternatives and their potential impacts to EFH are discussed below.

No action for RPM measure

Under the No Action alternative, there would be no specific measures in FW22 to comply with RPM1 in the Biological Opinion. No action is expected to have the least impacts on EFH of all the RPM measures because it allows the scallop fleet to harvest the resource at the optimum times from economic, meat yield, weather, and other perspectives. In particular, harvesting scallops when meat yields are higher results in lower area swept per trip (given fixed trip limits), and thus lower impacts to EFH. However, the influence of the various turtle measures on fishing behavior, and thus on EFH impacts, are difficult to predict with any precision.

Restrict the number of open area DAS a vessel can use between July and September in the Mid-Atlantic

This alternative would set a maximum on the number of allocated open area DAS each limited access vessel can use in the area defined as the Mid-Atlantic from July 1 through September 30. It is difficult to predict the impacts of this measure on EFH because impacts are based on how vessels react to this restriction. If vessels respond by fishing in similar areas but shift effort to spring and summer when meat weight yields are higher, then impacts on EFH will be minimal, even positive. But if vessels fish these open area DAS in times of the year that have lower meat weight yields, impacts on the resource are likely to be negative. In addition, if effort shifts to GB during this season instead, impacts on fishing mortality, and thus on EFH, in that area may be higher than expected in the biomass projections.

Restrict the number of access area trips in the MA that can be used between June 15 and Oct 31

This alternative would restrict the number of allocated access area trips that can be taken in the Mid-Atlantic between June 15 and October 31. Because the total number of trips allocated for the year will not change, these access trips would be shifted into the spring, between March 1 and June 14, or into the winter, between Nov 1 and February 28/29. Since meat weights are highest in spring and summer, this alternative is likely to increase the amount of fishing effort required to catch the trip limits, and thereby increase impacts to EFH as compared to no action. Again, it is difficult to predict the impacts of this measure on EFH because impacts are based on how vessels react to this restriction.

Seasonal closure for Delmarva

These alternatives would consider a seasonal closure of the entire access area to both general category and limited access scallop vessels. The first option under this alternative would close the area during September and October, which is consistent with the range of time the area was closed in 2010 under FW21. The second option would close the area during July, August, September and October, in order to encompass months with high estimated turtle interaction rates within the Delmarva area.

Again, since the total number of Delmarva access trips is fixed, these options would shift fishing effort away from the closure periods (either September and October or July through October) and into the remainder of the fishing year. Given that it overlaps more closely with months when meat yields are highest, the July through October option will have the greatest negative impacts on the scallop resource, catch rates, and thus on EFH. The September and October option will have lesser impacts on scallops and EFH. Again, it is difficult to predict the impacts of this measure on EFH because impacts are based on how vessels react to this restriction.

Seasonal closure in Hudson Canyon for 2012 and 2013 only

These alternatives would consider a seasonal closure of the entire access area to both general category and limited access scallop vessels during fishing years 2012 and 2013. Since Framework 22 will not be implemented before June 2011, the area will continue to be closed to all scallop fishing until that time.

The first option under this alternative would close the area during August and September, the time period when most observed turtle takes occurred balanced with the months when scallop meat weights are lower. The second option would close the area during July, August and September.

Again, since the total number of Hudson Canyon access trips is fixed, these options would shift fishing effort away from the closure periods (either August and September or July through September) and into the remainder of the fishing year. Given that it has greater overlap with months when meat yields are highest, the July through September option will have the greatest negative impacts on the scallop resource, catch rates, and thus on EFH. The August and September option will have lesser impacts on scallops and EFH. Again, it is difficult to predict the impacts of this measure on EFH because impacts are based on how vessels react to this restriction.

5.2.7 Modifications to VMS

As described in Section 2.10, two alternatives were considered: the No Action, which would not change the VMS regulations and Alternative 2.11.2, which would allow a vessel to turn their VMS unit off of it does not intend to land scallops. Neither of these measures is expected to have a direct impact on EFH since it is related to enforcement and not where and how much vessels can fish.

5.2.8 Revisit the Possession Limit of In-Shell Scallops Seaward of the Demarcation Line

Alternative 2.11.2 would reduce the possession limit seaward of the VMS demarcation line from 100 bu to something less (i.e. 65 or 75bu). However, since this alternative was first proposed, Amendment 15 increased the meat weight possession (trip) limit from 400 pounds to 600 pounds. The current 100 bu in-shell possession limit is more closely in line with the new 600 lb trip limit (see biological impacts section for observer data basket weight estimates to support this).

Any measure that reduces the incentive to shell-stock is viewed as having positive impacts on the scallop resource, and presumably on EFH as well, as scallops are not being caught and possibly discarded unnecessarily. Because the new higher trip limit of 600 lb already reduces the incentive to shell stock under a 100 bu in-shell possession limit, both no action and the lower in-shell possession limit proposed by this alternative are expected to have minimal effects on the magnitude of impacts on EFH compared to increasing the possession limit.

5.2.9 Extension of unused Elephant Trunk Access Area trips through May 31, 2011

Alternative 2.12.2 would allow full-time vessels to use any unused FY 2010 ETA trips through May 31, 2011. This extension would only apply to vessels that have one or two fully unused trip(s) at the end of 2010.

It is assumed that this alternative would result in a temporal shift in effort in the ETA from now through March 28, 2011 until the spring of 2011 before May 31. Later in the spring, scallop meat yields are higher, such that the ETA trip limit should be achievable with less fishing effort. If implemented, this alternative has the potential to reduce impacts to EFH if vessel owners choose to delay using their 2010 ETA trips. Similar benefits to EFH may also be realized under the No Action alternative as well if vessels decide to start fishing part of an ETA trip toward the end of the 2010 fishing year and take advantage of the existing 60-day extension into the beginning of the 2011 fishing year, through April 30, 2011. While this is only month before the extension considered (through May 31) catch rates are higher in March and April than during the winter months at the end of the 2010 fishing year (Jan and Feb).

5.2.10 Eliminate schedule of Georges Bank access areas in regulations

Alternative 2.13.2 would eliminate any reference to the two years closed/one year open schedule of access areas on GB. Openings should be based primarily on scallop resource and other factors like YT bycatch available, and not a default schedule that may not match current schedules and biological constraints.

In the past, this automatic schedule for the GB access area openings has resulted in less fishing effort under the no action alternative until the delayed framework is eventually implemented. Thus, implementing this alternative might be expected to decrease EFH impacts because fishing effort and thus area swept decrease. However, since a correcting framework is typically implemented a few months into the fishing year, and the GB access areas do not open until June, there is not likely to be a change in the timing or location of fishing if this alternative is implemented, and thus changes to EFH impacts are not likely.

5.2.11 Summary of Impacts to EFH

As compared to the no action alternative for all measures, the alternatives under consideration are not expected to result in increased impacts of the scallop fishery on EFH. Furthermore, there have been no major changes to the fishery that would substantively alter the conclusions about adverse effects reached during the baseline evaluation of scallop fishery effects on EFH prepared for Amendment 10. Finally, adverse impacts of the scallop fishery on EFH were minimized to the extent practicable via Amendment 10, and will continue to be minimized to the extent practicable once the proposed measures are implemented. Thus, no additional measures to minimize the impacts of the fishery on EFH are required by, or proposed by, this action

5.3 IMPACTS ON PROTECTED RESOURCES

5.3.1 Background

The Framework Adjustment 22 alternatives are evaluated below for their impacts on protected resources with a focus on threatened and endangered sea turtles, as noted in the Affected Environment Section. As with the analyses provided in the last scallop management action, the species considered here are loggerhead, leatherback, Kemp's ridley and green sea turtles.

Both scallop dredge and scallop trawl gear will be addressed in this section, generally collectively, given they are the most commonly used gears by general category and limited access vessels in this fishery. To evaluate impacts it may be helpful to note that the majority of fishing effort is attributed to the dredge fishery. Most of the approximately 340 active limited access vessels use dredge gear. There are approximately 360 limited access general category vessels that are allowed to land 5.5% percent of the total projected scallop landings.

To briefly summarize the sea scallop fishery management program, it employs a limited access permit system and controls DAS use in scallop open areas. Limited numbers of trips with trip limits also are allowed in designated rotational access areas. Major harvest areas include Georges Bank with less activity in the Gulf of Maine. Both are regions in which turtles are far less likely to be found relative to Mid-Atlantic waters, where effort and scallop catch levels have increased in recent years. In addition, directed general category scallop fishing effort has increased overall since 1994, including new effort in the Mid-Atlantic, but this trend is was addressed by measures implemented in Amendment 11 to the Atlantic Sea Scallop Fishery Management Plan that implemented a limited access program for this fleet.

Although scallop fishing is a year-round activity, takes of sea turtles potentially may occur from May through November given the overlap of the sea turtle distribution (Shoop and Kenney 1992; Braun-McNeill and Epperly 2002) and fishery effort (NEFMC 2003, 2005).

Sea turtles are present seasonally in the Mid-Atlantic, moving up the coast from southern wintering areas as water temperatures warm in the spring and returning in the fall (NMFS 2008). Fisheries observers have recorded sea turtle interactions with scallop gear during June – October (Figure 1). While turtle interactions could occur in any month throughout the Mid-Atlantic during this time period, higher probabilities have generally been associated with warm sea water temperatures (>19C) and depths between 50 and 70 m (see Murray 2004a, 2004b, 2005, 2007 for more information on estimated bycatch rates and observer coverage levels).

With respect to sea turtle interactions with the fishery overall, it is noteworthy that there were very low levels of observer coverage throughout the fishery up to 2001 (though observer coverage during 2001 and 2002 was concentrated mainly in the Hudson Canyon Access Area). Since that time, bycatch rates, with a focus on the Mid-Atlantic, have been analyzed in a number of publications that are discussed in the Affected Environment section.

In mid-2006, NMFS finalized a rule (71 FR 50361, August 23, 2006) that required scallop fishermen operating south of 41 9.0' N from May 1 through November 30 each year to equip dredges with chain mats. The intent of the dredge gear modification is to reduce the severity of some turtle interactions that might occur by preventing turtles from entering the dredge bag. Chain mats do not decrease the number of turtles in contact with the gear; rather they decrease the likelihood that turtles will suffer serious injuries. Because chain mats are designed to keep turtles out of the dredge bag, enumerating observed interactions in and around scallop dredge gear became difficult after 2006. The requirement is expected to reduce the severity of some turtle interactions with scallop dredge gear. For the years the Elephant Trunk access area was open to the fishery, 2007-2010, there has also been a seasonal closure from September 1-October 31 to reduce impacts on sea turtles. Under this action that area will revert back to an open area.

With respect to Framework Adjustment 22, several rotational fishing areas are considered: Nantucket Lightship Closed Area (NLCA), the Delmarva Area (DMV), the Hudson Canyon Area, and a potentially new access area in the Great South Channel off Cape Cod. Measures primarily serve to set 2011 and 2012 access levels to these areas and change levels of fishing effort in the areas outside of these rotational areas. There are specific alternatives in this action designed to comply with the 2008 biological opinion of this fishery related to impacts on sea turtles.

Discussions regarding sea turtle interactions with the fishery are largely qualitative and based on factors such as projected DAS use-by-area and projected bottom area swept (Section 5.3.8.1.3). It is important to recognize that neither factor directly relates to the frequency of turtle bycatch in the fishery, but provide some measure of how much effort is projected to occur and which areas might be subject to more or less activity based on catch rates. Although it is not repeated in each alternative, the general assumption is made that turtles interactions occur when and where scallop fishing effort overlaps with the presence of sea turtles. Risks may be greater during turtle high use periods, but interactions could still occur in the margins of that period given that both turtle distribution and fishing activities are highly variable.

The analyses for the alternatives to comply with the RPM are also qualitatively in terms of direct impacts on sea turtles; however, some quantitative information has been included based on a model developed for estimating turtle takes in the scallop fishery by month and area (Murray, 2011: Appendix II). The same monthly turtle take rates from this study were used by the PDT to estimate the potential effects of the RPMs based on the number of estimated takes, or percent reduction in takes from a particular RPM (Section 5.3.8.1.3). In addition, the approaches used to determine if the measures are expected to have a more than a minor impact on the fishery are quantitative. The Scallop PDT used a similar approach for assessing what constitutes a more than minor impact on the fishery as it did last year in Framework 21. The methods and results of the more than minor impact analyses are presented first below in Section 5.3.8.1.1, and are followed by an evaluation of the impacts of all FW22 alternatives on protected resources, namely sea turtles (Section 5.3.8.1.3).

5.3.2 Acceptable Biological Catch

This alternative sets Acceptable Biological Catch (ABC) values for 2011-2013 (with the assumption that a subsequent framework action will update the 2013 values in advance of that fishing year). ABC is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan. Acceptable Biological Catch for the scallop fishery is 69.0 million lbs. in 2011 and 73.3 million lbs. in 2012. Reduced for discard and incidental catch mortality, the ABC available to the fishery is 60.1 million lbs. for 2011 and 63.8 million lbs. for 2012.

For comparison, the No Action ABC and the 2010 ABC was set at 65.2 million pounds, including an estimated 7.4 million pounds for non-yield fishing mortality (discards and incidental mortality). Therefore, the overall No Action ABC for the fishery, excluding discards and incidental mortality is 57.8 million pounds, which is equal to the ABC during 2010.

Any impacts associated with these ABC values on protected resources are rolled into the discussion of the allocation alternatives (section 5.3.3), because given similar ABC values available to the fishery each year, impacts on bottom contact time (proxy for impacts on protected resources) will vary according to the timing and spatial distribution of catches, both of which are accounted for in the modeling work done to evaluate the allocation alternatives.

5.3.3 Fishery specification alternatives

All FW22 alternatives have lower total bottom contact time compared to 2010 estimates of 5,000 square nautical miles. In particular, Alternative 1 has the lowest estimate of bottom time for 2011 and 2012, below 3,000 square nautical miles for the entire fishery. These overall reduced levels of bottom contact time are expected to have beneficial impacts for sea turtles compared to No Action and recent years with higher estimates of bottom contact time.

Impacts of No Action allocations on protected resources could be higher than alternatives under consideration because fishing levels would be higher in ETA where catch rates are very low and more DAS are allocated under the No Action alternative that could be fished in the Mid-Atlantic during the time of year when turtles are present. All new alternatives include only 2 trips in the Mid-Atlantic compared to 3 under No Action, so all other alternatives considered are expected to benefit turtles compared to the No Action allocation alternative since less access area effort will take place in 2011 and 2012 compared to 2010, and less open area DAS are allocated.

Regarding Alternative 3, additional rotational areas could reduce the potential negative impacts of scallop gear interactions with threatened and endangered sea turtles if they allow for decreased effort and bottom contact time relative to No Action in areas and at times when fishery encounters are most likely to occur. In this case, however, DAS used and bottom area swept is greater under the Channel closure option than the other alternatives. Because of these increases, correspondingly greater risks to turtles may result if effort overlaps with the presence of sea turtles. Further, closing the Great South Channel area is not likely to confer benefits to turtles because of their general scarcity in the area and because effort could potentially shift to the Mid-

Atlantic where sea turtles have a higher risk of entanglement. Leaving the Channel area open under any of the alternatives is less risky relative to sea turtles.

It should be noted that this action is also considering specific measures to limit effort in the Mid-Atlantic to comply with a recent biological opinion of this fishery and its impacts on sea turtles. Therefore, if certain measures are selected under that section the combined potential impact on turtles of closing the Channel may be reduced if other actions are taken to limit scallop effort in the Mid-Atlantic during the time of year turtles are present.

5.3.4 Summary of additional measures specific to limited access vessels

This framework includes the specific access area schedule and DAS allocations for all limited access scallop vessels. The impacts of these various alternatives on protected resources, including the No Action alternative, are summarized in Section 5.3.3. From the selected allocation alternative a specific DAS compensation value is calculated for open area DAS if a GB access area closes early due to the YT TAC being reached.

Table 16 describes the DAS compensation amounts for each area if the YT bycatch TAC is reached. It is possible that some of this effort from access areas on GB could be used in open areas in the Mid-Atlantic during the turtle season, but it is not expected to be a substantial amount of effort; therefore, potential impacts on protected resources are minimal and limited.

5.3.5 Measures for General category vessels

This section includes the fleetwide max trip allocations for LAGC vessels by area. General Category vessels do not have to take these trips, but it is a fleetwide max. Compared to 2010, total trips allocated in Mid-Atlantic access areas are fewer in both 2011 and 2012. General category fishing overall is a small percentage of total effort in the scallop fishery and it is under IFQ management now so total effort from this fishery is limited. Therefore, impacts on protected resources are expected to be minimal from these allocations, as well as the No Action allocations.

5.3.6 NGOM and Incidental catch TAC

Neither Alternative in Section 2.6.3 is expected to have impacts on protected resources since the Gulf of Maine is not a primary location where sea turtles are found. In addition, the alternative to maintain the incidental catch target TAC at 50,000 pounds is not expected to have direct impacts on protected resources; this is a minor component of the fishery.

5.3.7 TAC set-asides for research and observers

Indirect benefits for protected resources if set-asides help increase understanding of impacts from interactions with the scallop fishery. Modifications made to the priorities related to protected resources expected to have beneficial impacts on protected resources by increasing understanding of how sea turtles interact with the scallop fishery. It should be noted that the total amount of catch available for research is greater than it has been historically, so there may be indirect benefits to protected resources if more catch is available to fund projects related to protected resources.

5.3.8 Alternatives to minimize impacts of incidental take of sea turtles as per the 2008 scallop biological opinion

5.3.8.1 Analyses used to develop specific reasonable and prudent measures

5.3.8.1.1 More than minor threshold

There is no official guidance on how to define more than a minor change. However, based on ESA regulations, a reasonable and prudent measure, along with the term and condition that implement it, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes. But, how to define a minor change is not specified. After the biological opinion on the scallop fishery came out in 2008 the Scallop Committee requested that the PDT provide an analysis that would help identify what is more than a minor change in the scallop fishery.

The scallop fishery is managed under an adaptive rotational management plan. A substantial portion of total fishing effort is allocated into specific areas to maximize yield. Outside constraints on how effort is allocated and used over time or space can have impacts on the overall effectiveness of the program and fishing mortality. **Therefore, the PDT recommends that the threshold for more than a minor change should be based on an amount of "effort shift" imposed by the RPM and Term and Condition.** Spatial and/or temporal shifts in effort can increase overall fishing mortality, and depending on the nature and extent of the effort shift imposed by the RPM, more than minor changes can result if fishing mortality increases causing noticeable changes in yield, landings and revenue.

In terms of this biological opinion, the premise is to limit scallop fishing effort during the time of year and area where the overlap of turtles and scallop fishing activity is most likely to occur. Under area rotation, fishing effort is allocated in certain areas when yield is expected to be higher, and shifting that effort to other times and areas can reduce landings per unit of effort, and thus can have impacts on EFH, bycatch, revenue loss etc, and most importantly for this purpose, will increase fishing mortality. In both the short and long term, increases in fishing mortality that are more than a small amount will cause more than a minor change in the fishery.

Based on scallop meat weight analysis by month, it is shown that there are seasonal effects on relative fishing mortality (See Framework 21 Appendix I for more information). In general, the highest meat weights in the Mid-Atlantic are from April through August. About 40% of all fishing in Mid-Atlantic access areas and open areas has occurred between the months of June-October. If effort is limited during that period to reduce impacts on turtles, then that effort will be displaced to the other months of the year when meat weights differ (either higher or lower). Depending on the season and amount of effort that is displaced, the change in yield is expected to vary by 5-10% based on changes in average meat weights by month.

The PDT developed a model that estimates changes in fishing mortality, effort shift and impacts on revenue when limitations are placed on the scallop fishery by season and/or area. This model was first developed to assess whether the original term and condition was reasonable and prudent (more than a minor change), but it has also been used more recently to asses whether the alternatives to comply with the revised RPM developed in Framework 22 are expected to have more than a minor change on the scallop fishery. The differences in fishing mortality, yield, and revenue impacts can be compared.

In addition to the primary threshold for more than minor (percent change in effort shift), the PDT included a description of other factors that should also be considered when identifying a more than minor change that would also be affected by a shift of effort including: concern about safety at sea (shift to winter months), changes in bycatch (i.e. fluke bycatch increases in winter months because it overlaps with the scallop fishery offshore), revenue impacts because of reduced catch and changes in price, costs, markets, supply, etc., impacts on ability of observer program to maintain coverage from surges and shifts in effort, and general impacts of altering rotational area management and compromising the ability to achieve optimum yield.

A model was developed to estimate changes in fishing mortality, effort shift and impacts on revenue when limitations are placed on the scallop fishery by season and/or area. It includes several important assumptions that are described in detail in Section 5.3.2 of FW21. Some of those assumptions have been updated or adjusted for analyses in this action, and those are described in Section 5.3.8.1.2. Assumptions include: seasonal and spatial composition of both open area and access area effort, effort displacement of 100%, and shifts in scallop meat weights by season. Some of these assumptions were updated with more recent data and some were the same used as last year.

When the PDT originally developed the model to determine the threshold for more than minor, the model included an analysis with a threshold of effort shift and change in fishing mortality (F) of 0.01 as a possible threshold for more than a minor change. An increase in fishing mortality of 0.01 is equivalent to a 12% effort shift multiplied by the assumed 8% loss of yield when effort is shifted from June-Oct to Nov-May (0.12*0.08 = 0.0096). A threshold could be set anywhere, but last year the PDT identified 0.01 because it is 5% of the current fishing mortality target. This threshold is what was recommended for the specific time period and associated meat weight changes from the biological opinion last year (June1-Oct 31 and an estimated loss of 8% yield shifting effort from that period to the remaining months of the year).

It is important to note that in this Framework there are several different seasons under consideration which are different than the seasons considered in FW21, and each have a different meat weight change. So the same 0.01 change in *F* threshold that was used in FW21, cannot apply to all seasons considered in this action because the season alternatives are different. Therefore, for this framework having the same overall value of change in F is not useful since the time periods and measures under consideration are very different. Evaluating the differences in F is informative, but similar to the process last year, the more useful parameter to consider is the amount of effort shifting from the Mid-Atlantic during the turtle season to the remainder of the year and what the expected impacts on catch and revenue are from that shift. Percent effort shift is actually the factor the PDT identified originally as what should be the threshold for more than a minor change. Ultimately, identifying what is more than minor is a policy decision, but ESA stipulates that, “a reasonable and prudent measure, along with the term and condition that implement it, cannot alter the basic design, location, scope, duration, or timing of the action and may involve only minor changes.

Ultimately, when the Scallop Oversight Committee considered all this related to the original biological opinion in 2008 the Committee decided that identifying a precise threshold for more than minor is not preferred; instead, during development of FW21 and FW22, the PDT should evaluate what limit on effort will not result in more than a minor impact on fishing mortality or the fishery using updated information and considering all the issues described above such as concern about safety at sea, changes in bycatch, revenue impacts because of reduced catch and changes in price, costs, markets, supply, etc., impacts on ability of observer program to maintain coverage from surges and shifts in effort, and general impacts of altering rotational area management and compromising the ability to achieve optimum yield.

The next section assesses the RPM alternatives currently in FW22 compared to status quo. A summary of potential impacts of each RPM is assessed separately. **Again, there is no threshold set in stone, but the PDT presented and the Committee agreed that a measure that causes more than 10% of effort to shift from the Mid-Atlantic during the various turtle seasons under consideration would be a reasonable threshold for more than a minor change.**

The Committee supported 10% to be used in this action because these analyses are based on assumed fishing behavior responses and historical fishing patterns, so impacts could be very different if the fishery responds differently than assumed. Specifically, if effort shifts mostly to November and December, then impacts on *F* will actually be higher than the results suggest. If effort shifts only to the summer when meat weights are higher impacts on *F* will be reduced, thus overall impacts from the measure may be lower or even positive in some cases. Ultimately, the Committee voiced that 10% seems to be a reasonable level of effort shift to use as a standard since actual impacts could be higher or lower.

However, when the Committee reviewed impacts of measures with higher amounts of effort shift the associated impacts on landings and revenue were higher. Additional issues were identified with these measures making them unreasonable or having more than minor impacts because they are expected to have high distributional impacts on the fleet; some will be impacted greatly and others not at all. Ultimately, since these impacts are difficult to predict because they are based on changes in fishing behavior and issues not in the model such as changes in price, and other unknowns, implementing something that could have the potential to have much higher impacts on *F* due to effort shifting into seasons with lower meat weight yields is risky and could have more than minor impacts on *F* and the fishery. Finally, the Committee voiced that shifting 10% of effort from that area and season is a considerable amount of total effort so even if that percentage is not precise because it is based on numerous assumptions, it does represent a probable amount of effort being shifted, which should have beneficial impacts on turtles even if it cannot be quantified precisely.

5.3.8.1.2 Summary of assumptions

The model developed by the PDT estimates changes in fishing mortality, effort shift and impacts on landings, revenue and costs when limitations are placed on the scallop fishery by season and/or area. It includes several important assumptions that are described below.

It should also be pointed out that for the purposes of quantifying the impacts of the new RPM measures under consideration in FW22; No Action is considered to be no RPM. No specific measures would be implemented to limit fishing in the Mid-Atlantic to reduce impacts on sea turtles. No Action for FW22 is technically that 2010 RPM measures would roll over since the regulations do not have an end date, as described in Section 2.9.1.1. However, for the purposes of quantifying the impacts of new RPMs they need to be compared to no RPM. Since allocations vary each year and some of these areas are no longer access areas (Elephant Trunk) the impacts of the RPM alternatives in FW22 have been compared to no RPM in order to determine if the fishery would experience more than minor impacts. The threshold for what more than minor is varies based on what the fishery is allocated; there is no “baseline”. For the purposes of establishing whether new restrictions would have a more than minor impact on the fishery, they could not be compared to 2010 RPMs as the No Action, since the fishery allocations for 2010 are now obsolete. Since Elephant Trunk is not an access area, fewer open area DAS are allocated under FW22 and fewer Mid-Atlantic access area trips are allocated, the new RPMs need to be evaluated with that set of allocations, not 2010 allocations.

The seasonal composition of open and access area effort

Updated analyses have been completed for various season alternatives in FW22 based on monthly dealer data from 2004-2009 fishing years. It is assumed that distribution of effort follows a pattern similar to distribution of landings. Percentage distribution of fishing effort in five different RPM windows that were considered in this Framework is estimated in Table 69 by area. The model assumes that effort will be distributed by these percentages in 2011-2012 as well in the absence of RPM measures. For example, it is estimated that 14% of the total Mid-Atlantic open area effort takes from September to October and this percentage is used to estimate total open area DAS for the proposed action.

Table 69. Percentage distribution of landings during alternative RPM windows (based on the 2004-2009 dealer data)

RPM WINDOW		% of effort in GB	% of effort in MA
SEPT - OCT	OPEN	20%	14%
	ACCESS	13%	13%
NOV-AUG	OPEN	80%	86%
	ACCESS	87%	87%
JULY - OCT	OPEN	47%	28%
	ACCESS	66%	34%
NOV-JUN	OPEN	53%	72%
	ACCESS	34%	66%
JULY-SEPT	OPEN	39%	21%
	ACCESS	63%	28%
OCT-JUNE	OPEN	61%	79%
	ACCESS	37%	72%
AUG-SEPT	OPEN	27%	14%
	ACCESS	39%	16%
OCT-JULY	OPEN	73%	86%
	ACCESS	61%	84%
JUN15-OCT31	OPEN	55%	34%
	ACCESS	75%	40%
NOV-JUN 14	OPEN	45%	66%
	ACCESS	25%	60%

Because two separate access areas, Delmarva (DMV) and Hudson Canyon (HC) were considered for closure in Mid-Atlantic, distribution of effort during various seasons were estimated for each area individually in Table 73. These percentages are used to estimate total number of access area trips during these windows for the proposed action.

Table 70. Percentage distribution of landings in DMV and HC areas in various RPM windows (based on the 2004-2009 dealer data)

RPM WINDOW	% of effort in DMV	% of effort in HC
SEPT - OCT	24.60%	10.50%
NOV-AUG	75.40%	89.50%
JULY - OCT	38.30%	33.50%
NOV-JUN	61.70%	66.50%
JULY-SEPT	22.40%	28.20%
OCT-JUNE	77.60%	71.80%
AUG-SEPT	16.30%	15.00%
OCT-JULY	83.70%	85.00%
JUN15-OCT31	42.00%	44.00%
NOV-JUN 14	58.00%	56.00%

Finally, updated analyses suggest that 47% of total open area effort was used on Georges Bank and 53% in Mid-Atlantic open areas. These percentages are based on the mean of landings from

2006-2009. Landings from 2004-2005 were not included in the estimate because recruitment has improved on GB in recent years, so catch in that area is expected to increase compared to the Mid-Atlantic, which is experiencing lower recruitment.

Effort displacement for open areas and access areas

It is assumed that if open area DAS in the Mid-Atlantic are limited by some amount, all vessels will use their remaining DAS at other times or in the GB open areas. The current estimate of open area DAS for the proposed action is 32 days in 2011 and 34 days in 2012.

In 2011-2012, it is estimated that full-time vessels will be allocated 2 access area trips in the Mid-Atlantic (1 each in DMV and HC in 2011 and 1.5 trips in DMV and 0.5 trip in HC in 2012). Since these pounds cannot be landed from other areas, it is highly likely that the vessels will attempt to take their access area trips during months when the areas are open to fishing, outside the specific RPM window. So this model assumes that 100% of access area trips will be taken outside of each specific window.

Changes in meat weight by season

Shifting effort from one season to another will affect catch and fishing mortality due to changes in seasonal meat weights. More information about the effects of sea scallop management on meat-weight yields in Mid-Atlantic was provided in Section 5.3.2.1.2 of Framework 21. Some months will have higher losses and some lower depending on the length of the closure and when effort is displaced. The impacts of this loss on landings, fishing mortality and revenues would vary with the FW22 management alternatives and the RPM season.

The estimated change in meat weight from one season to another has been calculated for the various time periods under consideration in FW22 RPM alternatives using new projections of LPUE by area (Table 71). The meat weight anomalies were calculated using the survey meat weights as a baseline (Table 72). In open areas, the average commercial meat weight is 6.8% below that of the survey, however, while in access areas, the survey meat weight are about the same as the meat commercial meat weight. Therefore, for the open areas, meat weight anomalies shown in Table 72 include a 6.8% adjustment for the difference in the survey and commercial meat weights. The difference between the meat anomalies is used to estimate the percentage change in meat weights when effort is moved from one season to another and to adjust the respective LPUE's for each area and RPM window.

Table 71– LPUE (pound per DAS-used) by area for the proposed action

Area	LPUE
GB OPEN	2491
MA OPEN	2406
GB ACCESS	3278
MA ACCESS	2629

Table 72– Scallop meat weight conversions for shifting effort from one season to another

RPM WINDOW		Meat weight anomalies
SEPT - OCT	OPEN	-0.062
	ACCESS	-0.038
NOV-AUG	OPEN	0.007
	ACCESS	0.028
JULY - OCT	OPEN	0.001
	ACCESS	0.015
NOV-JUN	OPEN	0.000
	ACCESS	-0.003
JULY-SEPT	OPEN	0.028
	ACCESS	0.036
OCT-JUNE	OPEN	-0.008
	ACCESS	-0.007
AUG-SEPT	OPEN	0.012
	ACCESS	0.013
OCT-JULY	OPEN	-0.002
	ACCESS	0.000
JUN15-OCT31	OPEN	0.039
	ACCESS	0.048
NOV-JUN 14	OPEN	-0.008
	ACCESS	-0.007

In summary, the model estimates the expected effort by season based on historical trends, and evaluates what the impacts are from various constraints put on the fishery from the different RPM alternatives. The DAS and access area allocations for the proposed action (Alternative 1) are inputs into the model. Based on these inputs and assumptions, the model is used to analyze the changes in fishing mortality, effort shift and impacts on landings, revenue and costs when limitations are placed on the scallop fishery by season and/or area.

5.3.8.1.3 Results

Row 2 to 24 in Table 73 and Table 75 shows the results of each RPM option for specific the window shown in each column. Projected number of trips in each area was calculated in Row 2 by multiplying total access area trips estimated for the proposed action with the percentage of effort in a specific RPM season based on the numbers shown in Table 69 and Table 70. For example, the full-time vessels would be allocated 2 access area trips in Mid-Atlantic (DMV and HC) in 2011. In order to estimate total number of trips, it was estimated that about 345 FT equivalent vessels will participate in the fishery including the part-time and limited access general category vessels. Thus total Mid-Atlantic access area trips totals would be about 690 trips (345 trips in each area in 2011). Table 70 shows that 24.6% of the DMV trips take place in Sept - Oct, and 10.5% of the HC trips take place in the same months. Therefore, total number of DMV and HC trips would be 121 (345*24.6%+345*10.5%) in Sep-Oct in 2011 (Table 73). Row 3 shows that if DMV was closed during Sept - Oct, total number of trips would consist of HC trips only (i.e., 36 trips=345 trips*10.5%). The number of trips with and without the closures is estimated in the same way for the other RPM alternatives in Table 73 and Table 75. Row 4 shows the decline in number of trips for each RPM alternative.

Total landings in the MA access areas were estimated without closure (Row 5: PRE RPM) and with closure (Row 6: POST RPM) by multiplying the number of trips in Row 2 (PRE) and row 3 (POST) with possession limit, i.e., by 18,000 lb. Row 7 shows the decline in landings in this specific window with the closure.

Projected DAS used without closure (Row 8: PRE RPM) and with closure (Row 9: POST RPM) are calculated by dividing total landings with the LPUE for each area in the particular window. Row 10 shows the total decline and Row 11 shows the percentage decline in total DAS used in the Mid-Atlantic access areas due to the closure.

Row 12 estimates the total DAS-used in all areas during each specific RPM window and Row 13 shows the decline in DAS-used as a percentage of total DAS-used in all areas in the same RPM window.

Change in meat weight for each RPM window is shown in Row 14. It estimated using the meat anomalies shown in Table 72 above. For example, meat weight in Sept - Oct would be 6.6% lower than outside of this window (-0.038 – 0.028= 0.066, or by 6.6%), thus removing effort from this window could benefit the fishermen. Percentage change in F in Row-15 was calculated by weighting the change in meat weight with the percentage shift in effort shown in Row 13 (-6.6%*18.3%=-1.2%). That is, DMV closure during Sept - Oct could lead to about 1.2% decrease in F.

Change in fishing costs in row 16 is estimated by multiplying change in DAS used (Row 10) with the estimated fishing costs per DAS ($1,600). Because it was assumed that the effort removed from a specific RPM window will be taken in the remainder of the year (i.e., 100% effort displacement), and the same number of trips will be taken at the same possession limit in the access areas there will be no change in landings with the access area closures during various windows (row 17). Reducing the open area DAS in a more productive window (higher LPUE) will reduce landings, however, since the remaining DAS allocations will be used when the meat weights are relatively lower (such as alternative D in Table 73). Change in revenue is estimated (Row 18) from the estimated prices for the proposed action for each year and the change in landings shown in Row-17.

The row 19 estimated the % shift assuming that all effort removed from a specific window shifted to out of turtle season (June 15 – Oct 31st). Gray shaded area (rows 20-24) represents the shift out of the Turtle season (June 15 – Oct 31st) assuming that part of the effort that is removed from a particular RPM window could shift to the other months in the entire turtle season from June 15 to Oct31. These assumptions with the effort shifts are explained below for each RPM option.

5.3.8.1.3.1 RPM Options for Alt1: 2011

Table 73. RPM options for year 2011 for allocation alternative 1 (Alt1)

Row #	2011	DMV Closure Sept - Oct	DMV Closure July - Oct	1 trip max. in MA June15 - Oct 31 (or combination with DMV closure)	Reduce open MA DAS July-Sept.
1	Column	**A**	**B**	**C**	D
2	Projected # of trips in window PRE RPM TW	121	248	295	3.7
3	Projected # of trips in window POST RPM TW	36	116	186	1.1
4	Difference in # of trips in MA AA during window	85	132	109	-2.6
5	Total landings in MA AA in window PRE RPM	2,183,527	4,456,687	5,312,530	3,144,881
6	Total landings in MA AA in window POST RPM	653,947	2,080,049	3,342,467	943,464
7	Difference in landings in MA AA during window (negative)	(1,529,580)	(2,376,639)	(1,970,063)	(2,201,417)
8	Projected DAS used in MA AA during win. PRE RPM	863	1618	1987	1271
9	Projected DAS used in MA AA during win. POST RPM	258	755	1250	381
10	Difference in projected DAS used in MA AA during win.	-605	-863	-737	-890
11	% reduction in MA AA effort during window	-70%	-53%	-37%	-70%
12	Total effort during window (DAS-used in MA+GB)	3310	8404	9922	7063
13	Total effort shift in MA (AA +OA) during window	18.3%	10.3%	7.4%	12.6%
14	Change in MW in window	-6.6%	5.5%	2.2%	3.7%
15	% Change in F	-1.2%	0.562%	0.167%	0.461%
16	Change in fishing costs	-61,755	76,045	26,583	0
17	Change in landings	0	0	0	(78,422)
18	Change in revenue	Positive	Uncertain	Uncertain	(598,822)
19	% shift of from June 15-Oct31 window assuming all effort shifts out of this season	-6.1%	-8.7%	-7.4%	-9%
20	% shift of removed effort to June 15 - Oct31st	67%	15%	0%	10%
21	Number of trips shifts to June15-Oct31	57	20	0	NA
22	Shift of effort (DAS) to June 15 - Oct31st	-405	-129	0	-89
23	**Net shift off effort from June 15-Oct31**	**-200**	**-733**	**-737**	**-801**
24	**B. % Net shift of effort**	-2.0%	-7.4%	-7.4%	-8.1%

DMV closure from September to October: This alternative would remove about 85 trips, or 605 DAS-used (Row 10-column A), from these months, which is equivalent to a shift of 18.3% (row 13 – column A) of effort from Sept - Oct However, 605 days represents a shift of 6.1% from the total turtle season assuming that none of these 605 days are shifted to June 15-Aug.31st (605 DAS-used / 9922 DAS-used (row 10– column A / row 12– column C). This is obviously an unrealistic assumption representing the upper limit for effort shift:

- Since this DMV closure window is shorter and included in the overall turtle season (June 15 – Oct 31st), some part of the effort is likely to shift outside of that window to the remaining months of the season.
- For example, closure of DMV during Sept and Oct is estimated to remove 85 trips (Row 4-Column A) or 605 DAS-used (Row 10) from these months. According to the preliminary data for 2010 considering the Sept-Oct DMV closure under FW21, 67% of the effort normally taken during Sept and Oct was shifted to June to August. If the same % shift was applied, 57 of the 85 trips, or 405 out of 605 of days, removed from Sept to Oct would shift to the Turtle season (row 22 of column A).
- Thus, the net change in effort during the overall window would 28 less trips in Sept and Oct, or a 200 less days used (Row 23 = Row 10- Row 22). This would correspond to a 2% shift in effort to outside of the turtle season with limited benefits for the turtles (row 23 of Column A/row 12 of Column C).
- Because the meat-weights are lower in September-October compared to the rest of the year, closing DMV could have positive impacts on the yield and could benefit fishermen if they receive higher prices for the larger scallops outside of this window.
- Fishing outside of this window would also lower the fishing costs because the higher meat weights could result in shorter fishing time. If all the effort removed from this window was used outside of the turtle window distributed somewhat evenly during those 7.5 months (Nov 1 - June 14), estimated fishing costs would decline by about $61,755 for the fishery as a whole.
- However, some fishermen may prefer to fish during these months if they think they can get a better price when the supply is relatively lower. For example, both the average price and the price of U10 scallops were higher in September and October of 2009 compared to the summer months and some fishermen probably increased their revenue by fishing during this window (Table 73). Therefore, although the impacts of this alternative on the scallop fishery are expected to be somewhat positive, these impacts will probably be small. In addition, late opening of the HC area in 2011 could encourage fishermen to take most of their DMV trips before July and reserve months of September and October for the HC trips, further reducing any impacts this closure may have.

DMV closure from July to October:
Without any effort shifts into the period from June 15 - July 1st, a 4-month closure of DMV from July to the end of October could remove about 132 out of 144 trips expected during this window. This would constitute an 8.7% shift in effort from the entire turtle window to the remaining months of the year with positive effects on turtles.

- Similar to a 2 month DMV closure, however, it is reasonable to expect that some effort removed from this would be directed to the last two weeks of June, reducing the benefits of this closure depending on the extent of the shift. In 2010, Sept - Oct closure of DMV resulted in 15% of the trips removed form these two months to move to June 15 - July 1st window. With a longer closure from July to October, it is possible for more than 15% effort to shift to June 15 - July window, however. Using the lower estimate of 15% as an example, a four month closure of DMV could result in about 20 of these trips to shift to June 15 – July 1st, with a net reduction 112 trips from the entire window. This reduction corresponds to net effort reduction of 733 days (Row 23 Column B) and a 7.4% (row 24, Column B) effort shift out of the entire Turtle season, which is similar in magnitude to the effort shift with the “maximum 1-trip” alternative, estimated to remove 109 trips and about 737 days from the turtle season.

- If more than 15% of the effort removed from the July - October window was shifted to June 15-July, then the benefits of the 4-month closure alternative on turtles would decline. For example, if 25% of the 132 trips removed from this window were shifted to the last two weeks of June, the net decline would be 99 DMV trips (132- 33). This would constitute a 6.5% shift in effort from the entire turtle season, which is less than the shift in effort with the maximum trip alternative.
- Furthermore, the 4 month DMV closure alternative would have the largest impact on overall fishing mortality. It is estimate to increase F by 0.56% if there was no shift in effort and by 0.40% (equal to 7.4%*5.5%) if 15% of the effort removed shifted to June 15 - July window.
- In terms of impacts on the fishery, time-area closures tend to increase costs and lower fishing profits by reducing the flexibility for the vessels to optimize their incomes by choosing where and when to fish in response to the resource and market conditions. If all the effort removed from this window was used outside of the turtle window distributed somewhat evenly during these 7.5 months (Nov - June 14), the fishing costs are estimated to increase by about $76,045 for the fishery as a whole.
- Although the impacts of this alternative on the scallop fishery are expected to be somewhat negative, these impacts will probably be small. Closing this area coupled with the possibly delayed opening of the HC area in 2011 will probably encourage fisherman to take most of their DMV trips before July and reserve months from July to October for the HC trips, reducing the negative impacts from this closure to some extent.

Maximum one-trip alternative:

- This alternative encompasses the entire turtle season (June 15 – Oct 31st). It is estimated that 295 trips, 151 in HC and 144 in DMV, would be taken during this window in the HC and DMV areas.
- The decline in the number of trips when no more than one trip is allowed to take place during the turtle season is estimated using same approach and the data for 2007-2008 provided in Table 68 of Framework 21. This Table is replicated below by restricting the total number of access area trips in Mid-Atlantic to 2 per vessel in accordance with the proposed action (Table 74). The average for the 2007-2008 shows that out of the 240 trips, 151 trips correspond to single trips taken by 151 vessels during this period. The rest of the 89 trips are estimated to be taken as a second trip by a subset of vessels that took at least one trip during the same window. Therefore, if the maximum number of trips per vessel was limited to one during this window, the total number of trips would decline by 89 trips, or by 37% as an average of 2007-2008. When the projected 295 trips for the June 15 to October 31 window are lowered by 37%, the total number of trips is estimated to decline by 109 trips and by 737 days. In other words, total number of trips in MA access areas (DMV+HC) would decline from 295 trips to 186 trips. This reduction

corresponds to a 7.4% shift of effort from the turtle season to the period November 1 to June 14.

Table 74. Estimation of number of trips with constraints on maximum trip per vessel during the turtle window (June 15 to October 31st) and assuming 2 access area trip allocations per vessel (Based on info in Table 68 of Framework 21, DAS data)

Data	2007		2008		2007- 2008 average
	Number of vessels	Number of trips	Number of vessels	Number of trips	
Number of trips per vessel					
0	285	0	87	0	
1	25	25	99	99	
2	21	42	157	314	
Total number of vessels	331	67	343	413	337
Total number of trips		67		413	240
Number of trips if maximum trip=1		46		256	151
Decline in trips if maximum trip=1		29		252	89
Decline in trips if maximum trip =1					37%

- Because the meat weight is about 2.2% higher during this season compared to rest of the year, this alternative would increase fishing mortality slightly by 0.167% and the fishing costs by a small amount ($26,583 for the entire scallop fishery), less than compared with the July - Oct DMV closure alternative.
- Without any closures, it is possible that some fishermen will take less DMV and some will take less HC trips during this season. The delay in HC opening in 2011 will probably encourage fisherman to take most of their DMV trips before July and reserve the summer months for the HC trips. For example, vessels could choose to take all of their HC trips (151 trips) and only 35 DMV trips (out of 144 trips estimated – a decline 109 trips)) during these months. Therefore, this alternative could lead to larger reduction in DMV effort than closing DMV alone in Sept - Oct window, or a similar reduction in DMV effort than closing DMV alone in Jul - Oct window (reduction in DMV effort by 109 trips with maximum trip alternative versus reduction in DMV effort by 99 to 112 trips with 4-month DMV closure assuming respectively 25% and 15% shift of effort).
- The "maximum one-trip" alternative has lower risks for the turtles compared to a DMV closure; because with the restriction on trips, the effort could not be shifted to the other months during the Turtle season.
- Maximum "1-trip" alternative without a DMV closure would provide more flexibility to fishermen, however, in terms of when and where (HC or DMV) to fish depending on the changes in market and resource conditions. As a result, the impacts of this alternative on costs and profits are expected to be lower than a 4-month closure of DMV.
- It is important to note that the analyses of the 1 trip max alternative assume no trading of trips. The number of vessels expected to take one or two trips during the turtle season is based on historical trends of effort in ETA in 2007 and 2008 using Table 68 of the Framework 21 document. The percent of vessels that took one or multiple trips during the season were used to predict the amount of effort that would be shifted due to a one trip

max restriction. This calculation indicated that the number of trips during the Turtle season could decline by about 37% if the number of trips is restricted at one trip per vessel. In 2011 and 2012 some vessels will receive only one MA trip, two or even three depending on the results of the lottery. In addition, some vessels may trade in additional MA trips, so impacts could actually be higher for those vessels if a one trip max is selected reducing the amount of time those trips can be taken during the year.

Combination of maximum one-trip alternative with DMV closures:

- Maximum one trip alternative would reduce the number of estimated trips from 295 to 186 during the entire turtle season assuming that there will be no trading of GB access trips for Mid-Atlantic trips. If DMV was closed in September to October, 85 trips would be removed from that window and some of these trips could be shifted to either June 15-August 31st or to the outside of turtle window.
- If all of these trips were shifted to Nov-June 14 window, this means that the vessels could take 151 HC trips during the turtle season, which is in accordance with the previous seasonal activity in that area. In addition to these trips, the vessels could take about 36 trips in DMV during the June 15-August window, which is less than the number of trips (57 trips =Row 21 of Column A) expected to shift if DMV was closed in September to October without any limits on the maximum number of trips. Therefore, the combination alternative would limit the number of DMV trips that can be shifted from the September-October window. If, however, the vessels would choose to shift 57 DMV trips from the September-October window to June 15-August window, that means they will take less HC trips (129) during the entire window. Therefore, the total number of trips are not expected to exceed 186 trips when number of trips were limited to one-trip during the turtle season, total effort removed from the turtle season (737 days) with the combination alternative is equivalent to the total effort removed by the maximum one-trip alternative without any DMV closure. Both the combination and the maximum one trip alternative would result in a 7.4% effort shift from the turtle window.

The only difference is that combination alternative would limit DMV effort to the June 15-August window, and there would be fewer DMV trips during the entire turtle season. Given that turtle takes are higher in DMV during Sept - Oct relative to the other months and areas, excluding July, the combination alternative may have higher benefits to turtles compared to maximum one-trip alternative alone (Table 81). In addition,

- Table 82 shows that the DVM closure alone may have an average percent reduction in takes of 27% compared to 35% for the combined DMV and 1-trip max alternative.
- The impacts of the combination alterative with a two month DMV closure are expected to be uncertain and small on the scallop fishery. As indicated above, closing DMV and shifting some of the trips out of Sep-Oct would lower the fishing costs because the higher meat weights could result in shorter fishing time. The fishing mortality rate could slightly decline as well for the same reasons. However, pushing some DMV trips to the June 15-August window can have some negative impacts on prices during that season. In addition, combining maximum one-trip option with DMV closure would also reduce the flexibility for the vessels to optimize their incomes by choosing where and when to fish in response to the resource and market conditions as discussed above in relation to the DMV area-time closures. Therefore, the impacts of the combination alternative on the

scallop fishery will depend whether the positive impacts on costs, meat-weight and prices would outweigh the negative impacts. In addition, late opening of the HC area in 2011 could encourage fisherman to take most of their DMV trips before July and reserve months of September and October for the HC trips, further reducing any impacts this closure may have.

- As discussed above, maximum 1-trip alternative would remove a similar number of trips from the turtle window compared to a July - Oct DMV closure depending on the temporal shift of effort. Again the total number of trips is expected to decline to 186 trips with the maximum one-trip alternative. Combining this option with a July - October DMV closure will limit number of DMV trips to 36 trips during the turtle season if vessels prefer to take all the HC trips (151 trips) they were planning to take during this season. Because DMV will be closed during July to October however, these 36 trips could only take place during the last 2 weeks of June. This means shifting about 648,000 lb. of landings (36 access trips at 18,000 lb.) to a narrow window with possibly negative impacts during June 15th- July 1st. Without the closure, the same amount of landings could be distributed to the entire turtle season. Furthermore, shifting the effort from July to October would reduce the meat weights by 5.5%, increase costs and lower prices. In short, combining “maximum 1-trip” alternative will probably have some negative impacts on the fishery although these impacts cannot be quantified with certainty.

Reducing Open Area DAS allocations in Mid-Atlantic: In order to remove about 9% of effort (slightly less than the 10% threshold but comparable to a DMV closure from July to Oct) from the Mid-Atlantic during the turtle season, it would be necessary to reduce total DAS-used in the Mid-Atlantic open areas by about 70% (column D), or by 890 days to a total of 381 days. Since all vessels do not fish in Mid-Atlantic open areas from July to September, a limit on the open area DAS-used would effectively only impact vessels that tend to fish in that area and time period.

The number of vessels that would be affected from a reduction in DAS-used is estimated using the distribution of effort provided in Table 65, p.186 of the Framework 21 document. Out of about 340 limited access vessels, 143 vessels, or about 41.5% of the vessels, used DAS in the Mid-Atlantic during 5 months from June to October based on 2008 VTR data. Of the 143 vessels that did use DAS in the Mid-Atlantic during the turtle season the DAS used ranged from 2-47. The maximum DAS used in this analysis was 47 DAS (maximum allocation of 37 DAS plus 10 DAS carryover). The proposed reduction in Framework 22 would be implemented for 3 months from July to September, however. Therefore, probably fewer than 143 vessels would fish in the Mid-Atlantic open areas during these months. One way to estimate the number of vessels that would fish in the three months from July to September is to take 3/5th of the 143 vessels, which would be about 86 vessels.

Another way would be to apply the percentage of effort during these months to the number of vessels. It was estimated that about 327 full-time equivalent vessels would participate in the scallop fishery. The dealer data indicated that 21% of the landings in MA open areas took place during July-Sept. If it is assumed that the percentage of the vessels that fished during these months was 21% of the total, then the number of vessels that fished during these months would be 69. Therefore, the number of maximum open area days that could be allocated during July-Sept could be estimated by dividing 381 days (row 9) by the number of vessels that are likely to fish during this period ranging from 69 vessels to 86 vessels estimated using two different assumptions above. This would result in about a maximum number of days in the range of 4.5 to 5.5 days or average of 5 days. There were a few vessels (5 vessels) used less than 5 days in the past and may do so in the future too. When we factor in those 5 vessels that used less than 5 DAS (2 used 2 days and 3 used 3 days), the maximum number of open area DAS allocations in July-Sept. for a FT vessel would be slightly higher than 4.5 days using the lower bound on the maximum number of days and assuming 86 vessels will fish in MA open areas during July-Sept. Another way of estimating maximum number of days is to use the average number of vessels, 77.5 vessels (69+86)/2) and divide 381 days with 77.5 vessels which would result in about 4.92 DAS per vessel. Again given that a few vessels used less than 5 DAS, factoring this in would increase maximum number of days to approximately 5 days a vessel. In short, given that there is a lot of uncertainty about the number of vessels and the fishing effort for each vessel, 5 days maximum seems to be a good estimate using these various methods. Reducing open area DAS would shift 9% of effort to the period Nov-June 15. If, however, that some of the Mid-Atlantic DAS removed from July to September was shifted to October-June period, the percentage shift in effort out of the turtle season will be less than 8.1%.

This option has several drawback compared to the other RPM options. First of all, reducing open area DAS during July-Sept and moving the effort to a less productive season when the meat weights would be 3.7% lower will result in reduced landings (by 78,422 pounds) and revenues (by $598,822). A limit of 5 DAS per vessel is very restrictive because that is shorter than a typical trip, so many vessels would not fish at all. On the other hand, allocating more DAS, such as 10 days per vessel, would result in a total of 730 to 860 days and a little reduction in effort during July to Sept. In addition this option is expected to have high distributional impacts as described in Framework 21, thus less favorable compared to other options.

5.3.8.1.3.2 RPM Options for Alt1: 2012

Table 75. RPM options for year 2012 for allocation alternative 1 (Alt1: 1.5 trips for HC and 0.5 trips for DMV)

Row #	2012	DMV Closure Sept - Oct	DMV Closure July - Oct	HC Closure Aug-Sept	HC Closure Jul-Sept	**June15-Oct31** Combine B and C	1 trip max. in MA June15-Oct31 (or combination with DMV closure)	Reduce open MA DAS July-Sept.
1	Column	**A**	**B**	**C**	D	**E**	**F**	G
2	Projected # of trips in window PRE RPM TW	97	239	77	185	298	298	3.9
3	Projected # of trips in window POST RPM TW	54	173	28	39	220	188	1.2
4	Difference in # of trips in MA AA during window	42	66	77	146	78	111	-2.7
5	Total landings in MA AA in window PRE RPM	1,745,710	4,308,392	1,902,192	3,324,092	5,364,000	5,371,250	3,321,126
6	Total landings in MA AA in window POST RPM	980,920	3,120,073	507,321	696,233	3,967,274	3,379,412	996,338
7	Difference in landings in MA AA during window (negative)	(764,790)	(1,188,319)	(1,394,871)	(2,627,858)	1,396,726	(1,991,839)	(2,324,788)
8	Projected DAS used in MA AA during win. PRE RPM	730	1654	755	1291	2,122	2125	1355
9	Projected DAS used in MA AA during win. POST RPM	410	1198	201	270	1,569	1337	406
10	Difference in projected DAS used in MA AA during win.	-320	-456	-554	-1021	-553	-788	-948
11	% reduction in MA AA effort during window	-44%	-28%	-73%	-79%	-26%	-37%	-70%
12	Total effort during window (DAS-used in MA+GB)	3328	8837	4761	7415	10526	10526	7471
13	Total effort shift in MA (AA +OA) during window	9.6%	5.2%	11.6%	13.8%	5.2%	7.5%	12.7%
14	Change in MW in window	-6.6%	5.5%	1.3%	4.3%	2.2%	2.2%	3.7%
15	**% Change in F**	**-0.6303%**	**0.2825%**	**0.1498%**	**0.5893%**	**0.1177%**	**0.1678%**	**0.465%**
16	Change in fishing costs	-32,653	40210	11409	70432	36,460	28,423	0
17	Change in landings	0	-	-	-	-	0	(82,817)
18	Change in revenue	Positive	Uncertain	Uncertain/ Negligible	Uncertain	Uncertain	Uncertain	(632,381)
19	% shift of from June 15-Oct31 window assuming all effort shifts out of this season	-3.0%	-4.3%	-5.3%	-9.7%	-5.2%	-7.5%	-9%
20	% shift of effort to June 15 - Oct31st	67%	15%	80%	25%	15% for DMV-80% for HC	0%	10%
21	Number of trips shifts to June15-Oct31	28	10	62	36		0	
22	Shift of effort (DAS) to June 15 - Oct31st	-214	-68	-443	-255		0	-95
23	**Net shift off effort from June 15-Oct31**	**-105**	**-388**	**-111**	**-766**	-553	**-788**	**-853**
24	**B. % Net shift of effort**	**-1.0%**	**-3.7%**	**-2.3%**	**-7.3%**	-5.2%	**-7.5%**	**-8.1%**

Rows 2 to 18 show the results of each RPM option for specific the window shown in each column. Gray shaded area (rows 19-24) represents the shift out of the Turtle season (June 15 – Oct 31st) based on several assumptions. It should be noted that percentage effort shifts that were assumed in Row 20, for columns A and B (for DMV) were based on the 2010 data. For HC effort shifts, however, the values in row 20 are just assumed as a part of a alternative analysis. The spreadsheet model could be used to analyze the results with other assumptions about the likely shifts of effort when one area is closed to fishing for a specific period of time.

DMV closure from September to October: The results of the analysis are similar to the closure of DMV in 2011 except that the impacts would be lower, about one-half of the levels for 2011 because there will be one half trips allocated for this access area. This alternative would remove about 42 trips or 320 DAS-used (Row 10-column A), from these months, which is equivalent to a shift of 9.6% (row 13 – column A) of effort from Sept - Oct This represents a shift of 3% from the total turtle season assuming that none of these 320 days are shifted to June 15-Aug.31st (320DAS-used / 10526 DAS-used (row 10– column A / row 12– column C). This is obviously an unrealistic assumption representing the upper limit for effort shift.

- According to the preliminary data for 2010, 67% of the effort normally taken during Sept - Oct was shifted to June to August. If the same % shift was applied, 214 out of 320 of days removed from Sept to Oct would shift to the Turtle season (row 22 of column A) and the net change in effort during the overall window would be 200 days (Row 23=Row 10- Row 22). This would correspond to a 1% shift in effort to outside of the turtle season (row 23 of Column A/row 12 of Column C).
- Because the meat-weights are lower in September-October compared to the rest of the year, closing DMV could have positive impacts on the yield and could benefit fishermen if they receive higher prices for the larger scallops outside of this window.
- Fishing outside of this window would also lower the fishing costs because the higher meat weights could result in shorter fishing time. If all the effort removed from this window was used outside of the turtle window distributed somewhat evenly during those 7.5 months (Nov - June 14), estimated fishing costs would decline by about $32,563 for the fishery as a whole.
- Therefore, although the impacts of this alternative on the scallop fishery are expected to be somewhat positive, these impacts will probably be small.

DMV closure from July to October:
Again, the results of the analysis are similar to the closure of DMV in 2011 except that the impacts would be lower, about one-half of the levels for 2011 because there will be one half trips allocated for this access area. Without any effort shifts to June 15-July 1st, a 4-month closure of DMV from July to the end of October could remove about 66 DMV trips expected during this window. This would constitute a 4.3% shift in effort from the entire turtle window to the remaining months of the year with positive effects on turtles. However, if it was assumed that 15% of the effort removed from this window might shift to June 15-July, net effort reduction would be 388 days (Row 23 Column B) and 3.7% (row 24, Column B) of the total effort during the entire Turtle season. This option have the same pros and cons discussed above for 2011 RPM alternatives with the exception that the impacts on the fishery would be smaller because of the half number of trips that could be allocated to this area.

HC closure from August to September:
This alternative would remove 77 HC trips from this window without any shift of effort to the other months in the turtle season. If, however, it was assumed that 80% of these trips shifted to June 15-July 31st and to October, the net reduction in trips in the entire window would be quite small, 15 trips, which corresponds to a 2.3% effort shift from the turtle window resulting in negligible effects on turtles and the scallop fishery.

HC closure from July to September:
Without any shift of effort this option would remove 146 HC trips or 79% of the effort from this window, which would increase F by 0.58% (largest impact compared to other alternatives) and would shift 9.7% of the effort from the turtle season. If 25% of these 146 trips were shifted to June 14-June 30th and October, total effort shift would decline to 766 days. This corresponds to a 7.3% effort shift from the entire turtle season. In terms of impacts on the fishery, time-area closures tend to increase costs and lower fishing profits by reducing the flexibility for the vessels to optimize their incomes by choosing where and when to fish in response to the resource and market conditions. If all the effort removed from this window was used outside of the turtle window distributed somewhat evenly during these 7.5 months (Nov-June 14), the fishing costs are estimated to increase by about $70,432 for the fishery as a whole.

Combining HC closure in August to September with the DMV closure in July-October:
Combining HC and DMV closure will reduce the number of trips during the turtle season less compared to a one trip maximum if the vessels shift 15% of the reduced DMV trips to June 15-June30, and if they shift 80% of the reduced HC trips to June 15-July plus October. While this alternative closes both areas for substantial amounts of time, vessels could still fish several trips during the overall turtle season (June15-October 31) because there is no limit on the total number of Mid-Atlantic access area trips during that time period. This combined alternative may not be that restrictive in reducing effort during the turtle season since vessels could take their HC trip in June, July or October, and their DMV trips in June. Compared to the one trip max alternative, this combined option may not be as effective in limiting the total amount of effort during the total turtle season.

Maximum one-trip alternative:
The maximum one trip alternative (Column F) encompasses the entire turtle season (June 15 – Oct 31st). It is estimated that 298 trips would be taken during this window in the HC and DMV areas. Reducing trips from 2 to 1 is equivalent to a 37% reduction in effort during this window, i.e., by 111 trips (Table 74). In other words, total number of trips would decline from 298 trips to 188 trips.

If we assume that vessels choose to take only HC trips during this window (226 trips PRE-RPM, 188 POST-RPM), this means that they would take rest of their 38 HC trips during Nov- June 14 and would take all of their DMV trips out of the turtle season. On the other hand, if vessels choose to take DMV trips during this season first, then it is estimated that 72 DMV trips would be taken during this season, and the rest of the 116 (188-72) trips would be taken in the HC area.

Therefore, this option provides flexibility to the vessels to choose which area and when to fish to optimize their revenue and reduce their costs.

Again, it is important to note that the analyses of the 1 trip max alternative assume no trading of trips. The number of vessels expected to take one or two trips during the turtle season is based on historical trends of effort in ETA in 2007 and 2008 using Table 68 of the Framework 21 document. The percent of vessels that took one or multiple trips during the season were used to predict the amount of effort that would be shifted due to a one trip max restriction. This calculation indicated that the number of trips during the Turtle season could decline by about 37% if the number of trips is restricted at one trip per vessel. In 2011 and 2012 some vessels will receive only one MA trip, two or even three depending on the results of the lottery. In addition, some vessels may trade in additional MA trips, so impacts could actually be higher for those vessels if a one trip max is selected reducing the amount of time those trips can be taken during the year.

Combining DMV closure in September to October with the maximum one-trip alternative:

- Maximum one trip alternative would reduce the number of estimated trips from 298 to 188 during the entire turtle season again assuming that there will be no trading of access area trips (less number of trips with trading). If DMV was closed in September to October, 42 trips would be removed from that window and some of these trips could be shifted to either June 15 - August 31st or to the outside of turtle window.
- If all of these trips were shifted to Nov-June 14 window, this means that the vessels could take 173 HC trips during the turtle season, which is in accordance with the previous seasonal activity in that area. In addition to these trips, the vessels could take about 15 trips in DMV (188-173) during the June 15 - August window, which is less than the number of expected shift of trips (28 trips =Row 21 of Column A) if DMV was closed in September to October without any limits on the maximum number of trips. Because the total number of trips are not expected to exceed 188 trips, total effort removed from the turtle season (788 days) with the combination alternative could be equivalent to the total effort removed by the maximum one trip alternative without any DMV closure. In other words, both the combination and the maximum one trip alternative would result in a 7.4% effort shift from the turtle window.
- The only difference is that combination alternative would limit DMV effort to the June 15 - August window, and there would be less DMV trips during the entire turtle season. However, given that turtle intakes are higher in DMV during Sept - Oct relative to the other seasons, combination alternative may have higher benefits on turtles than maximum one-trip alternative.
- The impacts of the combination alterative with a two month DMV closure are expected to be uncertain and small on the scallop fishery. As indicated above, closing DMV and shifting some of the trips out of Sept - Oct would lower the fishing costs because the higher meat weights could result in shorter fishing time. The fishing mortality rate could slightly decline as well for the same reasons. However, pushing some DMV trips to the June 15-August window can have some negative impacts on prices during that season. In addition, combining maximum one-trip option with DMV closure would also reduce the flexibility for the vessels to optimize their

incomes by choosing where and when to fish in response to the resource and market conditions as discussed above in relation of the DMV area-time closures. Therefore, the impacts of the combination alternative on the scallop fishery will depend whether the positive impacts on costs, meat-weight and prices would outweigh the negative impacts.

- The combined measure of a one-trip max and the longer Delmarva season (July-October) was not evaluated in great detail since the 4 month DMV closure alternative was found to have the largest impact on overall fishing mortality. Based on the results from 2011, it is estimate to increase F by 0.48% if there was no shift in effort and by 0.40% if 15% of the effort removed shifted to June 15 - July window. Therefore, combining this with the one trip max alternative was expected to have more than minor impacts.

Reducing Open Area DAS allocations in Mid-Atlantic: The explanation is the same as provided for year 2011 above in Table 73**.** Reducing 70% open area DAS from the MA open areas (Column D) from July to September would require limiting use of open area DAS to about 5 DAS per FT vessel and would result in approximately 8.1% shift of effort to the period Nov-June 15. Again, this option has several drawbacks compared to the other RPM options. First of all, reducing open area DAS during July-Sept and moving the effort to a less productive season when the meat weights would be 3.7% lower will result in reduced landings (by 82,817 pounds) and revenues (by $632,381). A limit of 5 DAS per vessel is very restrictive because that is shorter than a typical trip, so many vessels may not fish at all. On the other hand, allocating more DAS, such as 10 days per vessel, would result in a total of 730 to 860 days and a little reduction in effort during July to Sept. In addition this option is expected to have high distributional impacts as described in Framework 21, thus less favorable compared to other options.

5.3.8.1.3.3 RPM measures for 2013

Because the number of access area allocation in DMV and HC areas in 2013 are going to be exactly the same in 2012 , the same analyses that were done for 2012 is valid for the 2013 fishing year as well. The original 2013 projections included a 35 open area DAS, again very close to the projected DAS allocation for 2012 (34 days). The open area DAS allocations for 2013 may be set at a lower level (26 DAS), however, as a precaution to prevent vessels exceeding potential DAS allocations that may be lower than 35 DAS based on the updated assessments in 2012. If, during the entire 2013 fishing year open area DAS allocations were set 26 (or any value below 34 days), the impacts of the various RPM options in terms of the percentage effort shifts from the turtle window will be higher. This is because the access area effort and landings will constitute a higher proportion of total effort during the turtle season.

Table 76 – Summary of 2013 allocations suggested by the Committee for Alternative 1. The original projection included 35 open area DAS

	CA1	CA2	NL	HC	DMV	ET	Total	Channel	OA DAS
2013	-	1	1	1.5	0.5	-	4	open	26

	CA1	CA2	NL	HC	Del	ET	Total	Channel	OA DAS
Option 1									
2011	1.5	0.5	-	1	1	-	4	open	32
2012	0.5	1	0.5	1.5	0.5	-	4	open	34

5.3.8.1.3.4 Conclusions

For 2011-2013, closing DMV alone in September –October area is probably well below the threshold “for more than minor”. Similarly, in 2012-2013 closing DMV in July - October or HC area alone in Aug-Sept will probably be well below the threshold “for more than minor”. Closing HC in July to Sept could result in an increase in fishing mortality close to 0.5% if no more than 25% of the removed effort could be shifted to June and to Oct. Combination alternative with HC and DMV closures in different time periods (E) is less likely to work because the effort removed from the short windows could be shifted to the other months in the Turtle season in absence of restrictions on the maximum number of trips.

As in 2011, for 2012-2013 the maximum trip alternative would result in the largest shift (with the exception of the limiting open area DAS use in MA) in effort out of the turtle season. It is important to note that the analysis of the 1 trip max alternative assumes no trading of trips. The number of vessels expected to take one or two trips during the turtle season is based on historical trends of effort in ETA in 2007 and 2008. The percent of vessels that took one or multiple trips during the season were used to predict the amount of effort that would be shifted due to a one trip max restriction. In 2011 and 2012 some vessels will receive only one MA trip, two or even three depending on the results of the lottery. In addition, some vessels may trade in additional MA trips, so impacts could actually be higher for those vessels if a one trip max is selected reducing the amount of time those trips can be taken during the year. As discussed at the final Committee meeting, the 1 trip maximum alternative does have a higher degree of certainty in terms of the maximum effort that will take place in MA access areas during the turtle season. By restricting the entire fleet to one trip, you are certain about the maximum amount of effort. On the other hand, the seasonal closure alternatives cause effort shifts that are difficult to predict because some effort may be redirected outside of the turtle season, but some of it could be shifted to other months with even higher turtle bycatch rates.

Maximum one- trip alternative can be combined with a DMV closure too without any change in results in terms of effort shifts presented in the tables because this alternative encompasses the entire turtle season. Only difference is that combination alternative would limit DMV effort to the June 15-August window, and there would probably be less DMV trips (but more HC trips) during the entire turtle season. Given that turtle takes are higher in DMV during Sept - Oct relative to the other months and areas, excluding July, the combination alternative may have higher benefits on turtles compared to maximum one-trip alternative alone (Table 81). In addition,

Table 82 shows that the DVM closure alone may have an average percent reduction in takes of 27% compared to 35% for the combined DMV and 1-trip max alternative.

In terms of impacts on the scallop fishery, closing DMV and shifting some of the trips out of Sep-Oct would lower the fishing costs because the higher meat weights could result in shorter fishing time. The fishing mortality rate could slightly decline as well for the same reasons. However, pushing some DMV trips to the June 15-August window can have some negative impacts on prices during that season, but positive impacts outside of these months. In addition, combining maximum one-trip option with DMV closure would also reduce the flexibility for the vessels to optimize their incomes by choosing where and when to fish in response to the resource and market conditions as discussed above in relation of the DMV area-time closures. Therefore, the impacts of the combination alternative on the scallop fishery will depend whether the positive impacts on costs, meat-weight and prices would outweigh the negative impacts.

5.3.8.1.4 Discussion of impacts of effort shifts on prices

The proposed measures will lead to a change in the seasonal composition of landings and therefore could lead to a change in prices. In general, the reduction in landings during the turtle window is expected to increase prices during the period from July 15 to October 31, but expected to reduce prices for months outside of the turtle window. Whether the increase in scallop prices in the first period will offset the decrease in prices in the second period will depend on the magnitude of the shift, the timing of the displaced effort, and the change in meat weight of scallops outside of the turtle window. If the shift in effort and landings comprises a small proportion of total effort and landings in the turtle window the impacts on prices will be low. Similarly if the displaced effort is distributed more or less evenly throughout the window it is shifted to, the impacts on prices will be small.

Among the various alternatives under consideration, the maximum shift in landings from the turtle season are expected to happen with the maximum one-trip (about 1.9 million lb. during 2011-2012, or about 6.5%-7.2% of the total landings during the turtle season) and the alternative that would reduce Mid-Atlantic open area DAS (2.3 million lb., or about 7.5% to 7.8% of the total landings during the turtle season). Although, this shift is expected to increase the prices during the turtle season, it is unlikely for this shift to have a significant impact on the scallop prices for the overall year.

- The landings removed from the turtle season, about 1.9 million for the maximum-trip alternative, will be landed in the November – June 14 window. Since total landings from all areas without the RPM measures are expected to be about 26 million pounds in 2011 and 28 million lb. in 2012 during this period, shifting 1.9 million pounds would increase landings by 7.3% (2011) and by 6.7% (2012) outside the turtle window and would probably lower the price of scallops. Again, it is unlikely that this shift will reduce prices significantly during this period, especially if the displaced effort is distributed more or less evenly and if some vessels try to maximize their revenue by taking their trips during months when prices are relatively higher because of lower landings.

- Since the reduction in landings during the turtle window (7.2% for 2011) is about the same as the increase in landings (7.3%) outside of the turtle window, the percentage increase in prices could cancel out the percentage decline in prices outside the turtle window with little impacts on the average annual prices.
- The meat-weights will be slightly lower for the landings that are shifted out of the turtle window and this could have a negative impact on prices depending on when and where the effort removed from the turtle season will be used to fish for scallops. The larger scallops, U10s and U12s are sold at a significant price premium compared to the smaller size scallops and larger scallops caught more in summer months than the rest of the year (Table 78 - Table 80). If effort is shifted to winter months, there will be less of U10s landed with negative impacts on prices. Therefore, it is more likely that a higher percentage of effort will be shifted to the May – June 14 where meat weights are higher even compared to the turtle season. Given that in 2011, HC Canyon area will probably not open to fishing until the summer months of June to July, probably many DMV trips will be taken prior to June-July when the meat weights are large reducing the impacts of DMV closure for a long period or the impacts of a maximum 1-trip option. As a result, composition of annual landings in terms of size categories, thus the annual average prices, may not change significantly.
- Furthermore, if the reduced effort during the turtle window directed more on the areas with higher scallop abundance, meat-weight composition of the landings could increase during this window, resulting in even higher prices. It is also unlikely for this 7% shift in effort and landings to reduce prices significantly during the 7.5 months outside of the turtle window especially if the displaced effort is distributed more or less evenly and if some vessels try to maximize their revenue by taking their trips during months when prices are relatively higher because of lower landings especially during the winter months. The changes in other factors that impact prices such as the quantity of exports, import prices, size composition of scallops during and outside of the turtle window, and seasonal distribution of future landings are unknown at this time. In short, although it is not possible to quantify the impacts of RPM measures on prices with certainty, it is reasonable to expect that these impacts will be rather small.

Table 77. Average prices by size category and period (2009)

MONTH	UNDER 10 COUNT	11-20 COUNT	21-30 COUNT	31-40 COUNT	Grand Total
01	8.14	7.24	6.84	6.92	7.31
02	9.08	7.43	6.89	7.29	7.73
03	8.14	6.53	6.21	6.34	6.87
04	7.79	6.00	6.05	6.15	6.55
05	7.76	5.88	5.99	6.33	6.48
06	7.44	5.80	5.61	6.08	6.29
07	7.89	6.27	6.06	5.88	6.69
08	8.18	6.25	6.12	6.43	6.84
09	8.37	6.66	6.31	6.51	7.02
10	8.56	6.66	6.27	6.36	6.99
11	9.18	6.93	6.53	6.67	7.24
12	10.09	7.60	6.33	6.13	7.47
Grand Total	8.17	6.44	6.19	6.33	6.85

Table 78. Average prices by size category and period (2010)

Window	YEAR	UNDER 10 COUNT	11-20 COUNT	21-30 COUNT	31-40 COUNT
Jan - May	2010	10.50	7.28	6.36	6.27
June	2010	10.15	6.86	6.72	6.77
July - Oct	2010	10.21	8.37	8.26	8.50

Table 79. Landings by size category and period (2010)

July - Oct	YEAR	UNDER 10 COUNT	11-20 COUNT	21-30 COUNT	31-40 COUNT	Grand Total
O-TWIN	2010	2,171,284	15,926,736	5,094,883	69,661	23262564
June	2010	870,924	5,202,728	452,111	2,235	6527998
TWIN(July - Oct)	2010	5,482,071	10,784,776	2,631,233	11,903	18909983
Grand Total		8,524,279	31,914,240	8,178,227	83,799	48700545

Table 80. Percentage composition of landings by size category and period (2010)

July - Oct	YEAR	UNDER 10 COUNT	11-20 COUNT	21-30 COUNT	31-40 COUNT	Grand Total
O-TWIN	2010	9.33%	68.47%	21.90%	0.30%	100.00%
June	2010	13.34%	79.70%	6.93%	0.03%	100.00%
TWIN(July - Oct)	2010	28.99%	57.03%	13.91%	0.06%	100.00%
Grand Total		17.50%	65.53%	16.79%	0.17%	100.00%

5.3.8.1.4.1 Additional issues to consider

There are several other factors that would affect the change in prices for scallops, such as a change in import or export prices in response to changes in the seasonal composition of landings, the change in numbers of U10 or U12 scallops as a proportion of monthly landings, fluctuations in monthly disposable income, and changes in seasonal demand. Many of these factors are unknowns at this point, making it difficult to accurately estimate the impact of effort shifts on prices. For example, if more scallops are imported in response to lower domestic landings during the turtle window, the price of scallops may not increase during these months, or may increase by a negligible amount. There is no question that the uncertainties created by these shifts in the seasonal composition of effort and landings will make it difficult for vessel-owners to make their plans about where and when to fish and could possibly lead to reduced economic efficiency and to higher costs, reducing vessel profits further.

The analyses provided above do not take into account the distributional impacts of turtle measures and effort shifts for various ports, states, and vessels of different size categories. Because turtle measures will require a reduction in effort in the Mid-Atlantic areas, they are expected to have greater negative impacts on vessels homeported in the Mid-Atlantic areas, particularly those that are smaller vessels that have less mobility to travel to other fishing grounds and are more vulnerable to the weather conditions.

Overall, it needs to be said that that there are many unknowns about these types of measures in terms of what the outcomes will actually be. Impacts may be very different from these measures if assumptions made in these analyses are not realized. For example, if a seasonal closure in Delmarva shifts effort differently than it did in 2007 - 2009from the ETA closure impacts on scallop fishing mortality, revenue, and turtles could be very different. If more effort is shifted into July and August that will reduce fishing mortality but could increase potential interactions with sea turtles. On the other hand if effort shifts primarily to months like November, December, March and April fishing mortality will be higher than projected and impacts on turtles will likely be lower than projected because all these months are outside the turtle season. Vessels tend to fish to maximize potential revenues when yields are generally highest, but the market is unpredictable and behavior constantly adjusts. Therefore, it is very difficult to know in advance if measures such as these will ultimately have more than a minor impact on the fishery or not.

In addition to the primary measure of “more than minor” (percent change in effort shift) the PDT included a description of other factors that could influence impacts on the fishery that were not directly considered in this analysis. A shift in effort could also affect the following:

- concern about safety at sea (shift to winter months),
- changes in bycatch (i.e. fluke bycatch increases in winter months when overlap with scallop fishery offshore),
- revenue impacts because of reduced catch and changes in price, costs, markets, supply, etc.,
- impacts on the ability of the observer program to maintain coverage from surges and shifts in effort, and

- general impacts of altering rotational area management and compromising the ability to achieve optimum yield.

5.3.8.1.4.2 Overall PDT input

The PDT did not identify any of these measures as preferred recommendations because there was not time to review the analyses as a group. Some general comments voiced last year are repeated here again:

- Some felt the measures that focus on access area management may have lower distributional impacts.
- Some felt that more impacts could result from these measures then the analyses show due to all the unknown factors such as change in price and markets.
- Some raised concern about how these will ultimately impact turtles, positive or negative.
- Overall, how these measures fit in with the other issues in FW22 such as the potential new closed area in the Channel and YT allocation decisions in Framework 22 is very complex. Several outside factors such as these are likely to have combined impacts on area rotation that will be very difficult to predict.

5.3.8.2 Analyses used to assess the impacts of FW22 RPM alternatives on sea turtles

In the past the impacts on sea turtles of RPM specific alternatives designed to meet the requirements of the Biological Opinion were assessed qualitatively, by comparing shifts in fishing effort to historic patterns in sea turtle bycatch rates, particularly those before 2006 when chain mats were not required. (Note that if sea turtle abundance in the Mid-Atlantic increases in 2010 and beyond, the effect of effort shifts become less predictable). However, since FW21 there has been progress in quantifying the interactions of sea turtles and the scallop fishery.

Murray (2011) developed a model to estimate rates of turtle interactions in scallop dredge gear. The model estimated the expected number of takes per dredge-hour as a function of sea surface temperature (SST), depth, and whether or not the dredge was equipped with turtle excluder chains. For this analysis, interaction rates were averaged over each month and each Mid-Atlantic management area (Delmarva, Elephant Trunk, Hudson Canyon, and Mid-Atlantic Open areas) For the purposes of these calculations, interaction rates were based on dredges without turtle chains because an interaction with the chains is still considered a take even if the chains prevented the turtle from being caught.

Estimates of the average number of dredge hours required to complete an 18000 lb trip in each of the access areas were calculated from the area swept estimated by the SAMS model, assuming an average dredge width of 13.5.’ and average tow speed of 4.5 knots. This estimate was adjusted monthly for the seasonal meat weight variations based on monthly meat weight anomalies from the latest stock assessment (SARC-50), so that it requires more hours to catch 18000 pounds when the meat weights are poor. Multiplying the expected dredge hours times the expected takes per dredge hour gives estimates of take rates per 18000 lb trip by month.

In order to estimate the reduction in takes due to a proposed seasonal restriction, it is necessary to make assumptions regarding the monthly distribution of effort. There were no seasonal restrictions in the Delmarva area during FY 2009, so this effort distribution was used as the baseline for Delmarva assuming no seasonal restrictions. Similarly, the mean monthly effort distribution in the Hudson Canyon Access Area between 2004-2007 was used as a baseline for that area, assuming no seasonal restrictions.

Predicting how effort will shift after imposition of seasonal controls can either be based on empirical data from prior years that had such controls, or based on an assumption of how the effort will be redistributed. A two month September-October closure was imposed in the Elephant Trunk since its reopening in 2007, and in Delmarva in 2010. Alternatively, one could make an assumption as to the fate of effort that would be shifted out of the restricted time period. One possible assumption is that effort will be redistributed to other months in proportion to historical effort in those months. Another possibility is that effort will be redistributed to the adjacent months. Lastly, “worst case scenarios” can be considered, where all effort from the closure is shifted to other months where turtles are present, either June through August, or (very worst case) July and August. Empirical data for the effects of seasonal closures other than September-October are not available, so the analysis was based on above effort redistribution assumptions alone.

5.3.8.2.1 Results

Table 81 and Figure 47 summarize the estimated turtle take rate by month for each area included as a potential RPM: Delmarva, Hudson Canyon and open areas in the Mid-Atlantic. That rate is applied to the amount of scallop effort expected based on the number of trips per month under the baseline assumptions and the total number of dredge hours per month to give an estimated number of takes over all trips or DAS expected in the area and month.

Figure 48 compares these rates in projections for both 2011 and 2012, and includes estimated takes for open areas as well as access areas open in both 2011 and 2012. In order to use this information to estimate the effects of the RPMs some assumptions must be made on how effort will be distributed by month. Another important aspect included is an assumed change in meat weight by month. Since meat weight varies quite a bit by season, a meat weight anomaly was factored in that adjusts for changes in meat weight compared to the average from the scallop survey meat weight. Negative values imply that meat weights are lower than average and will have greater impacts on the scallop fishery compared to other months.

For Delmarva, the estimated turtle take per dredge hour rate is lower than HC in some months, but the takes per trip are actually higher because scallop biomass is lower so it takes longer to harvest a full 18,000 pound trip. September and October have the highest estimated takes per trip, followed by July.

For Hudson Canyon the estimated turtle take per dredge hour is higher than Delmarva in some months, but trips will be fished faster in that area because biomass is higher. August and September have the highest turtle takes per trip.

Open areas have lower estimated takes per dredge hour compared to HC and Delmarva.

Figure 47 – Comparison of projected takes per dredge hour for Delmarva, Hudson Canyon and open areas in the Mid-Atlantic excluding Elephant Trunk Area for 2011 (monthly meat anomaly in parentheses after month)

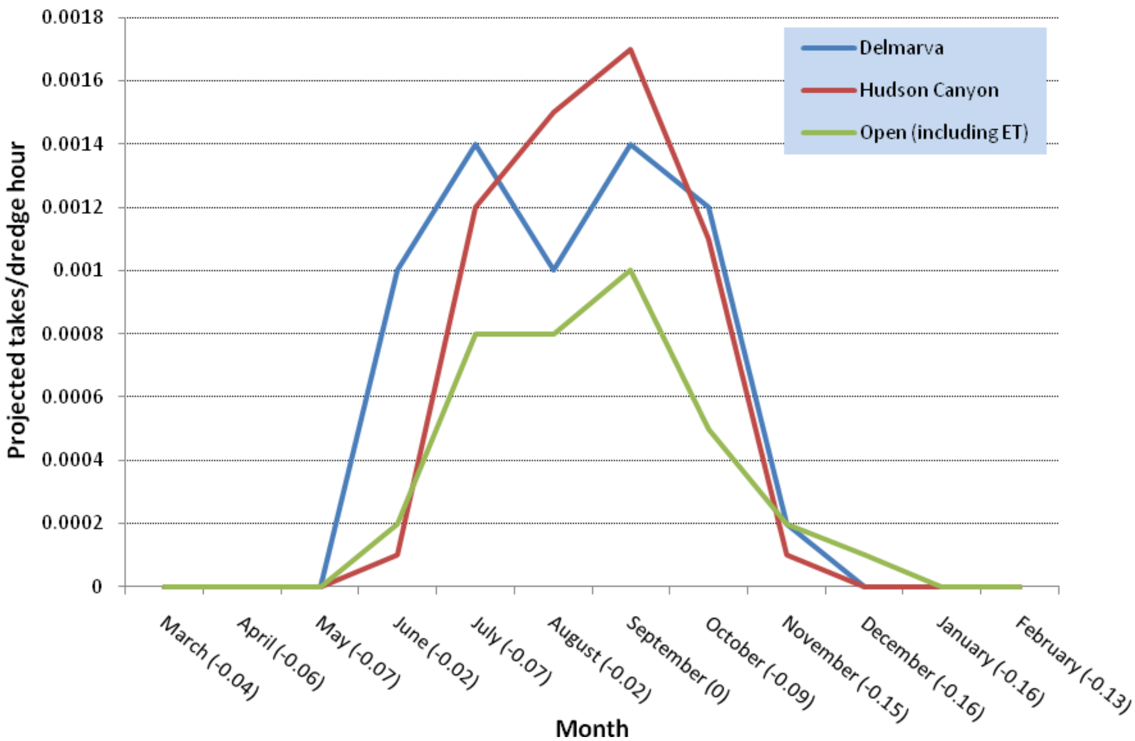


Table 81 – Monthly estimated turtle take rates in the scallop fishery by area

DELMARVA	2011					DELMARVA	2012				
Month	Takes/Drg Hr	NumTrips	DredgeHrs	Takes/trips	Takes	Month	Takes/Drg Hr	NumTrips	DredgeHrs	Takes/trips	Takes
March	0.0000	50.0	4650	0.00	0.0	March	0.0000	25.0	1949	0.00	0.0
April	0.0000	15.1	1267	0.00	0.0	April	0.0000	7.5	531	0.00	0.0
May	0.0000	39.0	3276	0.00	0.1	May	0.0000	19.5	1373	0.00	0.1
June	0.0010	23.5	2052	0.09	2.1	June	0.0010	11.7	860	0.07	0.9
July	0.0014	20.1	1678	0.12	2.5	July	0.0014	10.0	703	0.10	1.0
August	0.0010	24.9	2182	0.09	2.2	August	0.0010	12.5	914	0.08	0.9
September	0.0014	29.0	2593	0.12	3.6	September	0.0014	14.5	1087	0.10	1.5
October	0.0012	52.3	5138	0.12	6.4	October	0.0012	26.2	2153	0.10	2.7
November	0.0002	36.8	3878	0.02	0.6	November	0.0002	18.4	1625	0.01	0.3
December	0.0000	18.8	2000	0.00	0.0	December	0.0000	9.4	838	0.00	0.0
January	0.0000	12.5	1334	0.00	0.0	January	0.0000	6.2	559	0.00	0.0
February	0.0000	8.1	836	0.00	0.0	February	0.0000	4.0	350	0.00	0.0
TOTAL		330.0	30883.8	0.05	17.6	TOTAL		165.0	12943	0.04	7.4

Hudson Canyon	2011					Hudson Canyon	2012				
Month	Takes/Drg Hr	NumTrips	DredgeHrs	Takes/trips	Takes	Month	Takes/Drg Hr	NumTrips	DredgeHrs	Takes/trips	Takes
March	0.0000	17.4	1648	0.00	0.0	March	0.0000	26.2	2818	0.00	0.0
April	0.0000	36.4	2660	0.00	0.0	April	0.0000	54.6	4550	0.00	0.0
May	0.0000	51.7	2737	0.00	0.0	May	0.0000	77.5	4683	0.00	0.0
June	0.0001	68.0	3842	0.01	0.4	June	0.0001	102.0	6573	0.01	0.7
July	0.0012	51.3	2788	0.07	3.4	July	0.0012	77.0	4768	0.08	5.9
August	0.0015	37.2	1893	0.09	3.3	August	0.0015	55.8	3238	0.10	5.7
September	0.0017	18.7	1234	0.10	1.9	September	0.0017	28.0	2111	0.12	3.3
October	0.0011	14.2	830	0.07	1.0	October	0.0011	21.4	1420	0.08	1.7
November	0.0001	9.1	564	0.00	0.0	November	0.0001	13.7	965	0.00	0.1
December	0.0000	6.3	252	0.00	0.0	December	0.0000	9.4	431	0.00	0.0
January	0.0000	7.5	253	0.00	0.0	January	0.0000	11.2	433	0.00	0.0
February	0.0000	12.1	770	0.00	0.0	February	0.0000	18.2	1317	0.00	0.0
TOTAL		330.0	19471	0.03	10.2	TOTAL		330.0	33308	0.05	17.4

Open (including ET)					Meat Weight
	2011	2011	2012	2012	Anomaly
Month	**Takes/dhr**	**Takes/DAS**	**Takes/dhr**	**Takes/DAS**	
March	0	0	0	0	-0.04
April	0	0	0	0	0.06
May	0	0	0	0	0.07
June	0.0002	0.004	0.0002	0.003	0.02
July	0.0008	0.018	0.0008	0.016	0.07
August	0.0008	0.019	0.0008	0.017	0.02
September	0.001	0.022	0.001	0.021	0
October	0.0005	0.013	0.0005	0.012	-0.09
November	0.0002	0.005	0.0002	0.006	-0.15
December	0.0001	0.003	0.0001	0.003	-0.16
January	0	0	0	0	-0.16
February	0	0	0	0	-0.13

Table 82 is a summary of the turtle takes in the entire fishery before RPMs, and estimates of total takes after RPMs for the alternatives that were discussed in greatest detail at the Scallop Committee meeting. The presented percent reductions in takes are average reductions over several different assumed effort distribution alternatives. These reductions are not expected to occur, but may occur if additional restrictions are placed on the fishery to limit effort. More total takes are estimated to come from open areas compared to access areas because more effort is expected in open areas, not because the take rates are higher in open areas; take rates are actually lower for open areas compared to access areas (Figure 47).

In 2011, a total of 64 turtles takes are expected in this fishery and 58 in 2012. If the 1 trip max is implemented, a handful less takes is expected: 60 (5% reduction) in 2011 and 55 (6% reduction) in 2012. The two month seasonal closure in Delmarva alone is expected to reduce takes in Delmarva by 27% both years, reducing total takes in 2011 to 59 and 56 in 2012. When these two measures are combined the total reduction in estimated takes is 56 for 2011 (12% reduction) and 53 for 2012 (8% reduction). It should be noted that the values used to compute a reduction in turtle takes estimated under each RPM are not directly tied to the values used in the model to determine the "more than minor" threshold. Again, the turtle take reductions are averages over several different effort redistribution alternatives, whereas the "more than minor" threshold evaluates a single presumed change in effort. Each assessment uses different assumptions about changes in fishing effort.

The meat weight gain column shows the general impacts on fishing mortality; again negative values suggest that impacts will be negative and total fishing mortality will be higher due to an RPM. Most of these are expected to have relatively small negative impacts on *F*, with the exception of the 2 month seasonal closure in Delmarva, which is expected to have a positive impact on *F*.

Turtle takes are very rare events that are difficult to estimate precisely, so all estimates carry substantial uncertainty. The number of takes may vary greatly from year to year; the estimates are the expected (mean) number of annual takes – the number of takes in a given year may be even more or less. The measure with the most certainty may be the 1 trip max or the max number of DAS because with those measures the max effort that can take place during the entire turtle season is known. Actual effort may be lower, but it cannot exceed that amount because no effort can shift within part of the turtle season since these are restrictions that encompass the entire season.

Figure 48 – Comparison of monthly estimated turtle take rates in the scallop fishery by area with monthly meat weight anomalies

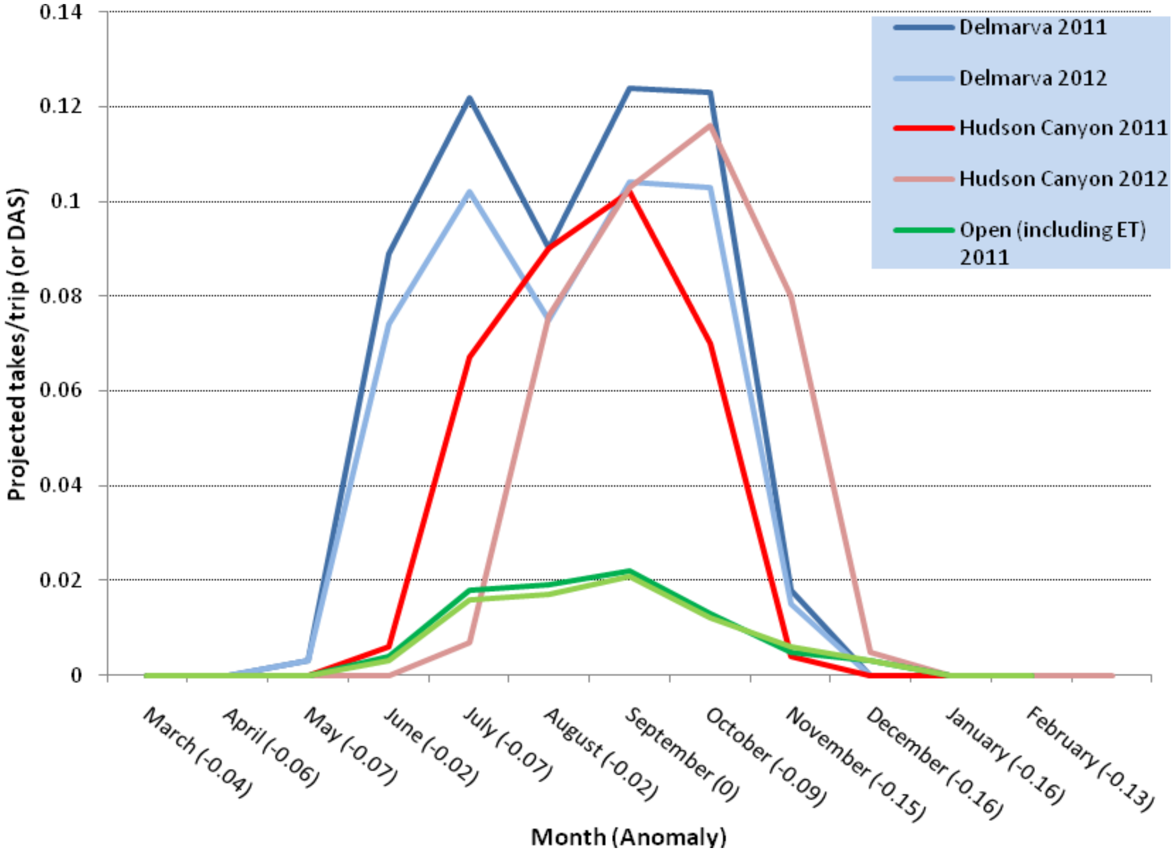


Table 82 – Total estimated turtle takes before and after certain RPMs considered

NoClosure	Est. Takes 2011		Est Takes 2012		
HCS	10		17		
Delmarva	18		7		
Open	36		33		
Total	64		58		
1 trip max	**2011**	**PctRed**	**2012**	**PctRed**	**MWGain**
HCS	9	13%	15	13%	-0.01
Delmarva	16	12%	7	12%	0
Open	36		33		
Total	60	5%	55	6%	
Sept/Oct Dmv	**2011**	**PctRed**	**2012**	**PctRed**	**MWGain**
HCS	10	0%	17	0%	0
Delmarva	13	27%	5	27%	0.02
Open	36		33		
Total	59	8%	56	3%	
Sept/Oct Dmv + 1 trip max	**2011**	**PctRed**	**2012**	**PctRed**	**MWGain**
HCS	9	13%	15	13%	-0.01
Delmarva	11	35%	5	35%	0.02
Open	36		33		
Total	56	12%	53	8%	

Note:

- ***The number of turtle takes for the RPM alternatives are average estimated turtle takes under a variety of effort redistribution alternatives.***
- ***The estimated expected number of takes is rounded to the nearest integer.***

The open area RPM and the restriction on number of trips in MA access areas will likely result in a reduction in turtle bycatch in the Mid-Atlantic, because effort will either be reduced in the region, or move into other seasons and areas where there have been very few turtle interactions.

The affect of seasonal closure RPMs for Delmarva and HC will depend on where and when fishing effort is displaced. If effort distributes like it did in 2010 in Delmarva, effort from September and October seems to be shifted to August, November and December (Figure 42), then impacts on turtles will be positive because the highest take rates are included in the seasonal closure window (September and October). Overall effort during warmer months seems to be relatively lower compared to cooler months when turtles are less likely to be present.

5.3.9 Modifications to VMS

As described in Section 2.10, two alternatives were considered: the No Action, which would not change the VMS regulations and Alternative 2.11.2, which would allow a vessel to turn their VMS unit off of it does not intend to land scallops. Neither of these measures is expected to have a direct impact on protected resources since it is related to enforcement and not where and how much vessels can fish.

5.3.10 Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line

Alternative 2.11.2 would reduce the possession limit seaward of the VMS demarcation line from 100 bu to something less (i.e. 65 or 75bu). However, since this alternative was first proposed, Amendment 15 increased the meat weight possession (trip) limit from 400 pounds to 600 pounds. The current 100 bu in-shell possession limit is more closely in line with the new 600 lb trip limit (see biological impacts section for observer data basket weight estimates to support this).

Any measure that reduces the incentive to shell-stock is viewed as having positive impacts on the scallop resource, and presumably on protected resources as well, as scallops are not being caught and possibly discarded unnecessarily. Because the new higher trip limit of 600 lb already reduces the incentive to shell stock under a 100 bu in-shell possession limit, both no action and the lower in-shell possession limit proposed by this alternative are expected to have minimal effects on the magnitude of impacts on protected species compared to increasing the possession limit.

5.3.11 Extension of unused ETA trips through May 31, 2011

This alternative would allow full-time vessels to use any unused FY 2010 ETA trips through May 31, 2011. This alternative is not expected to have major impacts on protected resources, however turtle catch rates are higher in May compared to most of the months remaining in this fishing year (December 2010 – February 2011). November is the only month that has a higher estimate of turtle takes than May, but all months between now and May are substantially lower than between July and October.

5.3.12 Eliminate reference to GB access area schedule in regulations

Alternative 2.13.2 would eliminate any reference to the two years closed/one year open schedule of access areas on GB. Openings should be based primarily on scallop resource and other factors like YT bycatch available, and not a default schedule that may not match current schedules and biological constraints. No Action would leave the schedule in place. Neither alternative in Section 2.13 is expected to have direct impacts on the protected resources; this issue is administrative.

5.4 ECONOMIC AND SOCIAL IMPACTS

5.4.1 Introduction

The following analyses provide an analysis of economic impacts of the three allocation options, and compare these with no action and status quo projections. The objective of the cost-benefit analysis is to evaluate the net economic benefits arising from changes in consumer and producer benefits that are expected to occur with implementation of a regulatory action. As the Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) [4] state "the proper comparison is '*with the action' to 'without the action'* rather than to *'before and after the action,'* since certain changes may occur even without action and should not be attributed to the regulation." Even without action, the scallop stock abundance in open and access areas will be different, requiring changes in open area DAS and trip allocations in order to maximize yield from the fishery over the long-term. As a result, landings, scallop prices, fishing costs, revenues and benefits from the fishery would change.

This action also includes a status quo option *(SQ)* to reflect the changes in landings and economic benefits as a result of changes in allocations from their 2010 values. The costs and benefits of the proposed measures are estimated both relative to the "No Action" and relative to the status quo (SQ) levels. Scallop Framework actions prior to Framework 21 compared the economic impacts of the proposed measures to the values for "No Action" alone because the projections for the no action and status quo usually coincided with each other. Because this is no longer true, however, using two separate baselines for the economic analyses provides additional insights as explained below:

- The benefits of the proposed action are compared to the "No Action" because the consistency of the Framework 22 analyses require that the biological and economic impacts of the proposed measures compared to the "No Action" (i.e., without the action) alternative as defined in Section 2.2.1 of the document. The definition of "No action" (Section 2.2.1) follows a regulatory approach and refers to continuation of the allocations that are specified in the present regulations so long as they are compatible with the other measures included in those regulations. Because of the restrictions in the rotational area schedules and rules about when an access area will be opened or closed to fishing, the "no action" alternative does not necessarily reflect, however, a "state" or baseline that correspond to the same amount of fishing effort as in the previous management actions. In fact, with the "No Action" alternative, the fishing effort in the access areas are expected to be significantly lower compared to the levels in 2009-2010 because of these restrictions. As a result, revenues for no action would be significantly lower ($364.5 million in 2011 and $290.1 million in 2012 –undiscounted values) compared to the actual revenues in 2009 ($379.5 million) and in 2010 (estimated to be about $431 million).

[4] Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions, March 2007, http://www.nmfs.noaa.gov/sfa/domes_fish/EconomicGuidelines.pdf

- From the perspective of the impacts on the economy and of the participants of the fishery, a baseline that would reflect potential economic impacts relative to the recent level of allocations would be useful, however. With the status quo (SQ) alternative, the vessels would be allocated exactly the same amounts of open area DAS (38 DAS per full-time vessel) in 2011-2012 and would have the opportunity to take the same number of (4 per full-time vessel) access area trips as they did in 2010. As a result, with this alternative total fleet revenue is projected to be $433.4 million in 2011, which is quite similar to the estimated revenue in 2010 ($431 million). Therefore, SQ alternative would reflect potential economic impacts of the proposed measures relative to the recent level of allocations. It must be cautioned, however, that the status quo allocations would result in F rates which are above the target F and are included here only for the analytical purposes to show the short and the long-term impacts of the reduction in fishing effort with the proposed action. The revenue projections for SQ alternative for the future years are different than the estimated values for 2010, however. This is because the continuation of the same number of open area DAS and access area trip allocations (SQ alternative) would increase the fishing mortality above the sustainable levels and reduce yield and revenues in the long-term.

As the Guidelines for Economic Analysis of Fishery Management Actions specify, "benefits and costs are measured from the perspective of the Nation, rather than from that of private firms or individuals. Benefits enjoyed by other nations are not included, although tax payments by foreign owners, and export revenues, are benefits to the Nation."

The overall benefit and costs of the fishery management actions generally vary over time depending on the rate of growth of the stock and according to the nature of management measures implemented to maximize the yield from fishery. Although a general guideline for the period of analysis cannot be established for all fishery management actions due to the diversity of possible situations and measures to be dealt with, the Guidelines state that "the period of analysis could reflect the time it takes for the fishery to move from its initial equilibrium along the expansion path to the final equilibrium point (including the time needed for the present value of costs and benefits to approximate zero) due to the adoption of the proposed regulation, holding all other influence constant." In addition, the Guidelines indicate that "a reasonable attempt should be made to conduct the analysis over a sufficient period of time to allow a consideration of all expected effects."

Because fishery management actions in general result in short-term costs for the industry in terms of foregone revenue, "choosing a period of analysis that is too short may bias the analysis toward costs, where costs are incurred in the short-term and benefits are realized later." Similarly, the Office of Management and Budget (OMB, 2003) indicated that the analyses should "present the annual time stream of benefits and costs expected to result from the rule," and state that "the beginning point for your stream of estimates should be the year in which the final rule will begin to have effects" and "the ending point should be far enough in the future to encompass all the significant benefits and costs likely to result from the rule."[5]

[5] OMB Circular A-4 (September 17, 2003), http://www.whitehouse.gov/omb/circulars_a004_a-4/

Furthermore, the economic impacts of the proposed regulations over the long-term should be evaluated by the discounted cumulative present value of the stream of benefits since benefits or costs that occur sooner are generally more valuable (or have a positive time preference). OMB Circular points out that the analytically preferred method of handling temporal differences between benefits and costs is to adjust all the benefits and costs to reflect their value in equivalent units of consumption and to discount them at the rate consumers and savers would normally use in discounting future consumption benefits (OMB, 2003). Discount rate is the interest rate used in calculating the present value of expected yearly benefits and costs. This Circular suggests that for regulatory analysis, the cost-benefit analyses should provide estimates of net benefits using both three percent and seven percent.

The benefits from the Framework 22 management action are expected to be realized over the long-term even though this action would mainly be implemented for two fishing years from 2011 to 2012. Section 5.4.3 examines both the short-term (fishing year 2011-2012 only) and the long-term (2013-2022) economic impacts of the proposed regulations. The present value of long-term benefit and costs are estimated using both a 3% and a 7% discount rate. The higher discount rate provides a more conservative estimate and a lower bound for the economic benefits of the proposed action compared with the benefits predicted using a lower discount rate.

5.4.2 No Action and Status quo

No action for the cost-benefit analysis of the Framework 22 alternatives is defined as "the continuation of all the measures including the open area DAS and access area trip allocations as specified in the present regulations, i.e., in Framework 21. Under "No Action," in open areas for both FY 2011 and FY 2012, full-time limited access scallop vessels would receive the same allocation as in FY2010: an allocation of 38 open area DAS. Part-time and occasional vessels would receive a pro-rata share of 40% and 1/12th, respectively, which is equivalent to 15 and 3 open area DAS, respectively. The FY 2010 trip allocations for access areas would also roll over into FYs 2011 and 2012. Full-time vessels would receive 2 Elephant Trunk Access Area (ETAA) trips, one trip in Delmarva both in 2011-2012 and one trip in the Nantucket Lightship Access Area (NLAA) in 2011 only. Part-time vessels would receive 2 access area trips to be taken in any of the areas and occasional vessels would receive one access area trip that could be taken in any one of these access areas (Table 2 and 3 in Section 2.2.1). A full description of the no action alternative is provided in Section 2.2.1.

The biological estimates for the "No Action" alternative show that this alternative will result in less than optimal long-term landings and economic benefits compared to the proposed action and other alternatives. Therefore, economic benefits of the proposed alternatives would exceed the benefits of the "no action" both in the short- and the long-term.

Table 83 indicates that over the long-term (2011-2022) the cumulative landings with No Action (643 million lb.) will be 20 million pounds less than the landings expected with the proposed action (663 million lb.). Similarly, the present value of the cumulative scallop revenues will be about $122.8 million (at a 7% discount rate) to $132.5 million (at a 3% discount rate) lower (Table 86), and the present value of the cumulative total economic benefits will be about $126.1 million (at 7% discount rate) to $136.5 million (at 3% discount rate) lower (Table 87) compared to the levels with the proposed action. The reasons for lower long-term benefits for the "No Action" compared to the proposed action and other alternatives could be summarized as follows:

- Due to the rollover FY 2010 allocations and the access area rotational closure schedule stated in the regulations, full-time vessels will be allocated three Mid-Atlantic access area trips in FY 2011 and FY 2012, but will not be able to materialize their allocations (2 trips) to ETAA in full because of the low biomass in that area. In fact, the biomass in the Elephant Trunk area will be too low to support a full trip let alone two trips in 2011. In addition, they will be able to use their one NLAA access area trip in FY 2011, but not FY 2012. Therefore, despite the allocations, the landings from ETA will be quite low. As a result, the total scallop landings for no action will be about 48 million in 2011 (Table 83), whereas the proposed action will result in 52.3 million lb. of scallop landings. No action landings would be even lower in 2012, about 39.2 million lb. the NLAA access area would be closed in 2012 and again landings from the ETAA will be quite low due to the poor biomass conditions in this area.
- The open areas DAS allocations (38 DAS in 2011-2012) would be higher than sustainable levels in 2011 and 2012 because the present conditions of biomass in those areas were not taken into account.
- In short, over the long-term landings, revenues, producer and consumer surpluses and total economic benefits under "No Action" would fall short of the levels corresponding to all of the other alternatives considered in this Framework because of the suboptimal allocation of open area DAS and access area trips.

The FY 2010 access area management measures to minimize turtle interactions would also roll over under "No Action", closing the ETAA and Delmarva turtle closures in September and October and restricting the number of trips that can be fished in these Mid-Atlantic access areas during June 15 – August 31.

This action also includes a status quo option *(SQ)* to reflect the changes in landings and economic benefits as a result of changes in DAS allocations from their 2010 values. Specifically, under SQ alternative, full-time limited access scallop vessels would receive an allocation of 38 days-at-sea in the open areas (same as no action alternative) and 4 access area trips, same as the proposed action. The only difference of this alternative from no action is that 4 access area trips were allocated to areas where there is sufficient stock biomass whereas under no action allocations would be determined according to the regulations in Framework 21.

Under the SQ alternative assumes that the full-time vessels would be allocated 4 access area trips to the same areas as in the proposed action. These areas would have sufficient biomass for vessels to land 18,000 lb. from each of the 4 access area trips. As a result, scallop landings from the access area will be the same as in 2010. Because the vessels would receive the same number of open area days (38 DAS) as in 2010, the landings (projected to be 57 million in 2011) are expected to be similar to the landings in 2010 (about 55 million lb. according to the preliminary estimates). SQ landings in 2012 would be even higher, about 59.8 million, and would exceed the levels for the proposed action (Alt1) and all the other alternatives (Table 83). This would result in higher revenues and economic benefits under the SQ alternative in 2011-2012 compared to all other alternatives (Table 86 and Table 87). However, status quo allocations would result in F rates which are above the target F and are included here only for the analytical purposes to show the short and the long-term impacts of reduction in the open area DAS allocations from 38 days in 2010 to 32 days in 2010 and to 35 days in 2011 with the proposed action.

The consequences of exceeding the target F would be lower landings, revenues and total economic benefits over the long term. Table 83 indicates that the cumulative landings with SQ in 2011-2022 (656 million lb.) will be about 7 million pounds less than the landings expected with the proposed action (663 million lb.). Similarly, the present value of the cumulative scallop revenues will be about \$19.8 million (at a 7% discount rate) to \$33.5 million (at a 3% discount rate) lower (Table 86), and the present value of the cumulative total economic benefits will be about \$22.8 million (at 7% discount rate) to \$36.7 million (at 3% discount rate) lower (Table 87) compared to the levels with the proposed action. In conclusion, there will be trade-offs between the short-term and long-terms benefits if the same number of open area DAS and access area trips as in 2010 were allocated in 2011-2012. Although, the revenues and economic benefits would be higher in these first two years, in the long-term, landings, revenues and total economic benefits for the SQ alternative would be lower than for the proposed action.

Table 83. Estimated Landings (million lbs)
2009 landings= 57 million lb., Estimated landings for 2010=55 million lb.

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	48.1	57.0	**52.3**	52.4	**48.8**
2012	**39.2**	**59.8**	57.2	56.0	56.8
2011-2012	87.3	116.8	109.5	108.4	105.7
2013-2022	556.0	539.1	553.5	546.3	541.3
Grand Total	643.3	656.0	663.1	654.7	646.9
Maximum difference in landings (million lbs) in 2012-2022	19.6	10.7	7.1	9.4	10.1

Table 84. Estimated Revenues (Undiscounted, Million \$)

2009 revenues=\$379.5 million, estimated revenues for 2010= \$431 million)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	364.5	433.4	**399.3**	402.1	**372.5**
2012	**290.2**	**446.8**	428.4	418.7	420.5
2011-2012	654.6	880.2	827.7	820.8	792.9
2013-2022	4150.2	4018.8	4118.6	4064.8	4025.6
Grand Total	4804.8	4899.1	4946.3	4885.6	4818.5
Maximum difference in revenues (million \$) in 2011-2022	148.9	82.6	44.3	71.7	62.2

5.4.2.1 Measures that will be in effect March 1, 2010 until Framework 22 is implemented (Section 2.2.3)

The specific measures that are included if this action is not implemented by March 1, 2011 will help to reduce the adverse impacts of exceeding the proposed allocations in Framework 22 in 2011 on the scallop resource. These measures are described in Section 2.2.3 of the Framework 22 document. Any excesses over the open area DAS-used or trip allocations for the access areas above the ultimate value allocated for 2011 will be reduced the following fishing year (2012). Any landings from within the Northern Gulf of Maine (NGOM) area caught in fishing year 2011 above the ultimate TAC for 2011 will be reduced the following year. The short-term impact of exceeding proposed allocations in 2011 will be positive in 2011, but negative in 2012 since vessels fished above the ultimate value allocated for 2011 will get smaller allocations in 2012. This will help reduce the negative impacts of overfishing in 2011 on the scallop resource over the long-term. Therefore, these measures will have positive long-term impacts on landings, revenues, producer and consumer benefit and net national economic benefits.

5.4.3 Aggregate economic impacts of the Framework 22 alternatives

Framework 22 includes three allocation alternatives (Alt1, Alt 2 and Schcl) in addition to the "no action' and status quo (SQ) alternatives. These alternatives allocate different number of open area DAS and access area trips in 2011 and 2012 as summarized in Section 2.5 and Table 85 below. For 2013, the same allocations were considered for all alternatives: 35 open area DAS, 0.5 trips in Delmarva, 1.5 trips in Hudson Canyon, one trip in NL and 1 trip in CA2. The biological model projected landings, LPUE and size composition of landings for each of these alternatives for 2011-2022. These projections were then used as inputs in the economic model to estimate prices, revenues, costs, producer and consumer surpluses and total economic benefits from the scallop fishery. It should be noted that The Scallop Committee and Council later decided to reduce open area DAS by 25% in 2013 as precautionary measure (Section 2.4.3), but the projections used for the biological and economic analyses uses the original projections of effort for 2013 since that is closer to what ultimate allocations will be when these default measures are replaced in a subsequent framework action (Framework 24). The economic impacts of the precautionary measures are described in Section 0 below.

The following sections analyze the aggregate impacts of these options on landings, effort, revenues, fishing costs, consumer and producer surpluses and net economic benefits. These analyses include the economic impacts both on the limited access and general category fisheries given that respectively 95% and 5% of the TAC is allocated to these fisheries. The impacts of the proposed action and alternatives on individual vessels are expected to be proportional to the aggregate impacts on revenues, fishing costs and net revenues (producer surplus).

Table 85– Framework 22 alternatives under consideration

	Access Area Allocations								Open Area DAS
	CA1	CA2	NL	HC	Del	ET	Total	Channel	
Alternative 1 (Proposed Action)									
2011	1.5	0.5	-	1	1	-	4	open	32
2012	0.5	1	0.5	1.5	0.5	-	4	open	34
Alternative 2									
2011	2	-	-	1	1	-	4	open	32
2012	-	1	1	1	1	-	4	open	34
Alternative 3									
2011	2	1	-	1	1	-	5	closed	22
2012	-	1	0.5	1.5	0.5	-	6	Open (2.5)	23
No Action									
2011	-	-	1	-	1	2*	4	open	38
2012	-	-	-	-	1	2*	3*	open	38
SQ - 2010									
2011	1.5	0.5	-	1	1	-	4	open	38
2012	0.5	1	0.5	1.5	0.5	-	4	open	38

** Trips may be allocated to this area, but there is not sufficient biomass in this area to support that effort, so trips will not be complete and catch for the area will be substantially lower than 2 trips typically produce, closer to 5 million compared to 12 million pounds.*

5.4.3.1 Acceptable Biological Catch

Reauthorization of the MSA requires the SSC to set an acceptable biological catch (ABC), or maximum catch level that can be removed from the resource taking into account all sources of biological uncertainty. The Council is prohibited from setting catch limits above that level. This new requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis. With no action, ABC for the fishery will be 26,219 mt (57.8 M lb) after accounting for discards. In addition, a default ABC for 2013 would also be 29,578 mt. or 65.2 million pounds. With the proposed action, the ABC calculation is based on the same analyses used for setting ABC in FW21 but the data was updated for 2010. As a result, ABC available to the fishery will be higher than the no action levels, 60.1 million pounds (27,276 mt) for 2011 and 63.8 million pounds (28968 mt) for 2012. As a result, this measure is expected to have positive impacts on the landings and revenues, producer and consumer surpluses and net economic benefits to the nation.

5.4.3.2 Summary of overall economic impacts of the allocation alternatives

The short-term and long-term economic impacts of the alternatives considered in this Framework could be summarized as follows:

- Both in the short-term (2011-2012) and the long-term (2011-2022), the sum of landings, revenues and economic benefits for the proposed options (Alt1, Alt2, and Schcl) will exceed the economic benefits for the 'No Action" alternative.
- Alternative 1 (Proposed Action) would result in largest landings compared to Alt2 and Schl both in the short- and the long-term (Table 83). Furthermore, Alternative 1 would result in a more stable stream of landings compared to Alternative 2 (Alt2) and Great South Channel closure alternative (Schcl). The difference between the maximum and minimum amount of landings during 2011-2022 is 7.1 million lb. for Alt1, 9.4 million lb. for Alt2 and 10.1 million lb. for Schcl. Status quo allocations would result in higher landings in the short-term, but lower landings over the long-run compared to Alt 1. In addition, fishing mortality rates would exceed the target F is the allocations were set at the same levels as in 2010. Therefore, status quo would not be a feasible alternative under the Sea Scallop FMP.
- Alternative 1 would result in largest fleet revenues, compared to Alt2 and Schl both in the short- and the long-term (Table 84 and Table 86). Present value (PV) of revenues for Alt.1 would exceed the revenues for Alt.2 by $6.5 million in the short-term (2011-2012), and by $53 million in the long-term (2011-2022).
- The difference in the PV of revenues for Alt.1 and Schcl alternatives is larger, with Alt 1 revenues exceeding the revenues for Schcl by $33.5 million in the short- and by $98.9 million in the long-term (Table 86).
- Similarly, Alternative 1 would result in largest producer and consumer surpluses and total economic benefits compared to Alt2 and Schl both in the short- and the long-term (Table 86). Economic benefits include the benefits both to the consumers and to the fishing industry and equal the sum of benefits to the consumers and producers. The total economic benefits for Alt.1 would exceed the benefits for Alt.2 by $7 million and the benefits for Schcl by $30.5 million in the short-term.
- Over the long-term from 2011 to 2022, the present value of the cumulative economic benefits for the proposed action (Alt.1) would exceed the benefits for no action by $136.5 million, SQ benefits by $36.7 million, Alt.2 benefits by $53.2 million and the benefits for Schcl by $95 million using a 3% discount rate ((Table 86). The value of total economic benefits over the long-term will be lower if a 7% discount rate is used to estimate the present value of the benefits but the benefits for the proposed action would still be exceed the levels for the alternative options as shown in Section 5.4.3.10 (Table 109).
- As discussed in Section 5.4.2 above, continuation of the same number of open area DAS and trip allocations under SQ alternative would results in higher landings, revenues and economic benefits in the short-term (2011-2012), but lower landings, revenues and economic benefits in the long-term (2013-2022) compared to the proposed action.

Table 86. Cumulative present value of estimated benefits (Million $, Inflation adjusted values discounted at 3%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of scallop revenue**	627.4	841.9	791.5	785	757.9
	Difference from No Action		214.6	164.1	157.7	130.6
	Difference from SQ	-214.5	0	-50.4	-56.9	-84
	PV of producer surplus	573	773.9	728.9	722.4	696.9
	PV of consumer surplus	26.9	36.8	34.1	33.6	35.2
	PV of total economic benefits	600	810.7	763	756	732.1
	Difference from No Action		210.7	163	156	132.2
	Difference from SQ	-210.7	0	-47.7	-54.7	-78.6
2013-2022	**PV of scallop revenue**	3339.2	3223.6	3307.5	3261	3242.2
	Difference from No Action		-115.6	-31.7	-78.2	-97
	Difference from SQ	115.6	0	83.9	37.4	18.6
	PV of producer surplus	3067.1	2959.5	3037.7	2994	2976.1
	PV of consumer surplus	154	150.7	156.8	154.4	154.3
	PV of total economic benefits	3221.1	3110.1	3194.5	3148.4	3130.4
	Difference from No Action		-111	-26.6	-72.7	-90.7
	Difference from SQ	111	0	84.4	38.3	20.3
2011-2022						
PV of scallop revenue		3966.6	4065.5	4099	4046	4000.1
	Difference from No Action		99	132.5	79.4	33.6
	Difference from SQ	-98.9	0	33.5	-19.5	-65.4
PV of producer surplus		3640.2	3733.3	3766.6	3716.4	3673
PV of consumer surplus		180.9	187.5	191	188	189.5
PV of total economic benefits		3821	3920.8	3957.5	3904.3	3862.5
	Difference from No Action		99.8	136.5	83.3	41.5
	Difference from SQ	-99.8	0	36.7	-16.5	-58.3

Table 87. Cumulative present value of estimated benefits (Million $, Inflation adjusted values discounted at 7%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of scallop revenue**	594.1	795.3	747.4	741.5	715.4
	Difference from No Action		201.2	153.3	147.4	121.3
	Difference from SQ	-201.2		-47.9	-53.8	-80.0
	PV of producer surplus	542.6	731.0	688.3	682.3	657.7
	PV of consumer surplus	25.5	34.7	32.2	31.7	33.2
	PV of total economic benefits	568.1	765.7	720.4	714.0	691.0
	Difference from No Action		197.7	152.4	145.9	122.9
	Difference from SQ	-197.7		-45.3	-51.8	-74.8
2013-2022	**PV of scallop revenue**	2549.7	2451.5	2519.2	2480.7	2479.2
	Difference from No Action		-98.2	-30.5	-69.1	-70.5
	Difference from SQ	98.2		67.7	29.2	27.7
	PV of producer surplus	2341.9	2250.6	2313.7	2277.6	2275.8
	PV of consumer surplus	154.0	150.7	156.8	154.4	154.3
	PV of total economic benefits	2459.7	2365.2	2433.4	2395.3	2394.3
	Difference from No Action		-94.4	-26.3	-64.4	-65.4
	Difference from SQ	94.4		68.1	30.1	29.1
2011-2022						
PV of scallop revenue		3143.8	3246.8	3266.6	3222.1	3194.6
	Difference from No Action		103.0	122.8	78.4	50.8
	Difference from SQ	-103.0		19.8	-24.6	-52.2
PV of producer surplus		2884.5	2981.6	3001.9	2959.9	2933.5
PV of consumer surplus		180.9	187.5	191.0	188.0	189.5
PV of total economic benefits		3027.7	3131.0	3153.8	3109.3	3085.3
	Difference from No Action		103.2	126.1	81.5	57.5
	Difference from SQ	-103.2		22.8	-21.7	-45.7

The following sections describes the detailed results of the proposed options on landings, meat count, LPUE, effort, prices, revenues and total economic benefits.

5.4.3.3 Specifications for 2013

The projections for the proposed action (alt1) suggest that specifications for 2013 should be 4 access area trips and 35 open area DAS (Table 14). ACL related values for this fishing year are presented in Table 4, but are expected to change in future actions when final specifications are set for FY2013 and 2014. When the Committee reviewed the default allocations for 2013, they suggested that open area DAS should be 75% of the projection (26 DAS) to be precautionary, and the Council agreed. Estimates are less certain the further out they are and it is easier to allocate more DAS in the subsequent framework that will be implemented after the fishing year starts, compared to taking DAS away. The DAS allocation for this default year is not expected to be the final allocation for FY2013, but in the event that Framework 24 is delayed and measures are not in place at the beginning of FY2013, these measures will serve as a default.

This measure is expected to have potentially positive economic impacts. If the resource conditions turns out to be less favorable in 2013 than suggested by the biological projections, instead of rolling over 36 DAS until the new Framework is implemented, this measure would allocate only 26 DAS to prevent potentially negative impacts on the resource, scallop yield, thus on the economic benefits from the scallop fishery. This will also reduce the administrative burdens associated with late implementation of frameworks.

5.4.3.4 Allocation of split trips and the lottery system

This action also includes a lottery system for the allocation of split trips. The Scallop Committee and Council identified this as the preferred strategy so vessels were treated equally. The administration of the lottery is expected to have positive economic impacts on the fishermen since it will provide flexibility for the vessels to trade access area trips, thus to use fully the access area trip allocations. The allocations of split (half) trips to access areas with biomass levels not large enough to support a full trip will increase landings, revenues and total economic benefits from the fishery.

5.4.3.5 Impacts of Framework 22 alternatives on landings, meat count and LPUE

The proposed action (Alt1) would result in larger landings compared to Alt2 and Schcl both in the short-term (2011-2012) and in the long-term (Table 88). It would also result in a more stable stream of landings compared to Alternative 2 (Alt2) and Great South Channel closure alternative (Schcl). The difference between the maximum and minimum amount of landings during 2011-2022 is 7.1 million lb. for Alt1, 9.4 million lb. for Alt2 and 10.1 million lb. for Schcl. Status quo allocations would result in higher landings in the short-term, but starting in 2013 it will result in lower landings compared to the proposed action and other alternatives. Because no action would allocate one less access area trip, the landings with no action would be less than 48 million lb in 2011 and less than 40 million lb. in 2012. Over the period 2013-2022, no action landings would higher than the landings for the proposed action and other alternatives. For the overall long-term period from 2011 to 2012, however, landings for the proposed action are estimated to exceed the levels for the no action by about 20 million lb., landings for the status quo by 7 million, landings for Alt2 by 8 million and landings for Schcl by 18 million lb. This is because the proposed action would result in a higher LPUE in the first two years (2011-2012) compared to the other alternatives and in either similar or higher levels of LPUE over the long-term period 2013-2022 (Table 89). The average meat counts would be slightly lower for the proposed action and more U10-20’s would be landed during 2011-2012 compared to other alternatives except for under SQ and Schcl alternatives there will be more U10-20’s landed (Table 90, Table 91). Over the long-term from 2011-2022, average meat counts and composition of landings would be similar under the proposed action and alternatives.

Table 88. Estimated Landings (million lbs)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	48.1	57.0	**52.3**	52.4	**48.8**
2012	**39.2**	**59.8**	57.2	56.0	56.8
2011-2012	87.3	116.8	109.5	108.4	105.7
2013	57.4	**49.2**	52.3	51.0	58.0
2014	55.0	53.5	55.6	55.0	**58.9**
2015	57.4	54.0	56.1	55.2	53.8
2016	51.4	50.1	52.0	**50.1**	48.7
2017	**58.8**	56.7	58.0	56.6	54.9
2018	57.8	55.9	57.0	55.5	54.4
2019	51.5	51.8	53.3	51.0	50.4
2020	57.9	58.6	**59.4**	**59.5**	56.7
2021	56.6	57.1	57.3	58.7	54.9
2022	52.2	52.2	52.7	53.6	50.5
2013-2022	556.0	539.1	553.5	546.3	541.3
Grand Total	643.3	656.0	663.1	654.7	646.9
Maximum difference in landings (million lbs) in 2012-2022	19.6	10.7	7.1	9.4	10.1

Table 89. Estimated average LPUE in all areas

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	2401	2590	2642	2602	2632
2012	2548	2664	2709	2694	2658
2013	2573	2588	2627	2608	2678
2014	2672	2659	2691	2689	2686
2015	2663	2627	2648	2652	2603
2016	2597	2591	2612	2593	2574
2017	2657	2643	2650	2639	2617
2018	2651	2610	2620	2608	2600
2019	2604	2593	2602	2579	2589
2020	2658	2653	2662	2651	2648
2021	2629	2626	2630	2630	2613
2022	2607	2601	2606	2606	2589

Table 90. Average Meat Count

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	18.4	18.4	18.4	18.4	16.6
2012	17.4	17.8	17.6	17.4	18.3
2013	18.0	17.7	17.5	17.4	18.0
2014	18.0	17.8	17.7	17.6	17.7
2015	18.2	18.1	17.8	17.8	17.7
2016	18.2	18.2	18.0	18.1	17.7
2017	18.2	18.3	18.2	18.2	17.7
2018	18.2	18.3	18.3	18.3	17.7
2019	18.3	18.3	18.3	18.4	17.7
2020	18.3	18.4	18.3	18.4	17.7
2021	18.3	18.4	18.3	18.4	17.8
2022	18.3	18.4	18.3	18.4	17.7

Table 91. Composition of landings by size category – Average lbs. by period (million lbs)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	Average of L-U10	2	6	6	6	6
	Average of L-1020	29	38	36	35	37
	Average of L-2030	11	13	11	11	8
	Average of L-3040	2	2	2	2	1
2013-2022	Average of L-U10	4	4	4	4	4
	Average of L-1020	38	38	39	38	38
	Average of L-2030	11	11	11	11	11
	Average of L-3040	2	2	2	2	2
2011-2022: Total Average of L-U10		4	4	4	4	4
2011-2022: Total Average of L-1020		37	38	38	38	38
2011-2022: Total Average of L-2030		11	11	11	11	10
2011-2022: Total Average of L-3040		2	2	2	2	2

5.4.3.6 Impacts of Framework 22 alternatives on prices, revenues

Prices are estimated using the ex-vessel price model described included shown in Appendix III of this document. This model takes into account the impacts of changes in meat count, domestic landings, exports, import prices, income of consumers, and composition of landings by market category (i.e., size of scallops) including a price premium on under count 10 scallops. The price estimates shown in Table 92 correspond to the price model outputs assuming that the import prices will be constant at their 2009 levels (given that 2009 trade data is not complete yet), scallop exports will constitute 45% of the domestic landings, and the disposable income in 2010 will be slightly higher (about 1.19% according to the latest statistics) than the levels in 2008.

It must be cautioned, however, that actual prices could be higher (lower) than these price estimates depending on the future values of the exogenous factors that determine domestic ex-vessel prices. An increase (or decrease) in future disposable income, inflation rate, in the premium for large scallops, in exports or in import prices could result in higher (or lower) prices estimated in Table 92. For example, it seems that the actual annual average prices (about $7.85 per pound) will be higher than estimated in Framework 21 ($7.27). The decrease in the value of dollar and increase in the landings of larger scallops stimulating the export demand for the US scallops and the problems with the Japanese scallop industry are some of the factors behind this difference between the actual and estimated values. Although the absolute values for revenues, producer and consumer surpluses, and total economic benefits would change with the value of estimated prices, the percentage differences of these values for the proposed action and other alternatives relative to the no action alternative would not change in any significant way. Higher prices than estimated in Table 92 will increase the short-term impact of the proposed action on revenues compared to no action, while lower prices reduce this impact. The long-term benefits will be greater with higher prices and smaller with lower prices, however.

Table 92. Estimated ex-vessel price per pound of scallops (inflation adjusted in 2010 constant prices)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	7.58	7.60	7.64	7.67	7.63
2012	7.40	7.47	7.48	7.47	7.40
2013	7.40	7.41	7.37	7.35	7.29
2014	7.42	7.44	7.41	7.40	7.38
2015	7.49	7.45	7.44	7.44	7.46
2016	7.48	7.47	7.46	7.44	7.49
2017	7.47	7.47	7.46	7.47	7.47
2018	7.46	7.44	7.43	7.45	7.44
2019	7.46	7.47	7.46	7.47	7.46
2020	7.50	7.48	7.47	7.48	7.47
2021	7.48	7.44	7.43	7.44	7.45
2022	7.48	7.48	7.47	7.45	7.50

The proposed action (Alt1) would result in larger revenue compared Alt2 and Schl both in the short- and in the long-term (Table 88). The sum of scallop revenue is estimated to be $827.7 million for 2011-2012 and exceed the sum of revenue for Alt2 by about $7 million and sum of revenue for Schcl by about $15 million. It would also result in a more stable annual stream of revenue compared to Alternative 2 (Alt2) and Great South Channel closure alternative (Schcl). The revenues for the proposed action in 2011 ($399.3 million) will exceed the actual revenues in 2009 ($379.5 million), but will be lower than the estimated revenues in 2010 ($431 million, Table 93). This is because, with lower DAS allocations (32 versus 38 in 2010), the landings for the proposed action is estimated to be 52.3 million in 2011. It must be cautioned that actual landings, prices and revenues could be different than estimated in Framework 22. For example, Framework 21 estimated that the landings would be about 47 million lb. for the 2010, about 10 million lb. less than landings in 2009 (57 million lb.). But because of the underestimation of the LPUE, the actual landings turned out to be 54 million lb. in 2010 and because the prices increased more than expected, actual revenue in 2010 exceeded 2009 levels by more than $50 million. Therefore, for the consistency of the results the predicted values for the proposed action should be compared with the predicted values for the no action and status quo alternatives.

The economic impacts of the proposed action are compared with the no action alternative to be consistent with the definition provided in Section 2.2.1 and with Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007). The estimated revenue for the no action alternative would be quite lower compared to the Status quo and the proposed alternatives. One reason for this is that the regulations would allow only 3 access area trip allocations in 2012, one less than allocated under the proposed action and the other alternatives. Another reason is that, under no action, two access area trips would be allocated to the Elephant Trunk area (ETA) in 2011-2012 as scheduled in 2010, but the scallop biomass in that area would be too low to support these trips. Therefore, scallop landings from this area would fall short of allocated pounds, and total access area trips would in fact be less than 3 trips in both 2011-2012. In short, landings, revenues and economic benefits with the no action would be much lower than the levels for the proposed alternatives simply because landings from the access areas would be less compared to the proposed action and other alternatives. Although more DAS would be allocated for the open areas with no action, LPUE from these areas are expected to be lower than the LPUE in access areas, resulting in lower overall landings compared to the level of landings when allocations are made for the most productive areas with the proposed action and other alternatives. As a result, landings, revenues and total economic benefits of the proposed action and the alternatives will exceed the levels for the no action.

In addition to the no action alternative, the results for the proposed action and alternatives are compared with the SQ alternative to show the results when DAS and access area trip allocations were set at exactly the same values as in 2010 (i.e., 38 full-time DAS and 4 trips). Since the main difference with this alternative and the proposed action is in the number of open area DAS allocations (38 DAS for SQ versus 32 DAS for Alt1), this comparison would show the short and the long-term impacts of changes in the open area DAS allocations from their values in 2010. It should be noted, however, that the status quo allocations would result in F rates which are above the target F. Thus, this alternative is not a feasible option and is included here only for the analytical purposes. Table 93 indicates that in 2011-2012, SQ allocations would result in highest revenues compared to all alternatives, but starting in 2013, it will result in lower landings compared to the proposed action and other alternatives including the no action. As a result, total revenues (undiscounted) over the long-term for the proposed action (Alt1) will exceed the revenues for the SQ alternative.

Table 93. Estimated Revenues ($ million, in inflation adjusted 2010 prices, undiscounted values) 2009 revenues=$379.5 million, estimated revenues for 2010= $431 million

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	364.5	433.4	**399.3**	402.1	**372.5**
2012	**290.2**	**446.8**	428.4	418.7	420.5
2011-2012	654.6	880.2	827.7	820.8	792.9
2013	424.9	**364.2**	385.2	374.9	422.8
2014	408.0	397.5	412.2	407.5	**434.7**
2015	430.4	402.5	417.3	410.9	401.3
2016	384.6	374.6	387.8	**373.0**	364.9
2017	**439.1**	423.4	432.8	422.7	410.7
2018	430.8	416.2	423.2	413.7	404.6
2019	384.5	387.0	397.5	381.2	376.0
2020	433.8	438.5	**443.6**	**444.7**	423.3
2021	423.6	425.2	425.7	436.5	408.9
2022	390.5	389.9	393.3	399.8	378.4
2013-2022	4150.2	4018.8	4118.6	4064.8	4025.6
Grand Total	4804.8	4899.1	4946.3	4885.6	4818.5
Maximum difference in revenues (million lbs) in 2012-2022	148.9	82.6	44.3	71.7	62.2

The guidelines for the economic analysis suggest that changes in net benefits are measured by the difference in the present value of the discounted stream of net benefits of regulatory action as compared to the status quo or no action. Discounting the future benefits would lower the long-term benefits and the benefits of the alternatives that result in lower landings in the short-term but higher landings in the long-term. The results of the economic analyses are similar, however, to the results when comparison is made using the undiscounted revenues above in Table 93.

Table 94 and Table 95 indicate that the estimated revenues will be about $164.1 ($153.3) million higher in 2011-2012 with the proposed action compared to the no action, but will be $50.4 million ($47.9 million) lower than the SQ alternative at 3% discount rate (at 7% discount rate). As was explained above, this is because of the lower access area allocations and landings with the no action and higher open area DAS allocation with the SQ alternative than for the proposed action (Alt1), and for alternatives Alt2 and Schcl.

There are trade-offs between the short-term and the long-term benefits, however. Because under no action fewer scallops were landed in 2011-2012, more would be landed over the long-term 2013-2022 resulting in higher revenues under the no action alternative for 2013-2022 compared to the proposed action and other alternatives (Table 88). Still, higher revenues for the proposed action and other alternatives in 2011-2012 more than offset lower revenues in 2013-2022 compared to the levels for no action. As a result, overall revenues for proposed action (Alt1) are expected to exceed the no action revenues by $122.8 million (Table 93, discounted at 7%) to $132.5 million (Table 94, discounted at 7%) for the overall period from 2011 to 2022. Similarly, revenues for Alt2 would exceed no action revenues by $78.4 million to $79.4 million, and the revenues for Schcl would exceed no action revenues by $33.6 million to $50.8 million depending on the discount rate (Table 94 and Table 95).

The long-term results are opposite when the revenues for the proposed action and alternatives are compared with the SQ alternative. Because more scallops would be landed with SQ in the short-term compared to the other alternatives, there would be fewer scallops to land over the long-term with SQ compared to the proposed action (Table 88). As a result, cumulative present values of the proposed action (Alt1) will exceed revenues for SQ both in 2013-2020 (by $67.7 million) and in 2011-2022 ((by $19.8 million) using a 7% discount rate (Table 94) and by more than these amounts using a 3% discount rate (Table 95) The revenues for the other alternatives Alt2 and Schcl, however, will fall short of the SQ revenues both in the short- (2011-2012) and the long-term (2011-2022).

In conclusion, the proposed action (Alt1) results in the largest revenues both in the short- and the long-term compared to no action and other alternatives. Although in the short-term, revenues for the SQ alternative would be higher than for the proposed action levels, in the long-term, it would be lower than the revenues for the proposed action.

Table 94. Cumulative present value of estimated revenues (Million $, Inflation adjusted values discounted at 7%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of scallop revenue**	594.1	795.3	747.4	741.5	715.4
	Difference from No Action		201.2	153.3	147.4	121.3
	Difference from SQ	-201.2		-47.9	-53.8	-80.0
2013-2022	**PV of scallop revenue**	2549.7	2451.5	2519.2	2480.7	2479.2
	Difference from No Action		-98.2	-30.5	-69.1	-70.5
	Difference from SQ	98.2		67.7	29.2	27.7
2011-2022	PV of scallop revenue	3143.8	3246.8	3266.6	3222.1	3194.6
	Difference from No Action		103.0	122.8	78.4	50.8
	Difference from SQ	-103.0		19.8	-24.6	-52.2

Table 95. Cumulative present value of estimated revenues (Million $, Inflation adjusted values discounted at 3%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of scallop revenue**	627.4	841.9	791.5	785.0	757.9
	Difference from No Action		214.6	164.1	157.7	130.6
	Difference from SQ	-214.6		-50.4	-56.9	-84.0
2013-2022	**PV of scallop revenue**	3339.2	3223.6	3307.5	3261.0	3242.2
	Difference from No Action		-115.6	-31.7	-78.2	-97.0
	Difference from SQ	115.6		83.9	37.3	18.6
2011-2022	PV of scallop revenue	3966.6	4065.5	4099.0	4046.0	4000.1
	Difference from No Action		99.0	132.5	79.4	33.6
	Difference from SQ	-99.0		33.5	-19.5	-65.4

5.4.3.7 Impacts of Framework 22 alternatives on DAS, fishing costs and open area days and employment

Table 96 shows open area DAS per full-time vessel for each alternative and fishing year and Table 97 show total fleet DAS from all areas. Total effort measured in terms of DAS used as a sum total of all areas is expected to be smaller in 2011-2012 for the proposed action (total 40,917 DAS for the two years) compared to SQ alternative (44,469 DAS) and Alt2 (40,944 DAS) but higher than the DAS for the no action (35,424 DAS) and Schcl alternative (39,930, Table 97). The difference from the no action DAS used amounts to a 16% increase for the proposed action (alt1) and Alt2, and 13% increase for the Schcl option (Table 97). As a result, employment as measured by crew-days will change in the same percentage change to the DAS used and would increase as compared to the no action levels in the short-term (2011-2012).

As compared the SQ alternative, which is more in line with the recent conditions in the scallop fishery, the overall DAS used will decline by 8% for the proposed action (Alt1) and for Alt2 and by 10% for Schcl because these alternatives would allocate less open area DAS compared to 2010 (SQ alternative). Although it is uncertain to what extent the reduction in crew-days will result in a reduction in the number of crew given that this reduction is mostly limited to 2011-2012 and that DAS-used are expected to increase in the following years, the vessel owners may prefer to employ same crew for less fishing days.

Table 97 shows that this trend in DAS-used (thus on crew-days) will be reversed in the future years. Starting in 2013, the DAS used will be slightly higher for the proposed action compared to SQ levels, but will be less than the no action levels. For the overall period from 2011-2022, total DAS-used for the proposed action (thus crew-days) will be about 2% higher than the no action levels, but would be about the same as the SQ levels. The DAS-used for NCLF20 will be slightly lower than the no action but higher than the proposed action levels. DAS-used for the new closure alternatives (CLF20 and CLF18) will exceed the “No Action” levels by 2% to 3%. The overall DAS-use, thus crew*days will also be higher than the levels for Alt2 and Schcl options.

Total trip costs for the fleet vary with the total DAS-used for each alternative. Table 98 sows that undiscounted annual values of the trips costs are quite similar for the proposed action (Alt1), Alt2 and Schcl both in the short-term (2011-2012) ant the long-term (2013-2022). No action would result in the lowest trip costs in the short-term but highest costs in the long-term, while SQ alternative would result in the highest trip costs in the short-term but lowest costs in the long-term. Present value of the fleet costs are summarized and compared with no action and SQ alternatives in Table 99 using a discount rate of 7% and in Table 100 using a discount rate of 3%. Because of lower DAS used, the present value of the trip costs for the proposed action ($59.1 million) will be lower compared to the costs with status quo ($64.3million), almost the same as for Alt2 ($59.2 million) but will be higher compared to costs with the Schcl alternative ($57.6 million) and no action ($51.5 million) in 2011-2012 (Table 99, 7% discount rate). For the long-term period from 2011 to 2022, the cumulative present value of the trip costs for the proposed action ($264.7 million) will be slightly lower than the costs for status quo ($265.2 million), but will be slightly higher compared to costs for Alt2 (264.7 million) and Schcl ($261 million) and will be about $5.6 million higher than the no action values ($259.3 million, Table 99, 7%

discount rate). Table 100 shows the corresponding values by using a 3% discount rate to calculate the cumulative present value of the fleet costs with similar comparative results.

Table 96. Estimated Open Area DAS per FT vessel

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	38	38	32	32	22
2012	38	38	34	35	23
2011-2012	76	76	66	67	45
2013	32	33	35	35	25
2014	32	32	34	34	27
2015	49	48	50	49	29
2016	50	49	50	49	48
2017	50	49	51	49	49
2018	50	50	51	49	49
2019	49	50	51	50	48
2020	49	50	51	51	48
2021	49	50	51	51	48
2022	50	50	50	51	48
2013-2022	460	461	474	468	419
Grand Total	536	537	540	535	464

Table 97. Estimated Total DAS-used in all areas

Period	Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	2011	20,024	22,008	19,790	20,148	18,553
	2012	15,400	22,461	21,127	20,796	21,377
2011-2012 Total		35,424	44,469	40,917	40,944	39,930
	% change from No Action	0%	26%	16%	16%	13%
	% change from SQ	-20%	0%	-8%	-8%	-10%
2013-2022	2013	22,306	19,004	19,900	19,554	21,673
	2014	20,574	20,100	20,671	20,465	21,937
	2015	21,567	20,554	21,174	20,811	20,666
	2016	19,806	19,353	19,912	19,323	18,938
	2017	22,135	21,448	21,902	21,445	20,998
	2018	21,791	21,422	21,737	21,294	20,924
	2019	19,782	19,991	20,474	19,784	19,456
	2020	21,764	22,106	22,316	22,428	21,398
	2021	21,545	21,765	21,767	22,315	21,012
	2022	20,016	20,053	20,204	20,580	19,501
2013-2022 Total		211,286	205,796	210,057	207,999	206,503
2011-2022 Total		246,710	250,265	250,974	248,943	246,433
	% change from No Action	0%	1%	2%	1%	0%
	% change from SQ	-1%	0%	0%	-1%	-2%

Table 98. Estimated fleet trip costs in all areas ($ million, in 2010 values)

Period	Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	2011	32.0	35.2	31.7	32.2	29.7
	2012	24.6	35.9	33.8	33.3	34.2
2011-2012 Total		56.7	71.2	65.5	65.5	63.9
2013-2022	2013	35.7	30.4	31.8	31.3	34.7
	2014	32.9	32.2	33.1	32.7	35.1
	2015	34.5	32.9	33.9	33.3	33.1
	2016	31.7	31.0	31.9	30.9	30.3
	2017	35.4	34.3	35.0	34.3	33.6
	2018	34.9	34.3	34.8	34.1	33.5
	2019	31.7	32.0	32.8	31.7	31.1
	2020	34.8	35.4	35.7	35.9	34.2
	2021	34.5	34.8	34.8	35.7	33.6
	2022	32.0	32.1	32.3	32.9	31.2
2013-2022 Total		338.1	329.3	336.1	332.8	330.4

Table 99. Cumulative present value of estimated trip costs (Million $, Inflation adjusted values discounted at 7%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of trip costs**	51.5	64.3	59.1	59.2	57.6
	Difference from No Action		12.8	7.7	7.7	6.2
	Difference from SQ	-12.8		-5.2	-5.1	-6.7
2013-2022	**PV of trip costs**	207.8	200.9	205.5	203.1	203.4
	Difference from No Action		-6.9	-2.3	-4.7	-4.4
	Difference from SQ	6.9		4.6	2.2	2.5
2011-2022	**PV of trip costs**	259.3	265.2	264.7	262.3	261.0
	Difference from No Action		5.9	5.4	3.0	1.7
	Difference from SQ	-5.9		-0.6	-2.9	-4.2

Table 100. Cumulative present value of estimated trip costs (Million $, Inflation adjusted values discounted at 3%)

Period	Data	No Action	SQ	Proposed action (Alt1)	Alt2	Schcl
2011-2012	**PV of trip costs**	54.3	68.1	62.6	62.7	61.1
	Difference from No Action		13.7	8.3	8.3	6.7
	Difference from SQ	-13.7		-5.5	-5.4	-7.0
2013-2022	**PV of trip costs**	272.1	264.2	269.9	267.0	266.1
	Difference from No Action		-7.9	-2.2	-5.1	-6.0
	Difference from SQ	7.9		5.7	2.8	1.9
2011-2022	**PV of trip costs**	326.4	332.2	332.5	329.6	327.1
	Difference from No Action		5.8	6.1	3.2	0.7
	Difference from SQ	-5.8		0.3	-2.6	-5.1

5.4.3.8 Impacts of Framework 22 alternatives on producer surplus

Producer surplus (benefits) for a particular fishery shows the net benefits to harvesters, including vessel owners and crew, and is measured by the difference between total revenue and operating costs (Appendix III). Annual values of the producer surplus are expected to range from $353 million (2013) to $407.9 million (2020) and the undiscounted value of exceed the producer surplus for all the alternatives over the long-term (2011-2022) including the no action and SQ levels (Table 101).

There are trade-offs between the short-term and the long-term benefits, however. The estimated producer surplus will be about $155.9 million higher in 2011-2012 with the proposed action compared to the no action, but will be $45.0 million lower compared to the values for SQ alternative (Table 102, 3% discount rate). Still, higher producer surplus in 2011-2012 are expected to more than offset lower producer surplus in 2013-2022 compared to the levels for no action. As a result, overall producer surplus for proposed action (Alt1) is expected to exceed the no action levels by $126.4 million for the overall period from 2011 to 2022.

Similarly, producer surplus for Alt2 would exceed no action levels by $149.4 (by $76.2) million and the producer surplus for Schcl would exceed no action levels by $123.9 (by $32.3) million in 2011-2012 (in the long-term during 2011-2022). The proposed action will result in higher producer surplus compared to Alt2 and Schl alternatives both in the short and the long-term (Table 102), however.

The short-versus long-term results are opposite when the producer surplus for the proposed action and alternatives are compared with the SQ alternative. Because more scallops would be landed with SQ in the short-term compared to the other alternatives, there would be fewer scallops to land over the long-term was shown by the landings estimates in Table 88 above. As a result, overall producer surplus for the proposed action (Alt1) will be lower (by 45 million) in the short-term, but will exceed levels for SQ by $78.2 million in 2013-2020 and by $33.2 million in 2011-2022 (Table 102). The producer surplus for the other alternatives Alt2 and Schcl, however, will fall short of the SQ levels both in the short-term (2011-2012) and in the long-term (2011-2022). Table 103 shows the corresponding values by using a 7% discount rate to calculate the cumulative present value of the producer surplus with similar comparative results.

In conclusion, the proposed action (Alt1) results in the largest producer surplus both in the short- and the long-term compared to no action and other alternatives. Although in the short-term, producer surplus for the SQ alternative would be higher than the proposed action levels, in the long-term, it would result in lower producer surplus compared to the proposed action levels.

Table 101 - Estimated Producer surplus ($ million, in inflation adjusted 2010 prices, undiscounted values)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	332.4	398.2	367.6	369.8	342.8
2012	265.5	410.8	394.6	385.4	386.2
2011-2012	597.9	809.1	762.3	755.3	729.0
2013	389.2	333.8	353.3	343.6	388.1
2014	375.1	365.3	379.1	374.7	399.6
2015	395.9	369.6	383.4	377.6	368.2
2016	352.9	343.6	355.9	342.1	334.6
2017	403.7	389.0	397.8	388.3	377.1
2018	396.0	381.9	388.4	379.6	371.1
2019	352.9	355.0	364.8	349.5	344.8
2020	398.9	403.1	407.9	408.8	389.1
2021	389.1	390.4	390.9	400.8	375.3
2022	358.5	357.8	361.0	366.9	347.2
2013-2022	3812.2	3689.6	3782.5	3732.0	3695.2
Grand Total	4410.1	4498.6	4544.7	4487.3	4424.2

Table 102. Short and long-term cumulative present value of producer surplus (million $, in 2010 inflation-adjusted prices, discount rate of 3%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of producer surplus	573.0	773.9	728.9	722.4	696.9
	Difference from No Action		200.9	155.9	149.4	123.9
	Difference from SQ	-200.9		-45.0	-51.5	-77.0
2013-2022	PV of producer surplus	3067.1	2959.5	3037.7	2994.0	2976.1
	Difference from No Action		-107.7	-29.5	-73.2	-91.0
	Difference from SQ	107.7		78.2	34.5	16.6
2011-2022	PV of producer surplus	3640.2	3733.3	3766.6	3716.4	3673.0
	Difference from No Action		93.2	126.4	76.2	32.8
	Difference from SQ	-93.2		33.2	-17.0	-60.3

Table 103. Short and long-term cumulative present value of producer surplus (million $, in 2010 inflation-adjusted prices, discount rate of 7%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of producer surplus	542.6	731.0	688.3	682.3	657.7
	Difference from No Action		188.4	145.7	139.7	115.1
	Difference from SQ	-188.4		-42.8	-48.7	-73.3
2013-2022	PV of producer surplus	2341.9	2250.6	2313.7	2277.6	2275.8
	Difference from No Action		-91.3	-28.2	-64.3	-66.1
	Difference from SQ	91.3		63.1	27.0	25.3
2011-2022	PV of producer surplus	2884.5	2981.6	3001.9	2959.9	2933.5
	Difference from No Action		97.1	117.4	75.4	49.1
	Difference from SQ	-97.1		20.4	-21.7	-48.0

5.4.3.9 Impacts of Framework 22 alternatives on consumer surplus

Consumer surplus for a particular fishery is the net benefit that consumers gain from consuming fish based on the price they would be willing to pay for them. Consumer surplus will increase when fish prices decline and/or the amount of fish harvested goes up. Annual values of the consumer surplus (undiscounted) are shown in Table 104, and the cumulative present values are summarized in Table 105 (3% discount rate) and Table 106 (7% discount rate).

In the short-term (2011-2012), the consumer benefits for the proposed action (Alt1), for Alt2 and Schcl will exceed the no action levels but will be lower than the benefits for the SQ alternative (Table 105 and Table 106). Over the long-term period from 2011 to 2022 however, the proposed action and the alternative options will have higher consumer surplus compared to both the no action and SQ levels. The proposed action will increase consumer benefits by about $7.2 million in the short-term (2011-2012) and by about $10.1 million in the long-term (2011-2022) compared to no action using a 3% discount rate (Table 105) and by slightly lower amounts if a 7% discount rate used to calculate the present values of the consumer benefits. The proposed action is estimated to increase in the consumer benefits compared to SQ levels as well slightly by $3.5 million over the long-term using a 3% discount rate and by $2.5 million using a 7% discount rate. The proposed action will also result in slightly larger consumer benefits in the long-term compared to other alternatives Alt2 and Schcl (Table 105 and Table 106)

Table 104. Estimated Consumer surplus ($ million, in inflation adjusted 2010 prices, undiscounted values)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	14.4	17.6	15.9	15.6	16.2
2012	13.8	20.9	19.8	19.5	20.7
2011-2012	28.1	38.5	35.7	35.2	36.9
2013	20.5	17.5	19.2	18.9	22.8
2014	19.5	18.8	20.1	19.9	21.8
2015	19.3	18.8	19.7	19.5	18.5
2016	17.4	17.2	18.1	17.5	16.5
2017	20.2	19.7	20.4	19.7	18.9
2018	20.0	19.6	20.2	19.4	19.1
2019	17.7	17.9	18.4	17.5	17.4
2020	19.5	20.4	20.7	20.5	19.7
2021	19.2	20.1	20.3	20.7	19.2
2022	17.6	17.9	18.1	18.7	17.0
2013-2022	191.1	187.7	195.1	192.1	191.0
Grand Total	219.2	226.2	230.8	227.3	227.9

Table 105. Short and long-term cumulative present value of consumer surplus (million $, in 2010 inflation-adjusted prices, discount rate of 3%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of consumer surplus	26.9	36.8	34.1	33.6	35.2
	Difference from No Action		9.9	7.2	6.7	8.3
	Difference from SQ	-9.9		-2.7	-3.2	-1.6
2013-2022	PV of consumer surplus	154.0	150.7	156.8	154.4	154.3
	Difference from No Action		-3.3	2.9	0.5	0.3
	Difference from SQ	3.3		6.2	3.8	3.6
2011-2022	PV of consumer surplus	180.9	187.5	191.0	188.0	189.5
	Difference from No Action		6.6	10.1	7.1	8.6
	Difference from SQ	-6.6		3.5	0.5	2.1

Table 106. Short and long-term cumulative present value of consumer surplus (million $, in 2010 inflation-adjusted prices, discount rate of 7%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of consumer surplus	25.5	34.7	32.2	31.7	33.2
	Difference from No Action		9.3	6.7	6.2	7.8
	Difference from SQ	-9.3		-2.6	-3.1	-1.5
2013-2022	PV of consumer surplus	117.8	114.7	119.7	117.7	118.5
	Difference from No Action		-3.1	1.9	0.0	0.7
	Difference from SQ	3.1		5.0	3.1	3.8
2011-2022	PV of consumer surplus	143.2	149.4	151.8	149.4	151.7
	Difference from No Action		6.2	8.6	6.2	8.5
	Difference from SQ	-6.2		2.5	0.0	2.3

5.4.3.10 Impacts of Framework 22 alternatives on total economic benefits

Economic benefits include the benefits both to the consumers and to the fishing industry and equal the sum of benefits to the consumers and producers. Annual values of the total economic benefits (undiscounted) are shown in Table 107 and the cumulative present values are summarized in Table 108 (3% discount rate) and Table 109 (7% discount rate).

In the short-term (2011-2012), the total economic benefits for the proposed action (Alt1), for Alt2 and Schcl will exceed the no action levels but will be lower than the benefits for the SQ alternative (Table 108 and Table 109). Over the long-term period from 2011 to 2022 however, the proposed action will have higher economic benefits compared to both the no action and SQ levels. The proposed action will increase net national benefits by about $163.0 million in the short-term (2011-2012) and by about $136.5 million in the long-term (2011-2022) compared to no action (calculated using a 3% discount rate - Table 108) and by slightly lower amounts if a 7% discount rate used to calculate the present values of the total benefits. The proposed action is estimated to reduce the total economic benefits compared to SQ levels by $47.7 million in the short-term (2011-2012) and but increase the benefits by $36.7 million over the long-term (calculated at a 3% discount rate). The increase in benefits would be less if a more conservative (7% discount rate) were applied to calculate the present cumulative value of the economic benefits as shown in Table 109. The alternatives Alt2 and Schcl will result in lower economic benefits compared to SQ, but higher benefits compared to no action both in the short-term (2011-2012) and in the long-term (2011-2023). The proposed action will result in considerably larger total economic benefits ($136.5 million net of no action benefits) to the nation in the long-term compared to other alternatives Alt2 ($83.3 million a net of no action benefits) and Schcl ($41.5 million a net of no action benefits) as shown in Table 108. Again, Table 109 shows the corresponding values using a 7% discount rate to calculate the cumulative present value of the total economic benefits with similar comparative results for the proposed action and the alternatives.

Table 107. Estimated total benefits ($ million, in inflation adjusted 2010 prices, undiscounted values)

Fishing year	No Action	SQ	Alt1	Alt2	Schcl
2011	346.8	415.8	383.5	385.5	359.0
2012	279.3	431.8	414.4	405.0	407.0
2011-2012	626.1	847.6	798.0	790.4	765.9
2013	409.6	351.3	372.5	362.5	410.9
2014	394.6	384.2	399.1	394.6	421.4
2015	415.2	388.3	403.1	397.1	386.7
2016	370.3	360.8	374.0	359.5	351.0
2017	423.9	408.7	418.1	408.0	396.0
2018	416.0	401.5	408.5	399.1	390.2
2019	370.6	372.9	383.1	367.0	362.3
2020	418.4	423.5	428.7	429.3	408.8
2021	408.4	410.5	411.2	421.5	394.5
2022	376.1	375.7	379.1	385.6	364.2
2013-2022	4003.2	3877.3	3977.5	3924.1	3886.1
Grand Total	4629.3	4724.9	4775.5	4714.6	4652.1

Table 108. Short and long-term cumulative present value of total economic benefits (million $, in 2010 inflation-adjusted prices, discount rate of 3%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of total economic benefits	600.0	810.7	763.0	756.0	732.1
	Difference from No Action		210.7	163.0	156.0	132.2
	Difference from SQ	-210.7		-47.7	-54.7	-78.6
2013-2022	PV of total economic benefits	3221.1	3110.1	3194.5	3148.4	3130.4
	Difference from No Action		-111.0	-26.6	-72.7	-90.7
	Difference from SQ	111.0		84.4	38.3	20.3
2011-2022	PV of total economic benefits	3821.0	3920.8	3957.5	3904.3	3862.5
	Difference from No Action		99.8	136.5	83.3	41.5
	Difference from SQ	-99.8		36.7	-16.5	-58.3

Table 109. Short and long-term cumulative present value of total economic benefits (million $, in 2010 inflation-adjusted prices, discount rate of 7%)

Period	Data	No Action	SQ	Alt1	Alt2	Schcl
2011-2012	PV of total economic benefits	568.1	765.7	720.4	714.0	691.0
	Difference from No Action		197.7	152.4	145.9	122.9
	Difference from SQ	-197.7		-45.3	-51.8	-74.8
2013-2022	PV of total economic benefits	2459.7	2365.2	2433.4	2395.3	2394.3
	Difference from No Action		-94.4	-26.3	-64.4	-65.4
	Difference from SQ	94.4		68.1	30.1	29.1
2011-2022	PV of total economic benefits	3027.7	3131.0	3153.8	3109.3	3085.3
	Difference from No Action		103.2	126.1	81.5	57.5
	Difference from SQ	-103.2		22.8	-21.7	-45.7

5.4.4 Summary of additional measures for specific to limited access vessels

This framework includes the specific access area schedule and DAS allocations for all limited access scallop vessels. From the selected allocation alternative a specific DAS compensation value is calculated for open area DAS if a GB access area closes early due to the YT TAC being reached. Neither of the sections below are stand-alone alternatives for this action.

5.4.4.1 YT flounder bycatch TAC in access areas

The proposed allocation alternative, Alternative 1, includes measures related to the YT flounder bycatch which is specific for the limited access vessels. If the GB YT flounder bycatch TAC is reached in 2011 in or CAII, limited access vessels are permitted to use access area trips at a compensation rate in open areas. This process has been adopted by previous actions, but the specific DAS compensations values are set in each framework. Table 16 in Section 2.5.1.1 describes the various DAS compensation rates if one of the GB access areas close due to the YT TAC being reached. Since the compensation rates are determined by estimating an equivalent level of mortality, the overall impacts of this alternative on the scallop resource are expected to be neutral. For example, in Closed Area 1, a full trip is 18,000 lbs, and according to the projections for the proposed alternative (Alt 1), the average meat count in Closed Area I is estimated to be 10.6 meats per pound, implying that 18,000*10.6 = 190,800 scallops will be removed per trip. In the open areas, the average meat count is estimated to be 18.4 so that 190,800 scallops correspond to 190,800/10.6 = 10,370 pounds. The estimate of open area LPUE generated from the model for this alternative is 2441, so it will take 10370/2441 = 4.25 DAS to land the same number of scallops, resulting in compensation of 4.25 DAS.

There will be no change in the economic impacts as a result of this alternative since this measure is also the no action alternative. Although compensation for the lost pounds due to closure of the GB access areas will have a positive impact on vessels, the scallop pounds per trip could be lower than the allocated pounds for the access area trips due to the proration. In other words, this alternative will help to minimize loss in pounds and revenue due to the closure of access areas before a vessel takes its trip, without entirely compensating for the loss. Although the loss in landings and revenue due to the closure and proration of the open area trips cannot be predicted accurately at this time, in some cases the loss could be significant depending on the open area meat counts. In general, the higher the meat count in the open areas, the higher the catches from these trips, and the smaller will be the loss.

5.4.4.2 Review of yellowtail flounder accountability measures

The Council approved accountability measures for the GB and SNE yellowtail flounder sub-ACLs under Amendment 15 and the specific allocations were set in Multispecies Framework 45. If approved, the accountability measures adopted under Amendment 15 will apply in 2011 and beyond. This framework does not include any changes to those measures. If an ACL is exceeded during the 2011 fishing year, AMs will be triggered for FY2012, based on what is approved in Amendment 15, same for 2012 and 2013. A brief description of these measures and impacts have been summarized here in the event that these measures are adopted and are effective in 2011 any beyond when this action is in place.

The AM adopted by the Council includes a seasonal closure of a portion of the YT stock area pre-identified as having high bycatch, with the LAGC fishery exempted. Section 5.4.2.4 of Amendment 15 analyzed the economic impacts of this alternative. In general, this measure could increase fishing costs and have negative impacts on the scallop revenues and profits if the effort is moved to less productive areas with lower LPUE and to areas with a higher percentage of smaller scallops that are usually sold at a lower price compared to larger scallops. Implementation of the closure in the subsequent year, rather than in-season, will however prevent derby style fishing and minimize the negative impacts on prices and revenues associated with it. In general, pre-defined areas will close on March 1 in the subsequent year until a time determined by the PDT to account for the overage.

5.4.5 Measures for General category IFQ vessels

The limited access general category (LAGC) vessels will be allocated 5% of the total ACL and the limited access vessels with the IFQ permits will be allocated 0.5% of the ACL. All together they will also receive 5.5% of the TAC for each access area except for CAII (because most of these vessels can not access that area). These allocations are converted fleetwide maximum trip allocations for LAGC vessels by access area. These trips are accounted for in the biological projections and included in the cost-benefit analyses provided in Section 5.4.3 so will not have any additional impacts on the net economic benefits. If trips are not taken in these areas, LAGC catch is assumed to be taken in open areas instead. In general, catch rates are higher in access areas and many access areas are relatively close to shore, so it is assumed that most allocated trips will be taken. The economic impacts of the proposed measures for the limited access general category vessels are expected to be positive both in the short- and the long-term compared to the no action alternative since total ACL, thus the share of the LAGC will be higher than the no action values. The economic impacts will be positive compared to the recent levels in 2010 as well because Framework 21 estimated that total landings would be around 47 million lb. in 2010, and the TAC for the LAGC fishery was about 2.3 million lb. (5.0% of 47 million). Estimated landings for the proposed action is 52.3 million lb. in 2011 and landings are estimated to be 52 million lb. or over during 2012-2022. Thus the LAGC TAC will be around 3.1 million lb. in 2011 because of the new method ACL is estimated and because there is no buffer applied for the LAGC fishery. Therefore, revenues and economic benefits for the LAGC fishery with the proposed action will be higher than the levels in 2010.

5.4.6 NGOM and Incidental catch TAC

Proposed action includes a 70,000 pounds hard-TAC for the NGOM, which is equivalent to the "No Action" alternative as specified in the previous Framework action 21. Thus, the proposed action will not have additional economic impacts on the participants of the NGOM fishery. The alternative of 31,100 pounds is expected to reduce the change of excess fishing in federal waters in the NGOM based on results of the recent scallop survey of that area. The status quo alternative of 70,000 pounds increases that risk, but the PDT notes that a substantial portion of total catch from vessels with NGOM permits is coming from state waters, not included in updated 31,100 pound TAC. Neither alternative is expected to have substantial impacts on net economic benefits from the fishery since in recent years the catch levels have been below 20,000 pounds.

5.4.7 TAC set-asides for research and observers

Set-asides for observer coverage and research are now removed directly from the ABC for this fishery, rather than a percentage of what is allocated to the fishery for the specific access areas or of open area DAS. Amendment 15 included this revision as well as allocating a fixed poundage for RSA to be 1.25 million pounds. As discussed during the Amendment 15 process, making the RSA set-aside area specific can slow the awards process down if awards have to wait until a framework is implemented to allocate area specific pounds or DAS. If Amendment 15 is approved as the Council proposed, the research set-aside will be removed from the top equal to 1.25 million pounds, DAS will no longer be set aside for open areas, and catch will not be associated with specific areas. The cost benefit analyses take both of these set-asides into account before allocations are made so no additional direct impacts are expected on the net economic benefits. However, this process is expected to have indirect economic benefits on the sea scallop fishery by improving scallop management through better data and information made possible by timely research into current issues in the fishery.

5.4.8 Modifications to VMS

The proposed alternative is the no action without any changes to VMS. Alternative option would allow a vessel to turn VMS unit off if it does not intend to land scallops, thus it would reduce the costs of VMS for fishermen. However, allowing vessels to turn off their VMS units while at sea could compromise enforcement and cause more scallop mortality with potentially negative impacts on scallop yield and economic benefits from this fishery.

5.4.9 Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line

The proposed alternative is the no action. The alternative would reduce the possession limit seaward of the VMS demarcation line from 100 bu to something less (i.e. 65 or 75bu). The PDT reviewed seasonal/area meat weight data from the observer program for this alternative. Analyses support that a lower possession limit is warranted, but in light of the recent decision to increase the possession limit to 600 pounds, the PDT recommends that the possession limit stay at 100 bushels. This amount should provide some flexibility to account for seasonal and temporal changes in meat weight, but not high enough to increase incentive to shell stock or change fishing behavior. Therefore, the proposed action (no action) will not have any impacts on the economic benefits.

5.4.10 Extension of unused ETA trips through May 31, 2011

The proposed alternative is the no action according to which unused 2010 ETA trips will expire on February 28, 2011. The alternative would allow full-time vessels to use any unused FY 2010 ETA trips through May 31, 2011, a three month extension. Since catch rates are low in the ETA this extension would hopefully reduce negative impacts on the scallop resource by shifting trips that would be taken between now and February 28, 2010 until the spring of 2011 before May 31 when scallop meat weights are larger. This would reduce fishing mortality of remaining trips that have not been taken. Therefore, the alternative would have positive economic impacts on the scallop vessels compared to the no action. However, any catch after February 28, 2010 will count toward the 2011 ACL rather than the 2010 ACL. Since roughly 5 million pounds have not yet been harvested from this area, as of mid-October 2010, this extension could cause the 2011 ACL to be exceeded; having potentially negative consequences on the fishery in 2012 if AMs are triggered as a result of the ACL being exceeded.

5.4.11 Eliminate the Georges Bank closed area rotation schedule

The elimination of the rotation schedule and the opening and closing of access areas in the regulations will reduce confusion and administrative burden. Instead, access area schedules will be based solely on survey results and available exploitable biomass as assessed by the PDT and SSC, and approved by the Council. This will improve the management of the scallop resource with positive impacts on the scallop yield and on economic benefits from the scallop fishery.

5.4.12 Compliance with reasonable and prudent measure in recent biological opinion (section 2.8)

The economic impacts of the alternatives to comply with RPM on landings and revenues are provided in Section 5.1.7 of this document. The same section fully describes the model and the assumptions used in these analyses. It also provides a discussion of the potential economic impacts. The economic impacts of these alternatives will vary with the Framework 22 alternatives and the window of time in which the measures are applied.

The proposed action supports an RPM of one access area trip maximum in the Mid-Atlantic with no seasonal closures of Mid-Atlantic access areas. In addition, a caveat should be included that if someone trades in two additional Mid-Atlantic access area trips (to have four total), that vessel would be limited to taking two during the turtle window instead of one. The proposed action and the alternatives could have negative impacts on scallop prices and revenues and could result in higher fishing costs by removing effort from the more productive seasons when the meat weights are higher to seasons when the meat weight of scallops decline.

The proposed measures will lead to a change in the seasonal composition of landings and therefore could lead to a change in prices and revenues. In general, the reduction in landings during the turtle window is expected to increase prices during the period from July 15 to October 31, but expected to reduce prices for months outside of the turtle window. Whether the increase in scallop prices in the first period will offset the decrease in prices in the second period will depend on the magnitude of the shift, on the timing of the displaced effort and on the change in meat weight of scallops outside of the turtle window. If the shift in effort and landings comprise a small proportion of total effort and landings in the turtle window the impacts on prices will be low. Similarly if the displaced effort is distributed more or less evenly throughout the window it is shifted to, the impacts on prices will be small.

The proposed RPM measure, that is maximum one-trip alternative, is expected to shift about 1.9 million lb. of scallop landings during 2011-2012, or about 6.5%-7.2% of the total landings out of the turtle season (June 15 to October). Although, this is expected to increase the prices during the turtle season, it is unlikely for this shift to have a significant impact on the scallop prices for the overall year.

- The landings removed from the turtle season, about 1.9 million for the maximum-trip alternative, will be landed in the November – June 14 window. Since total landings from all areas without the RPM measures are expected to be about 26 million pounds in 2011 and 28 million lb. in 2012 during this period, shifting 1.9 million pounds would increase landings by 7.3% (2011) and by 6.7% (2012) outside the turtle window and would probably lower the price of scallops. Again, it is unlikely that this shift will reduce prices significantly during this period, especially if the displaced effort is distributed more or less evenly and if some vessels try to maximize their revenue by taking their trips during months when prices are relatively higher because of lower landings.
- Since the reduction in landings during the turtle window (7.2% for 2011) is about the same as the increase in landings (7.3%) outside of the turtle window, the percentage increase in prices could cancel out the percentage decline in prices outside the turtle window with little impacts on the average annual prices.
- The meat-weights will be slightly lower for the landings that are shifted out of the turtle window and this could have a negative impact on prices depending on when and where the effort removed from the turtle season will be used to fish for scallops. The larger scallops, U10s and U12s are sold at a significant price premium compared to the smaller size scallops and larger scallops caught more in summer months than the rest of the year (Table 77to Table 80 in Section 5.4.12). If effort is shifted to winter months, there will be less of U10s landed, and this could have some negative impacts on prices. Therefore, it is more likely that a higher percentage of effort will be shifted to the May – June 14 where meat weights are higher even compared to the turtle season. Given that in 2011, HC Canyon area will probably not open to fishing until the summer months of June to July, probably many DMV trips will be taken prior to June-July when the meat weights are large reducing the impacts of DMV closure or the impacts of a maximum 1-trip option. As a result, composition of annual landings in terms of size categories, thus the annual average prices, may not change significantly.
- Furthermore, if the reduced effort during the turtle window directed more on the areas with higher scallop abundance, meat-weight composition of the landings could increase during this window, resulting in even higher prices. It is also unlikely for this 7% shift in effort and landings to reduce prices significantly during the 7.5 months outside of the turtle window especially if the displaced effort is distributed more or less evenly and if some vessels try to maximize their revenue by taking their trips during months when prices are relatively higher because of lower landings especially during the winter months. The changes in other factors that impact prices such as the quantity of exports, import prices, size composition of scallops during and outside of the turtle window, and seasonal distribution of future landings are unknown at this time. In short, although it is not possible to quantify the impacts of RPM measures on prices with certainty, it is reasonable to expect that these impacts will be rather small.

Because the proposed RPM alternative would only affect the access areas by limiting the number of access trips in Mid-Atlantic areas to one trip and the vessels will be able to take their second

Mid-Atlantic access area trips outside of the June 15-October turtle window, there will be no reduction in their landings due the RPM measure. Because the LPUE will be lower outside the turtle season, however, by 2.2%, the vessels will need to spend more time at sea to land their 18,000 lb. trips. As a result, total fishing costs for the scallop fleet could increase slightly by $26,583.

Combining maximum one-trip alternative with the Delmarva closure in Sept-Oct could increase the economic impacts on the vessels further by reducing the flexibility for the vessels to optimize their incomes by choosing where and when to fish in response to the resource and market conditions. On the other hand, closing DMV and shifting some of the trips out of Sep-Oct. would lower the fishing costs because the higher meat weights could result in shorter fishing time. However, pushing some DMV trips to the June 15-August window can have some negative impacts on prices during that season. Therefore, the impacts of the combination alternative on the scallop fishery will depend whether the positive impacts on costs, meat-weight and prices would outweigh the negative impacts.

The alternative that would reduce Mid-Atlantic open area DAS would remove about 2.3 million lb., or about 7.5% to 7.8% of the total landings out of the turtle season, thus would have higher impacts on the prices compared to the proposed action. In addition, this alternative would reduce total landings. Because the LPUE would be lower outside of the turtle season, fishing with same number of DAS would result in lower landings of scallop pounds. It is estimated that that this alternative would reduce total fleet revenue by about $0.6 million in 2011 and 2012.

The Council did not select RPM alternatives that include seasonal closures due to the uncertain and unpredictable nature of regional impacts they cause, in addition to impacts on the seasonal landings stream and the safety of the fishery by pushing effort outside of the summer (best weather) months. Since the proposed trip maximum alternative limits the amount of effort each vessel can use in the Mid-Atlantic during the entire turtle season, it is more direct than measures that only limit effort for part of the turtle season. For example, if a seasonal closure is for two months only, all the effort reduced during those two months could be re-directed into months still within the 4.5 month turtle season from June 15 to October, have similar or even greater impacts on turtles, depending on when the effort shifts. The proposed alternative is expected to shift a considerable amount of effort, about 7.4% or over 700 days, from the season when turtles are more likely to be present in the Mid-Atlantic (June 15 – October 31). By limiting limit effort in this manner, the measure is expected to have beneficial effects on sea turtles, but not more than minor impacts on the scallop fishery.

The caveat that allows vessels that trade-in additional Mid-Atlantic trips to use two instead of one during this period also attempts to reduce the distributional impacts of this measure. Since FW22 is allocating split trips, some vessels may be allocated more trips in Mid-Atlantic access areas than other vessels, and some may choose to trade-in additional Mid-Atlantic trips. For these reasons the Council did not want the RPM to have a potentially much greater impact on some vessels compared to other vessels. Furthermore, area rotation is currently very successful because vessels are given the flexibility to trade trips, and if this RPM is too constraining, particularly for vessels from the south that are homeported near these areas, it could compromise the effectiveness of the area rotation program and have high distributional impacts.

5.4.13 Uncertainties and risks

The economic impacts presented in the following sections are analyzed using the estimate of prices, costs, revenues and total net benefits based on the economic model provided in Appendix I. The estimated fishing costs are used in calculating producer surplus for the proposed alternatives, which shows total revenue net of variable costs. The costs and the benefits of the proposed alternatives were analyzed based on the biological projections of landings, DAS and LPUE and the available information about the vessel costs and characteristics, crew shares and prices. The numerical results of these analyses should be interpreted with caution due to uncertainties about the likely changes in

- factors affecting scallop resource abundance
- fishing behavior
- fixed costs
- variable costs
- import prices
- demand for scallop exports
- bycatch and revenues from other fisheries
- the crew share system
- change in the number of active vessels
- structural changes in ownership
- changes in the composition of fleet in terms of tonnage, HP and crew size of the active vessels
- disposable income and preferences of consumers for scallops.

The estimated values of the economic cost/benefit analysis should be used, however, in comparing proposed action with the other alternatives since the uncertainties related to landings and prices are expected to affect all the alternatives in the same direction.

The landings streams, DAS and LPUE were obtained from the biological model, which is based on fishing mortality by area and the inputs are not fishery-based in terms of DAS, etc. The biological simulations do not model individual vessels or trips; it models the fleet as a whole. The output of the biological model and the landings streams were used to estimate the costs and benefits of the proposed action and the alternatives. There is uncertainty regarding how or if the landings streams with the new system of ACTs, buffers and AMs (Amendment 15) will be different from the landing streams without the previous management process. The results for economic impacts would change if the actual landings, size composition of landings and LPUE are different than the forecasted values from the biological model.

The prices are estimated using the ex-vessel price model described in Appendix III. This model takes into account the impacts of changes in meat count, domestic landings, exports, price of imports, income of consumers, and composition of landings by market category (i.e., size of scallops) including a price premium on under count 10 scallops. The important changes in external factors, i.e., in exports, imports, value of dollar, export and import prices had some unpredictable impacts on scallop prices in recent years, first resulting an increase to over $8 per pound (in terms of 2008 prices) in 2005, then a consequent decline to about $7 per pound (in terms of 2008 prices) in 2006 even though there was not a significant increase in scallop landings in 2006 (about 56 million lb.) compared to 2005 (about 54 million lb.). In 2010 fishing year, however, the decline in the value of dollar, increase in the landings of larger scallops resulted in much higher prices than anticipated in the last Framework action (Framework 21). Any change in the external factors that affect price, such as in import prices or in the differences between the actual and projected landings will result in differences in the actual and estimated prices.

For these reasons, the empirical results of the economic analyses should be used to compare the alternatives with each other and the with the baseline alternatives (No Action and Status quo), since a change in the variables listed above will change the numerical results in the same direction. For example, an increase in import prices would lead to a rise in ex-vessel prices and revenues above the levels estimated here. An increase in the price of oil, on the other hand, would increase the variable costs and reduce the cost savings under all options. While these changes would affect the absolute values of net economic benefits, the ranking of the alternatives in terms of their impacts on revenues, costs, and net benefits are not expected to change.

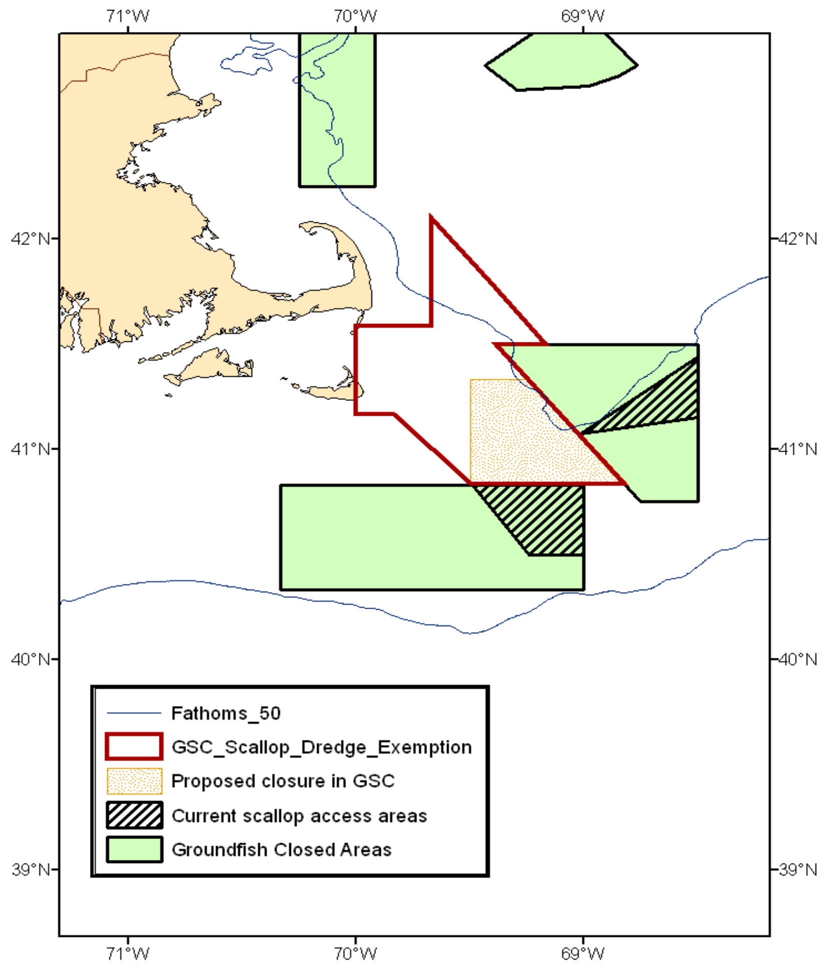
5.5 IMPACTS ON NON-TARGET SPECIES

The scallop fishery operates throughout the range of the scallop resource from Maine to North Carolina and results in the incidental catch of several other species. While some species are retained, other species are discarded due to restrictions in other fisheries or if the catch is not of value. Measures to minimize bycatch to the extent practicable in the scallop fishery pertain to all scallop vessels. The primary measures are the 10-inch minimum twine top restriction, and the bycatch TAC for yellowtail flounder in access areas. The 4-inch minimum ring size may also reduce finfish bycatch and reduces the bycatch of small scallops. The Northeast (NE) Multispecies and Monkfish FMPs also include measures to limit bycatch of species under the management of the specific FMP, as discussed in the following paragraphs.

The Northeast Multispecies FMP prohibits fishing in the Gulf of Maine/Georges Bank (GOM/GB) and Southern New England Exemption Areas unless a vessel is using exempted gear, is fishing under NE multispecies or scallop DAS, or is fishing under an exempted fishery. The prohibition prevents fisheries from occurring that might result in bycatch that could jeopardize the goals of the NE Multispecies FMP. Exempted fishery procedures in the NE Multispecies FMP allow a proven "clean" fishery to be implemented and allowed under the NE Multispecies FMP. Currently, the general category fishery can operate in two areas of the GOM/GB Exemption Area and in a portion of the SNE Exemption Area. In all three areas, vessels are restricted to 10 ½ ft dredges and may not possess any species other than scallops.

In the past the general category scallop fishery was prohibited from fishing in the Great South Channel Sea Scallop Exemption Area within the GOM/GB Exemption Area between April through June for one sub-area (the month of June for the other sub-area) (Figure 49). However, Framework 45 to the Multispecies FMP modified this prohibition so that the fishery can be prosecuted all year, no seasonal closures. The Council made this recommendation at the November 2010 Council meeting arguing that when the spawning closures were adopted, there were no hard limits to the amount of scallops that could be harvested in the area. But now that the General Category scallop fishery is operating under Individual Transferable Quotas, the main justification for the closure is moot. Furthermore, there is little solid evidence that scallop dredging interferes with yellowtail spawning. If approved, general category vessels will be permitted to fish in these areas, but will not be allowed to land YT unless they have permits to do so.

Figure 49 – Great South Channel Sea scallop exemption area (outlined in red)



The Monkfish FMP allows vessels fishing for other species to harvest monkfish depending on the monkfish permit category, the declared fishing activity (i.e., multispecies DAS, scallop DAS, and/or monkfish DAS), the area fished, and the gear used. Unless otherwise restricted under another FMP, a vessel fishing outside of monkfish DAS, and while fishing for scallops under general category rules, is permitted to catch and retain up to 50 lb of monkfish tails per day, up to 150 lb total for the trip. This limitation prevents a scallop vessel using dredge gear from targeting monkfish and limits bycatch during scallop trips.

Other FMPs include overall quotas, state-by-state quotas, possession limits, and gear restrictions that may also reduce bycatch. The Skate and Summer Flounder/Scup/Black Sea Bass FMPs offer examples. The Skate FMP restricts possession of some species of skates and requires a permit to catch and land skate. Vessels fishing for scallops under general category rules would be restricted to the Skate FMP possession limits, limiting the impacts on skates as bycatch. Management measures for the summer flounder fishery include a state-by-state quota. When the quota is closed in a particular state, vessels can no longer land summer flounder in that state. When the quota is closed, scallop vessels from that state, fishing under general category rules, may have less incentive to fish in areas where summer flounder catch might be high since it could not be landed in the closed state.

These measures under other FMPs would continue to limit the impacts on bycatch species that are caught in the general category scallop fishery under all of the alternatives considered in Framework 22.

5.5.1 Summary of Framework 22 impacts on non-target species

None of the measures included in the proposed action or range of alternatives considered are expected to have significant impacts on non-target species described in Section 4.5, Table 53. This action has considered the potential impacts of the proposed action on non-target species (small scallops as well as finfish and other bycatch species) and in general, all the measures under consideration have positive or neutral impacts on non-target species. Many of the measures considered in this action concentrate fishing effort in areas with high scallop catch per-unit-of-effort, which reduces fishing time having positive impacts on bycatch rates.

Revising the area rotation schedule on Georges Bank is expected to keep high scallop biomass levels in the access areas in the foreseeable future, thus the areas will continue as a source to achieve optimum yield while minimizing effects on bycatch. This action maintains the YT bycatch TAC in access areas in GB and SNE. Overall, this action provides more flexibility to the fleet allowing the industry to better adapt to changing resource conditions. When the fleet is able to fish more efficiently, there may be a reduction in the amount of fishing time, with the potential to reduce bycatch. Limiting open area DAS keeps scallop biomass at target levels and maintains relatively high scallop LPUE. This keeps vessels from fishing long durations in marginal areas, where bycatch can be higher than normal.

See Section 5.1.2.4 for a description of the projected bottom contact time for the various alternatives considered. Alternatives 1 and 2 have lower area swept and open area DAS than the status quo and No Action alternatives. The option with a one-year South Channel closure has higher area swept but lower open area DAS. Compared to 2010, all alternatives have substantially lower area swept projections.

Information specific to interactions with yellowtail flounder can be found in Section 5.5.2.

The only other measures under consideration in FW22 that may have direct impacts on non-target species are the measures related to compliance with the biological opinion as it relates to turtles. RPM Alternatives #1 and #2 will likely result in a reduction in scallop effort in the Mid-Atlantic during the summer and fall. This could have positive or negative impacts on non-target species depending on whether bycatch rates are substantially different in the Mid-Atlantic by season. Observer data for the scallop fishery is not available in the form necessary to evaluate seasonal differences in bycatch rates for the specific seasons and areas under consideration. As for the seasonal closures, the impacts of these measures are uncertain in terms of impacts on non-target species because it depends how fishing behavior changes as a result of a seasonal closures. For example, it would be difficult to conclude that a two-month closure of Delmarva in September and October would have an overall affect on bycatch rates of non-target species in that area if effort was fished different months of the year. Furthermore, it is not clear when effort will shift (what months of the year) so even if monthly bycatch rates were known, actual impacts on bycatch are uncertain because fishing behavior responses from these RPMs are uncertain. However, because there are possession limits and fishery quotas for most if not all of the non-target species in this region, total impacts on non-target species are expected to be limited as a result of any of the RPM measures.

Indirect benefits for non-target species and bycatch if set-asides help increase understanding of impacts from interactions with the scallop fishery and identify ways to minimize bycatch. Modifications made to the priorities related to bycatch are expected to have beneficial impacts on non-target species by increasing understanding of how the scallop fishery interacts with non-target species. It should be noted that the total amount of catch available for research is greater than it has been historically, so there may be indirect benefits if more catch is available to fund projects related to bycatch.

The measures under consideration that have no impact on non-target species are:

- ABC
- NGOM TAC
- Incidental catch TAC
- VMS modifications
- Increasing possession limit of in-shell scallops
- Extending the deadline for 2010 ETA trips
- Removing reference to GB access area schedule in regulations

Both the proposed and alternatives considered for all these measures are expected to have no impact on non-target species because they are not expected to directly change fishing patterns that would affect non-target species. The first three: ABC, NGOM TAC, and incidental catch TAC set limits of fishing equal to or similar to recent years so no additional impacts on non-target species expected. And the remaining items are primarily administrative in nature, so do not have direct impacts on non-target species.

5.5.2 Summary of yellowtail flounder bycatch information

Framework 44 to the Multispecies FMP allocated the YT-sub ACL amounts to the scallop fishery for 2010 through 2012 (Table 17). During development of Framework 45 to the Multispecies FMP and this action, the Council considered whether these allocations should change based on new resource information, and updated bycatch rates and scallop projections for Framework 22 (Table 18). The Council reviewed the updated estimates of YT catch in the scallop fishery under FW22 alternatives, and decided not to adjust the allocations set in Framework 44. Therefore, the allocations in Table 17 are still in effect for 2011 and 2012. If the scallop fishery exceeds these allocations, AMs will be triggered for the subsequent fishing year. In all cases except one the scallop fishery is estimated to catch less YT than has been allocated.

However, in 2012 on GB the fishery is estimated to catch 341.8 mt and the sub-ACL that year for that stock is 307 mt, so the risk of exceeding the sub-ACL may be higher in that area and year based on the current estimates. While the updated estimate of YT catch is 341.8 mt, the potential associated ACL would have been less than that, 298.4, since the Council decided in Framework 44 that the scallop fishery should be allocated 90% of estimated catch to provide incentive to reduce bycatch. The Council decided not to change allocations for YT sub-ACL allocations in FW45, so the final ACLs for the scallop fishery are in Table 17, so that is higher, 307 mt, but either way it is still less than the most updated projection of YT catch in the scallop fishery.

At the final framework meeting, the Council clarified that this AM in particular can be adjusted in the future when more data are available to make the seasonal closures as small and real time as possible. This was identified as a priority issue to consider in Framework 23 to the Scallop FMP. The combination of the YT TAC in GB access areas and the YT sub-ACL with AMs adopted under Amendment 15 are expected to minimize impacts of this fishery on YT flounder. Nothing in Framework 22 modifies those two measures; this action only specifies what the DAS compensation is if an access area closes when the YT TAC is reached.

Table 110 - YT sub-components (2010) and ACLs (2011 and 2012) allocated to the scallop fishery 2010-2012 (in mt) as specified in Multispecies Framework 44, and maintained in Framework 45

	2010	2011	2012	2013
GB	146	201	307	Will be set in subsequent GF action
SNEMA	135	82	127	

Table 111 – Estimated YT catch for the scallop fishery and potential associated ACL allocation for alternatives considered, proposed action shaded (mt)

		Updated bycatch estimate		ACL (90% est catch * 0.97)	
		GB	SNE	GB	SNE
FW22 Alt. 1	2011	175.3	57.6	153	48.2
	2012	341.8	83.7	298.4	70
FW22 Alt. 2	2011	50.3	57.6	43.9	48.2
	2012	291.6	103.4	254.6	86.6
FW22 SchCl	2011	298.7	54.9	260.7	46
	2012	351.8	83.1	307.1	69.6

5.6 IMPACTS ON OTHER FISHERIES

Overall, the impacts of area rotation on other fisheries have been analyzed in Amendment 10, the action that formally implemented area rotation. Framework 22 only slightly modifies the current allocations and specifications for the fishery, so no additional impacts on other fisheries are expected from the proposed action or range of measures considered in this action. Proposed allocation levels are similar to what they have been in recent years, so fishing activity in other fisheries by both LA and LAGC vessels is expected to be similar. See Section 4.6.1 for a description of the participation levels of scallop vessels in other fisheries. Despite the fact that most full-time vessels have various permits in other fisheries, less than 1% of total revenue is derived from landings in other fisheries. On the other hand, other fisheries are an important part of total income for part-time scallop vessels, as well as some LAGC vessels. Other important sources of revenue for part-time vessels were summer flounder (7% to 15% of total in 2005-2009), shrimp, menhaden, and squid in 2009 fishing year (Table 64).

5.6.1 ABC

There are not expected to be any additional impacts on other fisheries as a result of setting ABC values in the scallop fishery as proposed. Even the No Action ABC alternative is similar to proposed levels for 2011 and 2012, so no impacts overall.

5.6.2 Specifications – allocation alternatives and measures for LA, LAGC and set-asides

Since Framework 22 only slightly modifies the current allocations and specifications for the fishery, no additional impacts on other fisheries are expected. Proposed allocation levels are similar to what they have been in recent years, so fishing activity in other fisheries by both LA and LAGC vessels is expected to be similar. General category vessels are awarded more total catch under FW22 than in 2010 so may actually spend less time engaged in other fisheries overall. Limited access vessels will receive fewer DAS under the proposed action compared to No Action, but most of these vessels are not heavily engaged in other fisheries, so increases in other fisheries are not expected. The specified DAS compensation values set in this framework related to the YT bycatch TAC have no direct impacts on other fisheries. In addition, the research and observer set-aside measures have no direct impacts on other fisheries.

If No Action is taken under Framework 22 and the same allocations are awarded in 2011 there are not expected to be any additional impacts on other fisheries since vessels will likely continue fishing at similar levels in both the scallop fishery and other fisheries.

5.6.3 Measures to address impacts with sea turtles

None of the measures considered related to limiting scallop fishing effort to minimize impacts on sea turtles are expected to have impacts on other fisheries. These measures could shift scallop effort by area or season, but total fishing time will be the same so vessels will have similar opportunities to pursue other fisheries as they have now.

5.6.4 Modifications to VMS

As described in Section 2.10, two alternatives were considered: the No Action, which would not change the VMS regulations and Alternative 2.11.2, which would allow a vessel to turn their VMS unit off of it does not intend to land scallops. Neither of these measures is expected to have a direct impact on other fisheries because many vessels have other permits in other fisheries that would have restricted changes to their VMS system.

5.6.5 Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line

These alternatives are not expected to have direct impacts on other fisheries.

5.6.6 Extension of unused ETA trips through May 31, 2011

This alternative would allow full-time vessels to use any unused FY 2010 ETA trips through May 31, 2011. This may divert some effort planned in FY2010 to FY2011, but the overall effort and time at sea would be similar, so it would not impact other fisheries. No Action for this measure is not expected to have direct impacts on other fisheries either.

5.6.7 Eliminate reference to GB access area schedule in regulations

These alternatives are not expected to have direct impacts on other fisheries.

5.7 CUMULATIVE EFFECTS

5.7.1 Introduction

The term “cumulative effects” is defined in the Council of Environmental Quality’s (CEQ) regulations in 40 CFR Part 1508.7 as:
“The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”

In 1997, the CEQ published a handbook titled, *Considering Cumulative Effects Under the National Environmental Policy Act*. The CEQ identified the following eight principles of cumulative effects analysis, which should be considered in the discussion of the cumulative effects of the proposed action:

1. Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions.
2. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem, and human community of all actions taken, no matter who (federal, non-federal, or private) has taken the actions.
3. Cumulative effects need to be analyzed in terms of the specific resource, ecosystem, and human community being affected.
4. It is not practical to analyze the cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.
5. Cumulative effects on a given resource, ecosystem, and human community are rarely aligned with political or administrative boundaries.
6. Cumulative effects may result from the accumulation of similar effects or the synergistic interaction of different effects.
7. Cumulative effects may last for many years beyond the life of the action that caused the effects.
8. Each affected resource, ecosystem, and human community must be analyzed in terms of its capacity to accumulate additional effects, based on its own time and space parameters.

The following analysis will identify and characterize the impact on the environment by the Proposed Action and alternatives considered in Framework 22 when analyzed in the context of other past, present, and reasonably foreseeable future actions. Summary tables can be found following each of the text sections describing impacts. These tables contain brief summaries intended to distill the more detailed descriptions found in this section, and in Section 4.0 (Affected Environment), and Section 5.0 (Environmental Impacts). To enhance clarity and maintain consistency, the terms in Table 112 are used to summarize impacts.

Table 112 - Terms used in cumulative effects tables to summarize cumulative impacts

Impacts Are Known	Impacts Are Somewhat Uncertain
High Negative/Positive	Potentially High Negative/Positive
Negative/Positive	Potentially Negative/Positive
Low Negative/Positive	Potentially Low Negative/Positive
Neutral	Potentially Neutral
No Impact	

**In some cases, terms like "more" and "most" are used for the purposes of comparing management alternatives to each other.*

5.7.2 Valued Ecosystem Components

This document was structured such that the cumulative effects can be readily identified by analyzing the impacts on valued ecosystem components (VECs). The affected environment is described in this document based on VECs that were identified specifically for Amendment 15. The VECs identified for consideration in Framework 22 include: **Atlantic sea scallop resource; physical environment and essential fish habitat (EFH); protected resources; non-target species; fishery-related businesses and communities, and other fisheries**.

VECs represent the resources, areas, and human communities that may be affected by a proposed action or alternatives and by other actions that have occurred or will occur outside the proposed action. VECs are the focus of an EIS since they are the "place" where the impacts of management actions are exhibited. An analysis of impacts is performed on each VEC to assess whether the direct/indirect effects of an alternative adds to or subtracts from the effects that are already affecting the VEC from past, present and future actions outside the proposed action (i.e., cumulative effects). While the document includes a description of other potentially affected parts of the ecosystem such as bycatch and enforcement of scallop measures, these components are not included as a specific VEC for the cumulative effects. They have been described and discussed in terms of impacts, but they were not identified as primary valued ecosystem components.

Changes to the Scallop FMP have the potential to directly affect the sea scallop resource. Similarly, management actions that would alter the distribution and magnitude of fishing effort for scallops could directly or indirectly affect other species and their corresponding fisheries. The physical environment and EFH VEC focuses on habitat types vulnerable to activities related to general category scallop fishing. The protected resources VEC focuses on those protected species with a history of encounters with the scallop fishery. The fishery-related businesses and communities VEC could be affected directly or indirectly through a variety of complex economic and social relationships associated with either the scallop fishery or any of the other VECs.

The descriptive and analytic components of this document are constructed in a consistent manner. The Affected Environment (Section 0) traces the history of each VEC and consequently addresses the impacts of past actions. The Affected Environment section is designed to enhance the reader's understanding of the historical, current, and near-future conditions (baselines and trends) to fully understand the anticipated environmental impacts of the management action proposed in this amendment. The direct/indirect and cumulative impacts of the Proposed Action and other alternatives are then assessed in Section 5.0 of this document using a very similar structure to that found in the Affected Environment section. This EIS, therefore, is intended to follow each VEC through each management alternative.

5.7.3 Spatial and temporal boundaries

The geographic area that encompasses the biological, physical, and human community impacts to be considered in the following cumulative effects analysis is described in detail in Section 4.0 of this document. The physical range of the Atlantic sea scallop resource in the northeast region of the US is from Maine to North Carolina. The physical environment, including habitat and EFH, is bounded by the range of the Atlantic sea scallop fishery in the northeast region from Maine to North Carolina and includes adjacent upland areas (from which non-fishing impacts may originate). For Protected Species and non-target species, the geographic range is the total range of the Atlantic sea scallop fishery. The geographic range for human communities is defined to be those fishing communities bordering the range of the scallop fishery.

Overall, the temporal scope of past and present actions for scallops, the physical environment and EFH, protected species, non-target species, fishery-related businesses and communities, and other fisheries is focused principally on actions that have occurred since 1996, when the Magnuson-Stevens Fishery Conservation and Management Act was enacted and implemented new fisheries management and EFH requirements. In 1996, the Magnuson-Stevens Act identified sustained participation of fishing communities as a new National Standard (#8), so consideration of fishery-related businesses and communities is consistent within this temporal scope. The temporal scope for marine mammals begins in the mid-1990s, when NMFS was required to generate stock assessments for marine mammals that inhabit waters of the U.S. EEZ creating the baseline against which current stock assessments are evaluated. For turtle species, the temporal scope begins in the 1970s, when populations were noticed to be in decline.

The temporal scope for scallops is focused more on the time since the Council first submitted the Scallop FMP in 1982, and particularly since 1994 when Amendment 4 to the FMP implemented the general category scallop permit. The Scallop FMP was developed with comprehensive analysis as part of a complete EIS, which this document serves to supplement and update. The FMP has been adjusted a number of times since 1982, and many elements of the management plan that are not specifically addressed in this amendment will continue to influence the status of the sea scallop resource.

The Atlantic sea scallop fishery has a long history dating back to the late 1800s. Section 1.3 summarizes the major changes in the scallop fishery and management program since the FMP was approved in 1982. Landings information for the scallop fishery date back to the early 1900s (Serchuck et al, 1979), but the temporal scope for fishery-related businesses and communities extends back to 1994 to consider impacts from the date the general category permit was first issued.

The temporal scope of future actions for all VECs extends several years into the future, the next 2-3 years. This period was chosen because of the dynamic nature of resource management and lack of specific information on projects that may occur in the future, which make it difficult to predict impacts beyond this time frame with any certainty. In addition, most measures proposed in this action are only in place for one or two years.

5.7.4 Past, present and reasonably foreseeable future actions

Section 4.0 of this document summarizes the current state of the scallop resource and the limited access and general category scallop fisheries, and it provides additional information about habitat and protected resources that may be affected by the Proposed Action.

5.7.5 Past and Present actions

A summary of the impacts of past and present actions have been considered relative to the VECs in this amendment and are described below and presented in Table 114.

Scallop Resource

The Council established the Scallop FMP in 1982 and later implemented several Amendments and Framework Adjustments to modify the original plan. See Section 1.3 for a detailed description of past and present actions. One major action in the past (1994) includes Amendment 4, which implemented limited access for the directed scallop fishery that is primarily managed by DAS and other controls such as crew limits and gear restrictions. During that same year, large areas on Georges Bank were closed to scallop fishing because of concerns over finfish bycatch and disruption of spawning aggregations.

In 1999 Framework Adjustment 11 to the Scallop FMP allowed the first scallop fishing within portions of the Georges Bank groundfish closed areas since 1994. Since then, several other framework actions have provided controlled access in these areas. In 2004 Amendment 10 to the Scallop FMP introduced rotation area management and changed the way that the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of DAS for limited access vessels to fish in any area, vessels had to use a portion of their total DAS allocation in the controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. Vessels could fish their open area DAS in any area that was not designated a controlled access area. The amendment also adopted several alternatives to minimize impacts on EFH, including designating EFH closed areas, which included portions of the groundfish mortality closed areas. The most recent action that provided controlled access in the access areas was Framework 18 for FY2006 and FY2007.

Several other actions have recently been implemented: Amendment 13, Framework 20, the SBRM Amendment (Amendment 12 to the Scallop FMP), and Framework 21.   The Council approved Amendment 12 to the Scallop FMP in June 2007. This action is an omnibus amendment to all FMPs in the region and focuses on defining a standardized bycatch reporting methodology (SBRM). Section 303(a) (11) of the Magnuson-Stevens Fishery Conservation and Management Act requires that all FMPs include “a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery.” The SBRM Omnibus Amendment will ensure that all FMPs fully comply with the Act. SBRM is the combination of sampling design, data collection procedures, and analyses used to estimate bycatch and to determine the most appropriate allocation of observers across the relevant fishery modes.

Scallop Amendment 13 was also approved by both the Council and NMFS in 2007, which re-activated the industry-funded observer program. Since 1999, vessels required to carry an observer are authorized to land more than the possession limit from trips in access areas, and in open areas, vessels are charged a reduced amount to help compensate for the cost of an observer. Observers were deployed through a contractual arrangement between National Marine Fisheries Service (NMFS) and an observer provider until June 2004. This arrangement was not renewed because of unresolved legal issues concerning the use of a contract to administer the industry-funded observer program. For some time, NMFS funded observers while a solution to this issue was investigated. As funding became insufficient, an interim rule went into effect that approved a new mechanism to use the observer set-aside funds through a non-contracted vendor. Amendment 13 was necessary to make this temporary mechanism part of the regulations. The Council selected final measures for that action at the February 2007 Council meeting and it was implemented on June 12, 2007. Amendment 13 also includes a provision to make changes to the observer set-aside program by framework action and the Council decided to address some issues raised with the current program in Framework 19.

The Council approved Framework 20 to the Scallop FMP at the June 2007 Council meeting and NMFS implemented that action afterward. Framework 20 considered measures to reduce overfishing for FY2007 through measures that were implemented by interim action earlier in the year. At the November 2006 Council meeting, the Scallop PDT informed the Council that overfishing was likely to occur in 2007 under status quo measures implemented under Framework 18. The PDT presented several alternatives to reduce fishing mortality. The Council ultimately recommended that NMFS reduce the allocated number of trips for all scallop permit categories in the Elephant Trunk Access Area (ETA), delay the opening of the ETA, and prohibit vessels from possessing more than 50 bushels of in-shell scallops when leaving any controlled access area. NMFS agreed with the Council that the ETA has an unprecedented high abundance of scallops, which needs to be husbanded with precaution to effectively preserve the long term health of the scallop resource and fishery, and so implemented these measures by interim action.[6] This interim action became effective on December 22, 2006, and remained effective until June 20, 2007 (180 days). This interim action was then extended for an additional 180 days, and expired on December 26, 2007. Therefore, for the last two months of the 2007 fishing year (January-February 2008), management would have reverted back to status quo measures under FW18. Specifically, higher trip allocations would have been granted in the Elephant Trunk Area for both limited access and general category fisheries. Therefore, the Council approved Framework 20 to extend the reduced fishing effort measures implemented by interim action through the end of the 2007 fishing year. This action expired on March 1, 2008, when Framework 19 was scheduled to be in place.

Framework 19 set specifications to adjust DAS allocations and set the area rotation schedule for 2008 and 2009. Maintaining the previous fishing mortality target of $F = 0.20$ is expected to have positive impacts on the scallop resource by reducing the risk of overfishing and establishing

[6] The interim rule published by NMFS on December 22, 2006 (**71 FR 76945**), included all measures recommended by the Council, except the prohibition on a vessel leaving an access area with more than 50 bu. of in-shell scallop was limited to the ETA only and not all access areas as recommended by the Council.

measures to achieve optimum yield on a continuing basis. In addition, the Hudson Canyon area was closed in this action which will help the FMP achieve optimum yield by reducing mortality on small scallops. Framework 19 also revised the overfishing definition, which was expected to have positive impacts on the scallop resource. The updated model is less biased, uses more sources of data, and is an improvement on the previous model.

It also addressed new requirements for the general category fishery including quarterly hard-TAC allocations for the transition period to an IFQ program. This action also included the details of a cost recovery program that was approved in Amendment 11 for general category IFQ permit owners. In addition, Amendment 11 approved a hard-TAC for a Northern Gulf of Maine (NGOM) limited entry program. FW19 included the specific hard-TAC for that program for the next two fishing years. General category vessels were allocated 5% of the total catch in access areas in both FY2008 and 2009 under this framework. The last alternative related to Amendment 11 was an estimate of incidental catch mortality that will be removed from the total projected catch before allocations are made.

Other measures in Framework 19 included alternatives to address specific issues with the observer set-aside program. In addition, the action included a provision for a vessel to power down their VMS unit for a minimum of 30 days. This action also included a clarification about when a vessel can leave for an access area trip. Lastly, this action approved research priorities to be incorporated in the RSA program for FY2008 and FY2009. The Council selected final measures for that action at the October 2007 Council meeting and it was implemented on June 1, 2008. The final rule for Framework 19 to the FMP was published on May 29, 2008 (73 FR 30790).

The Council approved Amendment 11 to the Scallop FMP (June 2007) and most of it was implemented in 2008. The full IFQ program was implemented in early 2010. The main objective of the action was to control capacity and mortality in the general category scallop fishery. Since 1999, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices. This additional effort is likely a contributing factor to why the FMP has been exceeding the fishing mortality targets. Without additional controls on the general category fishery, there is a great deal of uncertainty with respect to potential fishing mortality from this component of the scallop fishery; thus, the potential for overfishing is increased. The outcome of Amendment 11 is that mortality of the general category fleet will be controlled, thus reducing the potential for overfishing and having strong positive effects on the scallop resource.

Framework 21 was approved by the Council at the January 2010 Council meeting, and was implemented in summer 2010. It sets the fishery specifications for fishing year 2010, implements measures to comply with the RPM relating to sea turtles in the recent biological opinion (NMFS, 2008), and makes minor adjustments to the observer set-aside program. FW21 allocates 38 DAS to vessels and reduces access area trips from five to four. The selected alternative does not close the Channel so there will be higher LPUE and lower area swept in the near-term, which could positively affect the resource. In general the measures for general category vessels related to Framework 21 are expected to have positive to neutral impacts on the scallop resource.

The alternatives to comply with RPM for turtles could have a wide range of impacts on the resource depending on how fishing behavior changes in accordance with the measures. The alternatives with seasonal closures in Delmarva for September and October are potentially beneficial for the resource if effort shifts to months in which meat weights are higher because reducing effort in the area during months of lower meat yields will reduce mortality. A reduction in possession limits in either Elephant Trunk or Delmarva would also be a positive impact on the resource because lower effort levels would presumably cause an increase in stock biomass.

The alternatives to improve the observer set-aside program will not have direct impacts on the scallop resource, but could potentially have indirect positive impacts from better monitoring coverage leading to better management.

Framework 44 to the Multispecies FMP will have an impact on the scallop resource because the fishery is dependent on the allocation of yellowtail flounder needed to harvest a certain amount of scallops. According to Amendment 16 to the Multispecies FMP a specific portion of the total ABC for YT will be allocated to the scallop fishery as bycatch. If approved, Framework 44 will allocate 100% of the yellowtail that is needed to harvest the projected scallop catch for 2010. Final action on this framework was made in November 2009 and it is expected to be implemented before May 1, 2010. This action is expected to have neutral impacts on the scallop resource for 2010 since 100% of the YT projected to be needed by the scallop fishery will be allocated. However, in the future (2011 and 2012), FW44 will only allocate 90%, so less effort may be allocated to the scallop fishery in those years; unless other modifications can be made to catch the same amount of scallops and less YT. If overall scallop effort has to be reduced in future actions to prevent exceeding YT allocations, there may be indirect beneficial impacts on the scallop resource as a result of less effort overall.

The cumulative impacts of past and present management actions have resulted in substantial effort reductions in the scallop fishery. Sea scallop biomass has mostly increased since 1999, and the resource has not been overfished. It is estimated that area rotation management will end overfishing permanently and provide a healthy resource for scallop fishermen to harvest for the long-term. Overall, the realized reductions in effort from past management actions have been positive for the scallop resource.

Physical Environment and EFH

The effects of mobile bottom-tending gear (trawls and dredges) on fish habitat have been recently reviewed by the National Research Council (NRC 2002). This study determined that repeated use of trawls/dredges reduce the bottom habitat complexity by the loss of erect and sessile epifauna and smoothing sedimentary bedforms and bottom roughness. This activity, when repeated over the long term also results in discernable changes in benthic communities, which involve a shift from larger bodied long-lived benthic organisms for smaller shorter-lived ones. This shift also can result in loss of benthic productivity and thus biomass available for fish. Therefore, such changes in bottom structure and loss of productivity can reduce the value of the bottom habitat for demersal fish, such as haddock and cod. These effects varied with sediment type, with lower level of impact to sandy communities, where there is higher natural disturbance to a high degree of impact to hard-bottom areas such as bedrock, cobble and coarse gravel, where the substrate and attached epifauna are more stable. Use of trawls and dredges are common in inshore and offshore areas. The primary gear used in the scallop fishery is dredge gear; however, there is some otter trawl gear used in the scallop fishery. It is assumed for this analysis that the effects of bottom tending mobile gear, particularly dredge gear, are generally moderate to high, depending upon the type of bottom and the frequency of fishing activities to demersal species affected by this action. These activities, which cause impacts to essential fish habitat for a number of federally managed species in a manner that is more than minimal and less than temporary in nature, have been mitigated by the measures in Amendment 10 and by other actions described in Table 113.

Amendment 10 implemented a series of year-round closed areas to scallop gear to protect EFH in those areas. Furthermore, a gear modification (4-inch ring size) was implemented to reduce mortality on small scallops and reduce contact with the bottom. Total DAS allocated under Amendment 10 were reduced, which had indirect benefits to EFH by reducing overall scallop fishing effort and thus reducing area swept by dredge gear. It should be noted that sea scallop EFH is not considered adversely affected by dredge or otter trawl fishing effort.

Table 113 includes a description of measures implemented by the Council in last major FMP amendments to minimize, mitigate or avoid adverse impacts on EFH.

In Amendment 13 to the Multispecies FMP the New England Council implemented a range of measures to minimize the impacts of bottom trawling in the Gulf of Maine, Georges Bank and Southern New England. In addition to the significant reductions in days-at-sea and some gear modifications (implemented through Scallop Amendment 10), the Council closed 2,811 square nautical miles (Habitat Closed Areas) to all bottom-tending mobile fishing gear, including scallop dredges. Framework 16 to the Scallop FMP/Framework 39 to the Multispecies FMP updated the Habitat Closed Area boundaries established by Amendment 10 to be consistent with those established by Amendment 13. On August 2, 2005, the portions of Framework 16/39 that modified the habitat closures to be consistent with A13 habitat closed areas were vacated by a court order. As a result, both the Amendment 10 and the Amendment 13 closures remain in effect. Table 113 includes a description of measures implemented by the Council in last major FMP amendments to minimize, mitigate or avoid adverse impacts on EFH, including measures established under other FMPs.

Framework 22 does not propose any changes to the current measures to minimize the adverse impacts of scallop fishing on EFH. No additional measures are needed at this time because most measures proposed in this action are expected to have neutral to positive impacts on EFH.

Table 113 - Description of measures implemented by Council in last major FMP amendments to minimize, mitigate or avoid adverse impacts on EFH.

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
CLOSED AREA MEASURES				
Mortality Closure	Multispecies	Retention of existing groundfish closed areas in the Gulf of Maine, George's Bank and Southern New England. Addition of Cashes as a year round closure	Year-round closures provide habitat benefits to the areas within the closures. The addition of Cashes Ledge as a year-round closure will benefit EFH. Rare kelp beds are found in that area.	+
Habitat Closed Areas (MPAs)	Multispecies and Scallop	2811 square nautical miles closed to bottom-tending mobile gear indefinitely in five separate closed areas in GOM, GB and SNE.	Significant benefits to EFH by minimizing adverse effects of bottom trawling, scallop dredging and hydraulic clam dredging by prohibiting use.	+
Rotational Area Management (RAM)	Scallop	Amendment 10 implemented a rotational area management strategy which introduced a systematic structure that determines where vessels can fish and for how long. Framework adjustments will consider closure and re-opening criteria.	Expected to have positive effects on habitat because effort on gravelly sand sediment types is expected to decline. In general, swept area is expected to decline in most of the projected alternatives (especially in the Mid-Atlantic region), which could have positive impacts on EFH.	+
Habitat Closed Areas (MPAs)	Monkfish	Amendment 2 closed Oceanographer and Lydonia Canyons to trawls and gillnets on a monkfish DAS.	Precautionary action taken to ensure that any expansion of the monkfish fishery as a result of the other measures in Amendment 2 will not affect sensitive deep-sea canyon habitats for which EFH is designated.	+
EFFORT REDUCTION MEASURES				
Monkfish DAS usage by limited access permit holders in scallops and multispecies fisheries	Monkfish	Retain current requirement for vessels to use both monkfish DAS and scallop or multispecies DAS simultaneously	This alternative relies on the scallop and multispecies management plans to set DAS levels (with the exception of when DAS fall below 40 DAS). As DAS have been reduced by management actions over the past two years, consequent impacts on habitat by the directed monkfish fishery have been reduced proportionally. Further reductions are possible depending on management actions in these two plans.	+
Capacity Control	Multispecies	DAS can be transferred with restrictions and new measures for "reserve days"	Any measure that is intended to reduce the amount of time fishing by mobile gear will likely have benefits to EFH. These measures reduce amount of latent effort as well.	+
DAS Reductions	Multispecies	Mix of adaptive and phased effort reduction strategies. A days (60% of effective effort) B days (40% of effective effort) C days (FY01 allocation).	Reducing DAS will likely benefit EFH by reducing the amount of time vessels can fish.	+

Measure	Source FMP (implemented by)	Description	Description of Habitat Impacts	Overall Habitat Impact
		Provides opportunity to fish on stocks that do not need rebuilding.		
DAS Limits	Scallops	Amendment 10 implemented a new program that allocates specific number of DAS for open areas and controlled access areas.	The total DAS allocation in open areas is significantly less than the Status quo DAS allocation. Less DAS translates into less fishing effort, so positive for EFH. Furthermore, CPUE in controlled access areas is expected to be greater, thus the gear is expected to spend less time on the bottom.	**+**
Possession Limits	Scallops	Reduced possession limit for limited access vessels fishing outside of scallop DAS	Vessels with limited access permits are currently allowed to possess and land up to 400 lbs per trip of shucked scallop meats when not required to use allocated DAS; this measure will reduce possession limit to 40 lbs/trip) and reduce fishing effort by vessels that have been targeting scallops under the higher general category possession limit. Scallops harvested under this provision cannot be sold.	**+**
GEAR MODIFICATION MEASURES				
Minimum mesh size on directed MF DAS	Monkfish	Mobile gear vessels are required to use either 10-inch square or 12-inch diamond mesh in the codend. Gillnets must be at least 10 inches	The mesh size regulations do not have a direct effect on habitat, but may indirectly minimize adverse effects of the fishery on complex bottom types by reducing the ability to catch groundfish, and therefore the incentive to target those fish in hard bottom areas.	**+**
Roller gear restriction	Monkfish	Establishes maximum roller gear diameter size for vessels fishing on a monkfish DAS.	Positive but not significant – sets maximum roller gear diameter equivalent to size currently in use in the area; prevents expansion of trawl effort into complex bottom areas and canyons.	**+**
Four inch rings	Scallop	Increase ring size on scallop dredge rig to 4" everywhere.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently-opened areas where large scallops are abundant, but will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent.	**-/+**
OTHER MEASURES				
Observer Coverage	Multispecies	10% requested by 2006 for each gear type	If observers are able to collect data of interest to EFH management, increased coverage could indirectly benefit habitat.	**+**
TAC Set-Aside for research	Scallop	2% set-aside from TAC and/or DAS allocations to fund scallop and habitat research and surveys	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions.	**+**

Protected Species
Before 2001, there were only three known interactions between sea turtles and scallop dredge gear (NMFS, 2007). By 2001, scallop fishing intensity in the Mid-Atlantic region increased following a general decline of scallop biomass in the Georges Bank region and closure of the groundfish Closed Areas in December 1994. Since turtle interactions in the high use areas and seasons are in part related to fishing effort, sea turtles may have benefited from reductions of fishing effort allocations in Amendments 4 and 7 to the Scallop FMP. During this time, DAS use declined from more than 40,000 DAS in 1993 to about 23,000 DAS in 1999, before increasing to about 31,000 DAS, in 2003 (NEFMC, 2005). The amendments and intervening framework adjustments also made other management changes, including new gear restrictions, although the effect of these changes on sea turtle interactions is unknown.

The extent of interactions between fishing with scallop dredges and sea turtles is still under investigation. Following the opening of the Hudson Canyon Access Area and increased observer coverage in the area, additional interactions between sea turtles and scallop dredge gear became known. New research is continuing to identify additional gear modifications and changes in fishing that could reduce interactions in the fishery.

The main goal of Amendment 10 to the Scallop FMP was to focus scallop fishing effort in areas where biomass is greatest with the rationale that actual fishing time is likely to be reduced as the overall catch per tow increases. Scallop management areas have been monitored through annual scallop surveys for scallop biomass and growth rates. When biomass in a closed area is high and the growth rates decline (i.e. the scallop resources are at maximum levels in the area) areas open to fishing at a controlled level. Conversely, closings occur when the reverse situation occurs (low biomass and high growth rate indicating a depleted scallop resource in the area). While Scallop Amendment 11 continued this management program, its purpose was to control capacity and mortality in the general category scallop fishery.

Certain general statements can be made regarding areas in the scallop management unit. Shifts in scallop effort from the Mid-Atlantic region to areas of Georges Bank may have had the effect of reducing potential risks to sea turtles. As the Georges Bank scallop resource is reduced and the Mid-Atlantic areas rebound a reverse shift in effort from an area of low use for turtles to high use areas in the Mid-Atlantic may potentially increase the risk of interactions from current levels. Accordingly, impacts to protected species could shift back and forth over the years under the management scheme implemented under Amendment 10. Since modifications to NEFMC management actions will occur through framework adjustments and plan amendments, they will undergo additional review to assess impacts to protected species.

The sea scallop FMP currently has one primary measure in place to protect sea turtles: a gear modification called a turtle chain designed to minimize impact of takes. Another major way takes have been reduced is due to general reductions in scallop fishing. In general, scallop effort has declined over the years and catch per-unit-of-effort has increased dramatically under area rotation. Comparing 2004 to 2009, the number of total DAS allocated has declined by 39%. The average DAS allocated from 2004-2007 was 19,182, which is about 29% more than the estimate of allocated DAS for 2009. More and more effort is concentrated in access areas with higher catch rates, so gear is in the water much less than in the past.

Fishing effort in the Mid-Atlantic has changed over time. In general, total catch from the MA was very low from 1994 until more recently. From 2004-2007, about 60% of total catch from MA access areas and open areas. There is typically a peak in the spring until more recent years (2007 and 2008). The peak used to be May/June, and more recently it has shifted to April or even March. When the Elephant Trunk area was open in 2007 and 2008 more catch occurred during the early spring and later in the year compared to spring and summer in earlier years. This shift of effort, likely caused by the high amount of effort allocated to ETA and the two month turtle closure from Sept1-Oct 31) seems to have reduced scallop fishing during most of the year when turtles are expected to be in the Mid-Atlantic. Overall catch in the Mid-Atlantic has steadily reduced during both turtle seasons under consideration in FW21 from 50-60% to closer to 30% for both time periods.

Five Biological Opinions for the sea scallop fishery have been issued since 2003. The latest Biological opinion was completed by NMFS on March 14, 2008 which summarized the overall impacts to threatened and endangered species. It concluded that the fishing operations being carried out under the Scallop FMP and as modified by Framework 19 were likely to adversely affect, but not jeopardize the continued existence of loggerhead, leatherback, Kemp's ridley and green sea turtles. ESA requires incidental take statement (ITS) and any reasonable and prudent measures (RPMs) necessary to minimize impacts along with implementing terms and conditions. One specific RPM in the most recent biological opinion included a requirement to limit scallop fishing.

Framework 21 and all future frameworks will include alternatives to comply with the scallop fishery-specific RPM mentioned above. The selected alternatives to comply with RPM for turtles used in FW21 included a seasonal closure in Delmarva for September and October and a limit on the amount of trips that can be used in the Mid-Atlantic from June 15 through August 31. These are both expected to have positive impacts on protected species by reducing effort in the area where they are known to cause interactions during the expected timeframe of these interactions.

The alternatives under consideration in this action do not appear to have any adverse cumulative effects on protected species that would alter the prognosis for impacts of fishing under Amendment 10 and Framework Adjustment 19, although there are other sources of human-induced mortality and/or harassment of turtles in the action area. These include incidental takes in state-regulated fishing activities, vessel collisions, ingestion of plastic debris, and pollution. While the combination of these activities may affect populations of endangered and threatened sea turtles, preventing or slowing a species' recovery, the magnitude of these effects is currently unknown.

State Water Fisheries - Fishing activities are considered one of the most significant causes of death and serious injury for sea turtles. A 1990 National Research Council report estimated that 550 to 5,500 sea turtles (juvenile and adult loggerheads and Kemp's ridleys) die each year from all other fishing activities besides shrimp fishing. Fishing gear in state waters, including bottom trawls, gillnets, trap/pot gear, and pound nets, take sea turtles each year. However, information on the takes is limited. Given that state managed commercial and recreational fisheries along the

Atlantic coast are expected to continue within the action area in the foreseeable future, additional takes of sea turtles in these fisheries is anticipated.

Vessel Interactions – NOAA Fisheries STSSN data indicate that interactions with small recreational vessels are responsible for a large number of sea turtles stranded each year within the action area. Collision with boats can stun or easily kill sea turtles, and many stranded turtles have obvious propeller or collision marks.

Pollution and Contaminants - Marine debris (*e.g.*, discarded fishing line or lines from boats) can entangle turtles in the water and drown them. Turtles commonly ingest plastic or mistake debris for food. Chemical contaminants may also have an effect on sea turtle reproduction and survival. While the effects of contaminants on turtles are relatively unclear, pollution may be linked to the fibropapilloma virus that kills many turtles each year (NOAA Fisheries 1997). If pollution is not the causal agent, it may make sea turtles more susceptible to disease by weakening their immune systems. Excessive turbidity due to coastal development and/or construction sites could influence sea turtle foraging ability. As mentioned previously, turtles are not very easily affected by changes in water quality or increased suspended sediments, but if these alterations make habitat less suitable for turtles and hinder their capability to forage, eventually they would tend to leave or avoid these less desirable areas (Ruben and Morreale 1999).

Low and Mid-frequency Sonar – See Section 5.7.7.
The factors discussed above, and other factors, potentially have had cumulative adverse effects on most protected species to varying degrees. Because of a lack of cause-effect data, little is known about the magnitude and scope of these factors and how they have contributed to the species' listing.

A number of activities are in progress that may ameliorate some of the negative impacts on marine resources, sea turtles in particular, posed by the activities summarized above. Education and outreach are considered one of the primary tools to reduce the risk of collision represented by the operation of federal, private, and commercial vessels.

NMFS' regulations require fishermen to handle sea turtles in such a manner as to prevent injury. Any sea turtle taken incidentally during fishing or scientific research activities must be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water according to a series of procedures (50 CFR 223.206(d)(1)). NMFS has been active in public outreach efforts to educate fishermen regarding sea turtle handling and resuscitation techniques. NMFS has also developed a recreational fishing brochure that outlines what to do should a sea turtle be hooked and includes recommended sea turtle conservation measures. These outreach efforts will continue in an attempt to increase the survival of protected species through education on proper release guidelines.

There is an extensive network of STSSN participants along the Atlantic and Gulf of Mexico coasts. This network not only collects data on dead sea turtles but also rescues and rehabilitates live stranded turtles. Data collected are used to monitor stranding levels and identify areas where unusual or elevated mortality is occurring. The data are also used to monitor incidence of disease, study toxicology and contaminants, and conduct genetic studies to determine population structure. All states that participate in the STSSN are collecting tissue for genetic studies to better understand the population dynamics of the northern subpopulation of nesting loggerheads. These states also tag live turtles when encountered through the stranding network or in-water studies. Tagging studies help provide an understanding of sea turtle movements, longevity, and reproductive patterns, all of which contribute to our ability to reach recovery goals for the species.

There is no organized formal program for at-sea disentanglement of sea turtles. However, recommendations for such programs are being considered by NMFS pursuant to conservation recommendations issued with several recent Section 7 consultations. Entangled sea turtles found at sea in recent years have been disentangled by STSSN members, the whale disentanglement team, the USCG, and fishermen. NMFS has developed a wheelhouse card to educate fishermen and recreational boaters on the sea turtle disentanglement network and disentanglement guidelines.

Actions taken to protect sea turtles include a Strategy for Sea Turtle Conservation and Recovery in Relation to Atlantic Ocean and Gulf of Mexico Fisheries (Sea Turtle Strategy), released by NMFS in June 2001, to address the incidental capture of sea turtle species in state and federal fisheries in the Atlantic and Gulf of Mexico. The major elements to the strategic plan include: continuing and improving stock assessments; improving and refining estimation techniques for the takes of sea turtles to ensure that ESA criteria for recovery are being met; continuing and improving the estimation or categorization of sea turtle bycatch by gear type and fishery; evaluating the significance of incidental takes by gear type; convening specialist groups to prepare take reduction plans for gear types with significant takes; and promulgating ESA and MSFCMA regulations implementing plans developed for take reduction by gear type. Actions taken under the Sea Turtle Strategy are expected to provide a net benefit to sea turtles.

In February 2003, NMFS issued a final rule to amend regulations protecting sea turtles to enhance their effectiveness in reducing sea turtle mortality resulting from shrimp trawling in the Atlantic and Gulf areas of the southeastern U.S. Turtle Excluder Devices (TEDs) have proven to be effective at excluding sea turtles from shrimp trawls; however, NMFS has determined that modifications to the design of TEDs needed to be made to exclude leatherbacks and large and mature loggerhead and green sea turtles. In addition, several approved TED designs did not function properly under normal fishing conditions. NMFS disallowed these TEDs. Finally, the rule requires modification to the try net and bait shrimp exemptions to the TED requirements to decrease mortality of sea turtles (68 FR 8456, 21 Feb 2003).

Significant measures have been taken to reduce sea turtle takes in summer flounder trawls and trawls that meet the definition of summer flounder trawls, which would include fisheries for species like scup and black sea bass, by requiring TEDs in trawl nets fished in the area of greatest turtle bycatch off the North Carolina and part of the Virginia coast from the North Carolina/South Carolina border to Cape Charles, VA. These measures are attributed to significantly reducing turtle deaths in the area (NMFS, 2007). In addition, NMFS issued a final rule (67 FR 56931), effective September 3, 2002, that closes the waters of Pamlico Sound, NC to fishing with gillnets with a mesh size larger than 4 1/4 inch (10.8 cm) stretched mesh ("large-mesh gillnet"), on a seasonal basis from September 1 through December 15 each year, to protect migrating sea turtles. The closed area includes all inshore waters of Pamlico Sound south of 35º 46.3' N. lat., north of 35º 00' N. lat., and east of 76º 30' W. long.

In December 2003, NMFS issued new regulations for the use of gillnets with larger than 8 inch stretched mesh in federal waters off of North Carolina and Virginia (67 FR 71895, 3 Dec. 2002). Gillnets with larger than 8 inch stretched mesh are not allowed in federal waters (3-200 nautical miles) north of the North Carolina/South Carolina border at the coast to Oregon Inlet at all times; north of Oregon Inlet to Currituck Beach Light, NC from March 16 through January 14; north of Currituck Beach Light, NC to Wachapreague Inlet, VA from April 1 through January 14; and, north of Wachapreague Inlet, VA to Chincoteague, VA from April 16 through January 14. Federal waters north of Chincoteague, VA are not affected by these new restrictions although NMFS is looking at additional information to determine whether expansion of the restrictions are necessary to protect sea turtles as they move into northern mid-Atlantic and New England waters. These measures are in addition to Harbor Porpoise Take Reduction Plan measures that prohibit the use of large-mesh gillnets in southern mid-Atlantic waters (territorial and federal waters from Delaware through North Carolina out to 72 30'W longitude) from February 15-March 15, annually.

In May 2004, the agency issued regulations prohibiting the use of all pound net leaders, set with the inland end of the leader greater than 10 horizontal ft (3 m) from the mean low water line, from May 6 to July 15 each year in the Virginia waters of the mainstem Chesapeake Bay, south of 37º 19.0' N. lat. and west of 76º 13.0' W. long., and all waters south of 37º 13.0' N. lat. to the Chesapeake Bay Bridge Tunnel at the mouth of the Chesapeake Bay, and the James and York Rivers downstream of the first bridge in each tributary. Outside this area, the prohibition of leaders with greater than or equal to 12 inches (30.5 cm) stretched mesh and leaders with stringers, as established by the June 17, 2002 interim final rule, will apply from May 6 to July 15 each year. The action, taken under the ESA, is necessary to conserve sea turtles listed as threatened or endangered. NMFS also provides an exception to the prohibition on incidental take of threatened sea turtles for those who comply with the rule (69 FR 24997, 5 May 2004).

In July 2004, NMFS issued sea turtle bycatch and bycatch mortality mitigation measures for all Atlantic vessels that have pelagic longline gear onboard and that have been issued, or are required to have, Federal HMS limited access permits, consistent with the requirements of the ESA, the MSFCMA, and other domestic laws. These measures include mandatory circle hook and bait requirements, and mandatory possession and use of sea turtle release equipment to reduce bycatch mortality. This final rule also allows vessels with pelagic longline gear onboard that have been issued or are required to have Federal HMS limited access permits to fish in the Northeast Distant Closed Area if they possess and/or use certain circle hooks and baits, sea turtle release equipment, and comply with specified sea turtle handling and release protocols (69 FR 40733, 6 Jul 2004).

NMFS has published a final rule (70 FR 42508, July 25, 2005) that allows any agent or employee of NMFS, the FWS, the U.S. Coast Guard, or any other Federal land or water management agency, or any agent or employee of a state agency responsible for fish and wildlife, when acting in the course of his or her official duties, to take endangered sea turtles encountered in the marine environment if such taking is necessary to aid a sick, injured, or entangled endangered sea turtle, or dispose of a dead endangered sea turtle, or salvage a dead endangered sea turtle that may be useful for scientific or educational purposes. NMFS already affords the same protection to sea turtles listed as threatened under the ESA (50 CFR 223.206(b).

In 2006, NMFS finalized a rule (71 FR 50361, August 23, 2006) that requires modification of scallop dredge gear by use of a chain mat when the gear is fished in Mid-Atlantic waters south of 49 9.0'N from the shoreline to the outer boundary of the EEZ during the period May 1 through November 30 each year. The intent of the dredge gear modification is to reduce the severity of some turtle interactions that might occur by preventing turtles from entering the dredge bag.

On February 15, 2007 the agency also issued an advance notice of proposed rulemaking to announce it is considering amendments to the regulatory requirements for turtle excluder devices (TEDs). Among other issues, specific changes include increasing the size of the TED escape opening currently required for sea scallop trawl gear and moving the current northern boundary of the Summer Flounder Fishery-Sea Turtle Protection Area off Cape Charles, Virginia to a point farther north. The objective of the proposed measures is to effectively protect all life stages and species of sea turtle in Atlantic trawl fisheries where they are vulnerable to incidental capture and mortality.

In 2008 a Loggerhead Sea Turtle Recovery Plan was published (NMFS and USFWS 2008) which did not include the Atlantic sea scallop fishery as a main source of mortality of the species. This document estimated loggerhead bycatch in the scallop fishery and the impact of takes on the population.

Non-target Species

The non-target species considered for this action are described in Section 4.5, Table 53. Actions taken by the Council in the Scallop FMP in past, present, and reasonably foreseeable timeframe are mostly positive on non-target species. Specific gear and area restrictions are in place that have reduced bycatch of various non-target species. Effort controls to maintain sustainability in the scallop fishery have reduced effort and increased efficiency of the fleet, which reduces impact on non-target species.

There are also several gear modification in place that have reduced impacts on non-target species. Specifically, since 1999 vessels have been required to use 10” twine top mesh in access areas to reduce finfish bycatch. Under Amendment 10, that requirement was expanded to all areas increasing the benefit of this gear. Amendment 10 also required all vessels to have rings throughout the chain bag that are no less than 4” in diameter. This requirement improves size selectivity and reduces incentive to target small scallops, but it also reduces bottom contact time on DAS because vessels become more shucking limited, so gear is fishing less. This has benefits for non-target species as well since gear is fishing less per DAS.

Amendment 16 to the Multispecies FMP was implemented in May 2010. This action identified a process for setting annual catch limits (ACLs) for all Groundfish species. A sub-ACL will apply to all scallop fishery catches of yellowtail flounder, and is expected to have a positive effect on this and other non-target species.

Framework 44 to the GF plan recognizes the importance of yellowtail flounder to the scallop fishery and provides an incentive for scallop fishermen to reduce their YT bycatch in order to maximize scallop yield. Framework 44 also requires that all limited access vessels be required to land all legal-sized yellowtail flounder, which will improve data quality and thus be beneficial to non-target species.

Framework 21 to the scallop plan implemented FY2010 specifications which were similar to FY2009, and these are expected to have a neutral to potentially positive impact on non-target species.

Fishery-related Businesses and Communities
All actions taken under the Scallop FMP have had effects on fishery-related businesses and communities. None have specifically been developed to primarily address elements of fishing related businesses and communities. In general, actions that prevent overfishing have long-term benefits on businesses and communities that depend on those resources. Some actions that limit participation, such as the limited entry program that was adopted under Amendment 4 had distributional impacts on individuals and ports that participated in the scallop fishery at that time. While short-term negative impacts may follow an action that reduces effort, past and present actions had positive cumulative impacts on vessel owners, crew and their families in the scallop fishery by increasing their fishing revenues, incomes and standard of living. The impacts of these past and present actions were also positive for the related sectors including dealers, processors, primary suppliers to the vessels that sell them gear, engines, boats, etc. The increases in gross profits for scallop vessels and in crew incomes have had positive economic benefits on these sectors indirectly through the multiplier impacts. Total landings have increased, catch per unit of effort has increased, and price has steadily increased as well.

The Passamaquoddy Native American Tribe has been awarded licenses in the State of Maine to harvest scallops in state waters since 1998. Since this is a state fishery, the state of Maine monitors these landings. However, the impact of this fishery on the overall scallop resource is minimal because the size of the fleet is small relative to the scallop fleet managed under this FMP.

Other Fisheries
When Amendment 4 implemented limited entry for directed scallop effort, there was a stipulation that any vessel that qualified had to relinquish any other limited access permits (i.e. multispecies) unless that vessel qualified for a combination permit. Therefore, the ability of these qualifying vessels to fish in other limited access fisheries was eliminated. In effect, potential capacity and effort in other limited access fisheries has been reduced since 1994. Since the main component of the scallop fishery directs on scallops, the impacts of scallop actions on other fisheries is limited. The frameworks that have permitted controlled access in portions of the Georges Bank groundfish mortality closed areas have assessed the impacts on non-target species and they have not been significant. The access area program is under a yellowtail flounder bycatch TAC, so when that TAC is projected to be caught the area closes to scallop fishing. This has reduced impacts of scallop fishing on YT flounder within the access areas. Overall, measures adopted under the Scallop FMP do not have direct significant impacts on other fisheries.

Past and present actions relating to the summer flounder trawl fishery may also affect the general category trawl fishery. In summary, Amendment 10 made a number of changes to the summer flounder regulations implemented by Amendment 2 and later amendments to the Summer Flounder, Scup and Black Sea Bass FMP. Specifically, this amendment modified the commercial minimum mesh regulations, continued the moratorium on entry of additional commercial vessels, removed provisions that pertain to the expiration of the moratorium permit, prohibited the transfer of summer flounder at sea, and established a special permit for party/charter vessels to allow the possession of summer flounder parts smaller than the minimum size.

Amendment 11, approved by NMFS in 1998, was implemented to achieve consistency among Mid-Atlantic and New England FMPs regarding vessel replacement and upgrade provisions, permit history transfer, splitting, and renewal regulations for fishing vessels issued Northeast Limited Access Federal fishery permits.

Amendment 12 was developed to bring the Summer Flounder, Scup, and Black Sea Bass FMP into compliance with the new and revised National Standards and other required provisions of SFA. Specifically, the amendment revised the overfishing definitions (National Standard 1) for summer flounder, scup, and black sea bass and addressed the new and revised National Standards (National Standard 8 - consider effects on fishing communities; National Standard 9 - reduce bycatch; and National Standard 10 - promote safety at sea) relative to the existing management measures. The amendment also identified essential habitat for summer flounder, scup and black sea bass. In addition, Amendment 12 added a framework adjustment procedure that allows the Council to add or modify management measures through a streamlined public review process. Amendment 12 was partially approved on April 28, 1999.

Amendment 13 fully addressed how the management measures implemented to successfully manage these three species comply with the National Standards. Amendment 13 also addresses the fishing gear impacts to essential fish habitat. The Council has implemented many regulations that have indirectly acted to reduce fishing gear impacts on EFH.

In addition, Amendment 14 to this plan included a rebuilding timeline for scup, and Framework 7 built flexibility into the process to define and update status determination criteria for each plan species, and made scup GRAs modifiable through the framework adjustment process. All of these actions are expected to have positive impacts on the resource by making management more effective.

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

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

The Councils submitted Amendment 5 on September 23, 2010, with a target implementation date of May 1, 2010. The Councils developed Amendment 5 primarily to bring the Monkfish FMP into compliance with the requirements of the reauthorized Magnuson-Stevens Fishery Conservation and Management Act (MSA) which contains several new requirements including the requirement that all fisheries adopt annual catch limits (ACLs) to prevent overfishing by either 2010 (if subject to overfishing) or 2011 (if not subject to overfishing), and measures to ensure accountability. Since neither monkfish stock is currently subject to overfishing, the FMP is not required to have ACLs and accountability measures (AMs) in place until the start of the 2011 fishing year.

Amendment 5 was also developed to bring the Monkfish FMP into compliance with recently revised National Standard 1 (NS1) Guidelines (74 FR 3178; January 16, 2009) which not only establishes a process for setting ACLs and guidance for establishing AMs, it provides updated guidelines for establishing reference points and control rules (i.e., maximum sustainable yield (MSY), optimum yield (OY), overfishing limits (OFL), acceptable biological catch (ABC), ACLs, and annual catch targets (ACTs)) and clarifies the relationship between them. Amendment 5 establishes biological and management reference points to be consistent with NS1 guidelines utilizing the most recent scientific information available at the time it was developed, from the 2007 DPWG assessment.

As noted above, a more recent assessment of the monkfish resource was conducted in June 2010 (SARC 50). Given the timing of SARC 50 and when the Councils took final action on Amendment 5 in June 2010, Amendment 5 did not update the biomass reference points in the FMP as recommended by SARC 50. One of the outcomes of the assessment is that the values associated with the ABC control rule adopted in Amendment 5 were recalculated by the SSC, and, in the case of the NMA, were reduced to a level below the ACT proposed in Amendment 5, hence the Councils have undertaken this framework adjustment to address this issue.

Third, Amendment 5 contains new specifications of DAS and trip limits associated with the new catch targets, to replace those adopted in Framework 4. The specifications are to be in effect for the 2011-2013 fishing years unless modified by some future management action. Additionally, if no action is taken for the years after 2013, the current plan states that the specifications will remain in place until modified. In the case of the NMA, the need to revise the ACT also requires revision to the specifications, as proposed in this framework.

The New England Council approved final measures for inclusion in Framework Adjustment 7 to the Monkfish plan in January 2011. If approved by NMFS, the action will include revised biomass reference points and a Northern Management Area (NMA) Annual Catch Target (ACT), as well as the associated days-at-sea and trip limits for the 2011-2013 fishing years. This action is primarily needed because the NMA ACT proposed in Amendment 5 is above the updated Allowable Biological Catch recommended by the Scientific and Statistical Committee. The Mid-Atlantic Council will take final action on Framework 7 at its February 8-10 meeting.

Finally, 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. A host of management actions have taken place since this time which have aimed to control effort and limit entry into the fishery. These measures have helped to lower fishing mortality on overfished stocks through effort controls, gear regulations, and area closures, and therefore the long-term trend for cumulative impacts on the resource has been positive. However many of these actions have resulted in decreased access to the resource thus having negative impacts on human communities. Multispecies Amendment 16 was approved by the Council in June 2009 and the action was implemented in May 2010. This action updates status determination criteria and formal rebuilding programs, fishery program administration (sectors), and measures to meet mortality objectives. When considering the long-term positive trends in rebuilding in combination with further effort control measures designed to maintain or achieve sustainable stocks, the cumulative impact of MS Amendment 16 would be positive. While the short-term impacts, particularly to the human communities VEC, continue to be negative primarily due to economic losses, in the future as the status of the fishery improves and stocks recover, the industry and communities that rely on fisheries will incur positive impacts. A16 did include a provision to allow a vessel to possess both a limited access scallop and limited access multispecies permit. This is expected to have positive impacts on the vessels that are able to obtain both permits.

Table 114 – Summary of effects from past and present actions. The effects from this action are included in a later table.

Action	Description	Impacts on Scallops	Impacts on Physical Env. and EFH	Impacts on Protected Species and Non-target species	Impacts on Fishery and Communities	Impacts on Other Fisheries
SCALLOP ACTIONS						
Scallop FMP	Restore adult scallop stock and reduce fluctuation in stock abundance	Positive	Positive	Positive	Positive	Positive
Amendment 4	Changed the primary management mechanism from the meat-count standard to an effort control program for all resource areas	Positive	Positive	Positive	Positive	Positive
Amendment 10	Implement area rotation program and other measures to prevent overfishing and minimize impacts on EFH	Positive	Positive	Positive	Positive	Positive
Framework 18	Set management measures for FY2006 and FY2007	Positive	Neutral	Neutral	Positive	Neutral to potentially positive
Amendment 13	Implement the industry funded observer program	Positive	Neutral	Positive	Neutral	Neutral to potentially positive
Framework 20	Implement measure to reduce effort in January and February of 2007	Positive	Neutral	Neutral	Positive	Neutral to potentially positive
SBRM Amendment	Implement a bycatch reporting methodology	Potentially Neutral	No Impact	Potentially Positive	Potentially Neutral	Neutral to potentially positive
Framework 19	Set management measures for FY2008 and 2009, eliminated crew size restriction, LAGC IFQ program, obs and RSA program improvements, and VMS 30-day power down	Positive	Neutral	Neutral	Positive	Neutral to potentially positive
Amendment 11	Limited entry program for the general category fishery	Potentially Positive	Potentially positive	Potentially positive	Potentially positive for some and potentially negative for others	Neutral to potentially positive
Framework 21	Set management measures for FY2010, reduced effort in such a way to minimize sea turtle bycatch as per the BiOp, improvements to LAGC, observer, and RSA programs	Potentially positive	Potentially positive	Potentially positive	Potentially positive	Neutral to potentially positive
SUMMARY OF IMPACTS FROM SCALLOP ACTIONS-		**Positive**	**Positive**	**Positive**	**Positive**	**Positive**
PHYSICAL ENVIRONMENT AND EFH ACTIONS						
EFH Omnibus Amendment (1998)	Comply with 1996 SFA to describe and identify EFH and minimize impacts of fishing on EFH	Positive	Positive	Neutral	Neutral	Positive
A13/A10	Gear effects evaluation, minimize adverse impacts	Positive	Positive	Neutral to Positive	Negative	Positive
SUMMARY OF IMPACTS FROM PHYSICAL ENV/EFH ACTIONS –		**Positive**	**Positive**	**Neutral**	**Neutral/Negative**	**Positive**
PROTECTED RESOURCES and NON-TARGET ACTIONS						
Chain mat rule	Gear modification to address turtle bycatch in the Mid-	Neutral	Neutral	Positive	Low Negative	Neutral

Action	Description	Impacts on Scallops	Impacts on Physical Env. and EFH	Impacts on Protected Species and Non-target species	Impacts on Fishery and Communities	Impacts on Other Fisheries
	Atlantic					
Gear modifications	Twine top and other gear modifications to reduce finfish bycatch	Neutral	Neutral	Positive	Positive	Potentially positive
SUMMARY OF IMPACTS OF PROTECTED SPECIES AND NON-TARGET ACTIONS		Neutral	Neutral	Positive	Neutral to positive	Neutral to potentially positive
FISHERY AND COMMUNITY ACTIONS						
None Specific	N/A	N/A	N/A	N/A	N/A	N/A
OTHER FISHERY ACTIONS						
FMPs and associated actions for Monkfish, Summer flounder, Multispecies, etc.		Neutral to Positive	Positive	Positive	Negative to Positive	Positive
SUMMARY OF IMPACTS OF ALL PAST AND PRESENT ACTIONS ON EACH VEC		**Positive**	**Positive**	**Positive/Neutral**	**Positive/Neutral**	**Positive/Neutral**

5.7.6 Reasonably Foreseeable Future Actions

The impacts of reasonably foreseeable future actions have been considered relative to the VECs in this amendment and are described below and presented in Table 115. Overall, the impacts associated with reasonably foreseeable future actions to the VECs considered in this assessment are neutral and/or considered to be insignificant, as most impacts cannot be predicted at this time.

Scallop Resource

Several reasonably foreseeable future federal fishery management actions may affect the scallop resource. In general, the actions in the foreseeable future are expected to have positive impacts on the scallop resource overall.

- Amendment 15 to the Scallop FMP

Amendment 15 was voted on by the Council in September, 2010 and implementation is expected around June 1, 2011. Most alternatives proposed have neutral to positive indirect/direct impacts on the scallop resource when compared to No Action. Adoption of ACLs and AMs is required by the reauthorized Magnuson Act as a means of ending and preventing overfishing, so this action should inherently have positive impacts on the resource. Generally, the analysis of scientific uncertainty and incorporation of buffers and AMs should improve management and make the fishery less likely to exceed F_{target}.

A15 is also proposing measures that will adjust the current overfishing definition (OFD) to be more compatible with area rotation. Specifically, the new overfishing definition would average fishing mortality over time and not space; area-specific thresholds would be set based on past fishing mortality rates and area rotation policies and combined into one overall threshold. This more accurate model should increase the likelihood of successful management and be positive for the scallop resource by preventing growth overfishing.

Minor adjustments to the recently-implemented limited access general category management program that would affect the scallop resource are also being considered including an allowance of IFQ rollover, modification to the general category possession limit up to 600 pounds, and adjusting the restriction on maximum quota per fishing platform from 2% to 2.5% of the total general category allocation. These adjustments should increase the efficiency of the fleet and have a positive effect on the resource.

A range of options are being considered to address timing concerns and efficient use of resource for the RSA program which would be indirectly beneficial to the resource.

- Framework 23 to the Scallop FMP

The Council initiated Framework 23 at the January 2011 Council meeting. The primary purpose of this action is to address four very specific issues identified by the public and Council to improve the overall effectiveness of the Scallop FMP. The need is to develop measures to minimize impacts on sea turtles through the requirement of a turtle excluder dredge; to improve the effectiveness of the accountability measure adopted under Amendment 15 for the YT flounder sub-ACL, consider specific changes to the general category NGOM management program to address potential inconsistencies, and to consider modifications to the vessel monitoring system to improve fleet operations. The Council is only beginning to develop alternatives for this action with final action expected in September 2011, so the impacts are still relatively uncertain.

Physical Environment and EFH

In the spring of 2003, the New England Council initiated a Habitat Omnibus Amendment that will be considered Amendment 14 to the Atlantic Scallop FMP. It will also amend the Northeast Multispecies (Amendment 14), Monkfish (Amendment 4), Herring (Amendment 3) Skate (Amendment 2), Red Crab (Amendment 3) and Atlantic Salmon (Amendment 3) FMPs. This omnibus amendment will fulfill the five year EFH review and revision requirement specified in 50 CFR Section 600.815(a)(10). Although it is not known at this time how the recommendations might change fisheries or fisheries management, the intention is to provide additional habitat and species protection where it is needed.

Phase 1 of the EFH Omnibus has been substantially completed by the Council and includes new EFH designations for all species and life stages under management by the NEFMC, designation (but no management restrictions) of several habitat areas of particular concern (HAPC), an evaluation of the major prey species for species in the NEFMC fishery management units (FMU) and an evaluation of the potential impacts of non-fishing activities on EFH. Although the Council has completed Phase 1, the document and corresponding actions will not be submitted for implementation (and, therefore, no Record of Decision will be filed) until the completion of Phase 2 sometime in 2011. The potential exists for changes to the current suite of management measures to minimize adverse impacts on EFH (see Table 113) and/or additional measures to be implemented. The public will have the opportunity to comment on a combined Phase 1/Phase 2 document before final decisions are made by the Council.

Amendment 15 also included a measure to make the EFH closed areas consistent under the Multispecies and Scallop FMPs. This alternative was chosen to create more consistency between management plans and allow greater access to areas with high concentration of the scallop resource as originally intended in Amendment 10 to the Scallop FMP and Framework 16/39 to the Scallop/NE Multispecies FMPs.

Protected Species

NMFS recognizes that the specific nature of the interaction between sea turtles and scallop dredge gear remains unknown. The scallop dredge may strike sea turtles as it is fished, and this interaction would remain undocumented. Sea turtles could be taken when the dredge is being fished on the bottom or during haulback. NMFS does not know how the modified gear interacts with sea turtles on the bottom and in the water column. In order to understand the interaction, research is currently being conducted and is expected to continue. This work may provide more information on the interaction between sea turtles and scallop dredge gear in the water.

Currently there is an EIS in development for an Atlantic Trawl Rule to require the use of TEDs in trawl fisheries off the Northeast coast including the scallop trawl fishery. This rule consists of a series of temporal and spatial requirements for TED use. The scoping period has ended for this EIS and it is not clear when decision on this action will be made at this time. It is difficult to determine if there will be cumulative impacts on each VEC because this action is still early in development.

Non-target Species

The non-target species considered for this action are described in Section 4.5, Table 53. Amendment 15 is expected to have positive impacts on non-target species, especially YT flounder by establishing a sub-ACL and associated AMs in the scallop fishery. The scallop fishery will be limited to a specific poundage of YT each year, and if it is exceeded, specific areas will be closed the following year to account for the overage. Framework 23 to the Scallop FMP may consider adjustments to the YT AMs, but the alternatives have not been developed yet so the impacts are still uncertain.

Fishery-related Businesses and Communities

Overall A15 is expected to have neutral / potentially negative to potentially positive impacts on fishing communities. While ACLs will have positive impacts on the fishery long term by preventing overfishing, there may be some negative impacts short term from reduced effort allocations. ACLs for YT flounder could have negative impacts on the scallop fishery if AMs are triggered. Other action in A15 should have positive impacts on the fishery, especially from measures to increase efficiency for the LAGC fishery. FW21 should have neutral to positive impacts on fishing communities.

Other Fisheries

Multispecies FW45 will have potentially positive impacts on fishery-related businesses and communities in the short term if it allows the LAGC exemption and alters the Georges Bank yellowtail flounder rebuilding schedule. Amendment 6 to the Monkfish Plan is considering implementing a catch share system. The Council has begun scoping for this action but it is not clear yet what specific alternative will ultimately be developed. Overall, the impacts under development for the scallop and multispecies plans are likely to have neutral to positive impacts on other fisheries. The impacts of Monkfish Amendment 6 are too uncertain since alternatives are still not developed.

Table 115 – Summary of effects from reasonably foreseeable future actions

Action	Description	Impacts on Scallops	Impacts on Physical Env. and EFH	Impacts on Protected Species and non-target species	Impacts on Fishery and Communities	Impacts on Other Fisheries
Scallop Actions						
Amendment 15	Compliance with ACLs, other measures to make FMP more effective	Positive	Positive	Neutral to Positive	Neutral to Positive	Neutral
Framework 23	Consider turtle excluder dredge, YT AMs, NGOM modifications and VMS	Uncertain	Uncertain	Uncertain	Uncertain	Uncertain
SUMMARY OF IMPACTS FROM SCALLOP ACTIONS-		**Neutral to potentially positive**	**Neutral to potentially positive**	**Neutral to potentially positive**	**Neutral/ potentially positive**	**Neutral/ potentially positive**
Physical Environment and EFH Actions						
Phase I EFH Omnibus	Review EFH designations, consider HAPC alternatives, describe prey species, evaluate non-fishing impacts	Positive	Positive	Neutral	Neutral	Positive
Phase II EFH Omnibus	Review gear effects and minimize adverse impacts	Potentially neutral	Positive	Potentially Neutral	Potentially positive or negative	Neutral to potentially positive
SUMMARY OF IMPACTS FROM PHYSICAL ENV/EFH ACTIONS –		**Positive**	**Positive**	**Neutral**	**Neutral**	Neutral to potentially positive
Protected Resources Actions						
Sea turtle strategy	NMFS program to address incidental capture of turtles in state and federal fisheries	No Impact	No Impact	Positive	Low Negative	Neutral to positive
Atlantic take reduction team	Requirements to reduce interaction with marine mammals	No Impact	No Impact	Positive	Low Negative	No impact
Use of TEDS in trawl gear	Action under consideration that could require the use of TEDs in trawl fisheries off the Northeast coast including the scallop trawl fishery	No Impact	No Impact	Positive	Potentially negative to potentially positive	Neutral to positive
SUMMARY OF IMPACTS FROM PROTECTED RESOURCES ACTIONS		**No Impact**	**No Impact**	**Positive**	**Low Negative**	**Neutral**
Fishery Community Actions						
N/A						
Non-target species Actions						
Multispecies Framework 45		**Neutral**	**Positive**	**Positive**	**Positive**	**Positive**
Summary of RFFA Impacts		**Neutral to Potentially Positive**	**Neutral to Potentially Positive**	**Neutral to Potentially Positive**	**Neutral to Potentially Positive**	**Neutral to Potentially Positive**

5.7.7 Non-fishing impacts

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material.

Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. This action is not expected to change the impacts on the VECs described above from non-fishing impacts.

The non-fishing impacts discussed in this section (Table 116) include:

- Dredge and fill activities;
- Pollution/water quality;
- Agricultural and silvicultural/timber harvest runoff;
- Pesticide application;
- Water intake structures/discharge plumes;
- Loss of coastal wetland;
- Road building and maintenance;
- Flood control/shoreline stabilization;
- Utility lines/cables/pipeline installation;
- Oil and gas exploration/development/production;
- Introduction of exotic species;
- Aquaculture operations;
- Marine mining; and
- Other potential sources.

Low and mid-frequency sonar may pose an additional threat to protected species. According to the June 2006 National Marine Fisheries Service's Biological Opinion (BO), issued under Section 7(a)(2) of the Endangered Species Act, regarding the effects of the U.S. Navy's proposed 2006 Rim of the Pacific Naval Exercise and the Permits, Education and Conservation Division's proposal to issue an incidental harassment authorization (IHA) for exercises associated with endangered and threatened species, acoustic systems are becoming increasingly implicated in marine mammal strandings. Citing the Joint Interim Report on the Bahamas Marine Mammal Stranding Event of 15–16 March 2000, DOC and the Department of the Navy (DON), 2001, the document discusses that mass strandings in particular have been linked to mid-frequency sonar.

Summarizing various theories associated with the impacts of low and mid-frequency sonar, the BO states that marine mammals become disoriented or that the sound forces them to surface too quickly, which may cause symptoms similar to decompression sickness, or that they are physically injured by the sound pressure. The biological mechanisms for effects that lead to strandings must be determined through scientific research, according to the NMFS document, which also provides an extensive overview of the issue. The Biological Opinion, the IHA permit issued on July 2006 and other related documents are available through NMFS at http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications.

More recent information on the impacts of low and mid-frequency sonar is provided in a request from the U.S. Navy for an authorization under the Marine Mammal Protection Act (MMPA) to take marine mammals by harassment, incidental to conducting operations of Surveillance Towed Array Sensor System (SURTASS) Low Frequency Active (LFA) sonar over a five-year period (72 FR 37404, July 9, 2007).

Federal legislation being debated in Congress could override a lawsuit settlement agreement and exempt the military from the “harassment” provisions of the MMPA, easing the restrictions that now limit the deployment of low frequency sonar by the U.S. Navy.
The **National Offshore Aquaculture Act** is proposed to provide the necessary authority to the Secretary of Commerce to establish and implement a regulatory system for aquaculture in Federal waters. The bill would: authorize the Secretary to issue offshore aquaculture permits and establish environmental requirements where existing requirements under current law are inadequate; exempt permitted offshore aquaculture from legal definitions of fishing that restrict size, season, and harvest methods; authorize the establishment of a research and development program in support of offshore aquaculture; require the Secretary to work with other Federal agencies to develop and implement a streamlined and coordinated permitting process for aquaculture in the EEZ; authorize to be appropriated “such sums as may be necessary” to carry out this Act; and provide enforcement for the Act.

In addition, one way the United States plans to meet its present and future energy demands is through the importation of **Liquefied Natural Gas (LNG).** Currently, the United States has four onshore LNG import terminals in coastal port areas: Everett, Massachusetts, Cove Point, Maryland, Elba Island, Georgia, and Lake Charles, Louisiana. These four existing import terminals have been around since the 1970s. There is an additional onshore import facility located in Penuelas, Puerto Rico. This facility began importing liquefied natural gas in August 2000.

Due to potential hazards associated with onshore LNG terminals, many state and local governments have opposed the construction of any new onshore LNG terminals. For example, there have been numerous proposals for onshore LNG terminals along the coast of Maine. Most of these proposals (Harpswell, Hope Island, Cousins Island, Sears Island, and Pleasant Point) have either been rejected by local voters or withdrawn. Most opponents to onshore LNG terminals maintain that LNG is unsafe, harms the environment, and disrupts commercial fishing. Companies, like ChevronTexaco and Shell, are now moving towards developing LNG terminals offshore on the outer continental shelf.

In April 2005, Gulf Gateway Energy Bridge (formerly known as El Paso Energy Bridge) became the world’s first offshore LNG terminal to begin operation. Gulf Gateway is located 116 miles offshore of the Louisiana coastline. To date, including Gulf Gateway, there are three offshore LNG projects that have been approved. These three LNG terminals are all located in the Gulf of Mexico. Port Pelican’s (ChevronTexaco) proposed site is located thirty-six miles off the Louisiana coastline, while Gulf Landing’s (Shell) is located thirty-eight miles offshore of Louisiana.

Nationally, seven proposed offshore LNG terminals are currently under review, including a potential terminal to be built offshore of Gloucester, Massachusetts. The other projects under review include: Cabrillo Port (fourteen miles offshore of Ventura County, California), Clearwater Port (fourteen miles offshore of southern California), Main Pass Energy Hub (offshore of Alabama, Louisiana, and Mississippi), Compass Port (offshore of Alabama and Mississippi), Pearl Crossing (forty-one miles offshore of Louisiana), and Beacon Port (offshore of Louisiana). The application for the proposed offshore LNG terminal off the coast of Gloucester (Gateway and Neptune projects) has been approved.

The two primary effects on the commercial and recreational fishing industries from offshore LNG terminals are the indirect impacts of displaced fishing effort and the potential for adverse impacts on fish stocks resulting from adverse impacts on EFH due to the vaporization process, where LNG is converted from a liquid to gaseous state. The degree to which the scallop fishery in particular may be impacted cannot be fully understood until an LNG terminal has completed the sitting process. However, a recent EIS filed by the U.S. Coast Guard and the Maritime Administration on the Main Pass Energy Hub plan indicates that the "open-loop" vaporization process, which pushes seawater through a radiator-type structure that warms and vaporizes the super-cooled LNG and discharges that water back into the sea, would affect fish eggs and larvae as well as other zooplankton and phytoplankton. The resulting impacts are limited to the water discharge plumes, and while no firm data on the size of such plumes have been provided, the report states that the effects will not be serious or long lasting. The report concludes that none of the potential impacts on EFH would be expected to result in population-level impacts or a reduction in biomass for any stocks.

According to preliminary documents filed with the U.S. Coast Guard and the Federal Energy Regulatory Commission, displacement of fishing effort would be limited to a less than one nautical mile radius circle that would be closed to all fishing and recreational activities during the offloading of LNG. Additionally, a security zone of less than one quarter of a nautical mile would be maintained around the LNG tankers as they transit to and from the offload facility. While these closures may displace a limited amount of fishing effort, the total amount of fishable bottom impacted is expected to be minimal, and the effort displaced would not likely have an adverse impact on neighboring, or any other, fishing areas.

Onshore LNG facilities are currently being proposed or planned for construction in Pleasant Point, ME; Somerset, MA; Providence, RI; Long Island Sound, NY; Logan Township, NJ; Philadelphia, PA; and an expansion of an existing facility in Cove Point, MD.

Depending on the specific location and type of LNG facility, a range of impacts to fisheries and/or fisheries habitat may result from both construction and operation of terminals. Due to the large size of LNG tankers, dredging may need to occur to access onshore terminals. Dredging can result in direct loss of fish and/or shellfish habitat and can elevate levels of suspended sediment within the water column. As with other dredging, suspended sediments can impact various life stages of fish and shellfish. Further, the construction of pipelines and fill associated with site construction can have adverse impacts on inter-tidal habitats and salt marshes in the area.

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

The Army Corps of Engineers has developed a DEIS and has completed a scoping process for the proposed Cape Wind Associates (CWA) project on Horseshoe Shoal. If constructed, the turbines would preempt other bottom uses in an area similar to oil and natural gas leases. The potential impacts associated with the CWA offshore wind energy project include the construction, operation and removal of turbine platforms and transmission cables; thermal and vibration impacts; and changes to species assemblages within the area from the introduction of vertical structures. A thorough analysis of the effects of these impacts on fishing has not yet been conducted, but data indicate that there would not be a substantial impact on the scallop fishery as there is little scallop fishing activity in this area. While EFH may be adversely impacted in the vicinity of the wind turbines, the extent of this proposal is not sufficient to have any population-level impacts on resource biomass or health.

Non-fishing activities pose a risk to EFH for all species as well as to each scallop life stage's EFH. Many of the non-fishing impacts are unquantifiable, but are likely negative. In general, the greatest potential for adverse impacts to scallops and scallop EFH occurs in close proximity to the coast where human-induced disturbances, like pollution and dredging activities, are occurring. Because inshore and coastal areas support essential egg, larval and juvenile scallop habitats, it is likely that the potential threats to inshore and coastal habitats are of greater importance to the species than threats to offshore habitats. It is also likely that these inshore activities will continue to grow in importance in the future. Activities of concern include: chemical threats; sewage; changes in water temperature, salinity and dissolved oxygen; suspended sediment and activities that involve dredging and the disposal of dredged material. There is more and more evidence that changes in water quality resulting from increasing acidification and water temperature could have potentially negative cumulative impacts on the scallop resource and fishery. In addition, researchers have observed tunicate growing over larger portions of Georges Bank. These invasive species may have negative impacts on the resource and fishery if they spread in critical areas for the fishery.

Impacts of non-fishing activities on all the VECs that were considered in this EIS were evaluated to be low to moderately negative. This action is not expected to change the impacts on the VECs described above from non-fishing impacts. Therefore, the combined impacts of non-fishing impacts in concert with the impacts of the proposed action in each VEC is still low to moderately negative.

Table 116 – Summary of effects from non-fishing activities

Action	Description	Impacts on Scallops	Impacts on Physical Env and EFH	Impacts on Protected Species and non-target species	Impacts on Fishery and Communities (including Other Fisheries)
P,Pr,RFFA Vessel operations, marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**No Impact at Site**	**Potentially Negative Inshore** – may lead to destruction of habitat	**Negative at Site** – inshore species impacted by reduced water quality and haul out activity	**Potentially Negative** if loss of fishing opportunities occur
P, Pr, RFFA Beach nourishment, dredge and fill activities	Offshore mining of sand for beaches Placement of sand to nourish beach shorelines	**Negative at Site** – entrainment, sedimentation and turbidity impacts to fish in area in and around borrow site **Negative at Site** – may displace fish, remove benthic prey and increase mortality of early life stages	**Negative at Site** – may lead to destruction of habitat in and around borrow site **Negative at Site** – may result in burial of structures that serve as foraging or shelter sites	**Negative at Site** – mining activity increases noise and reduces water quality **Negative at Site** – turtles susceptible to impacts from beach nourishment	**Negative at Site** – potential loss of fishing opportunities **Positive at Site** – restoration of an eroding shore may protect or restore recreational beaches
P, Pr, RFFA Pollution/water quality	Land runoff, precipitation, atmospheric deposition, seepage, or hydrologic modification Point-source discharges	**Negative at Site** – impacts primarily inshore	**Negative at Site** – impacts primarily inshore, leads to destruction of habitat and EFH	**Negative at Site** – inshore species impacted by impaired biological food chain and poor water quality due to nutrient loading	**Negative at Site** – potential loss of fishing opportunities, human health issues
P, Pr, RFFA Agriculture and timber harvest runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Negative at Site** – impacts primarily inshore	**Negative at Site** – impacts primarily inshore, leads to destruction of habitat	**Negative at Site** – inshore species impacted by impaired biological food chain and poor water quality due to nutrient loading	**Negative at Site** – potential loss of fishing opportunities
P, Pr, RFFA Pesticide application	Substances that are designed to repel, kill, or regulate the growth of undesirable biological organisms	**Negative at Site** – impacts primarily inshore	**Negative at Site** – impacts primarily inshore, leads to destruction of habitat and EFH	**Negative at Site** – inshore species impacted by impaired biological food chain and poor water quality due to nutrient loading	**Negative at Site** – potential loss of fishing opportunities, human health issues
P, Pr, RFFA Water intake structures/ discharge plumes	Withdrawal of estuarine and marine waters by water intake structures	**No Impact**	**Potentially Low Negative at Site** - discharge plumes may affect local oceanographic conditions	**Negative at Site** – intake structures can entrap protected species	**No Impact**
P, Pr, RFFA Loss of coastal wetland	Urban growth and development Development activities within watersheds and in coastal marine areas	**Potentially Low Negative at Site** – may result in habitat degradation	**Potentially Low Negative at Site** – may result in habitat degradation	**Negative at Site** – results in habitat loss for fish species that represent prey items and may result on habitat degradation potentially affecting nesting sites	**Potentially Low Negative at Site** – may result in biomass declines if spawning, health, or mortality are affected

Action	Description	Impacts on Scallops	Impacts on Physical Env and EFH	Impacts on Protected Species	Impacts on Fishery and Communities (including Other Fisheries)
P, Pr, RFFA Loss of coastal wetland	Urban growth and development Development activities within watersheds and in coastal marine areas	**Potentially Low Negative at Site** – may result in habitat degradation	**Potentially Low Negative at Site** – may result in habitat degradation	**Negative at Site** – results in habitat loss for fish species that represent prey items and may result on habitat degradation potentially affecting nesting sites	**Potentially Low Negative at Site** – may result in biomass declines if spawning, health, or mortality are affected
P, Pr, RFFA Road building and maintenance	Paved and dirt roads Poorly surfaced roads can substantially increase surface erosion	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data
P, Pr, RFFA Flood control/ shoreline stabilization	Protection of riverine and estuarine communities from flooding events Dikes, levees, ditches, or other water controls	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data
P, Pr, RFFA Utility lines/cables/ pipeline installation	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Negative at Site** – impacts primarily inshore	**Negative at Site** – impacts primarily inshore, leads to destruction of habitat	**Negative at Site** – dredging activity increases noise and may lead to mortality or injury of protected species	**Negative** – potential loss of fishing opportunities
P, Pr, RFFA Oil and gas exploration/ development	General exploration and development, as well as hydrocarbon spills associated with the transportation, loading and offloading of oil and gas products	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data
P, Pr, RFFA Exotic Species	Introduction of non-indigenous and reared species	**Potentially Negative**- while no direct evidence exists, it is likely that invasive species may affect overall ecosystem health and the biomass of marketable species	**Potentially Negative**- exotic species (ex., tunicates) found to adversely impact EFH and displace marketable and forage species	**Potentially Negative**– ecosystem effects of non-native species	**Potentially Negative**- while no direct evidence exists, it is likely that invasive species may affect overall ecosystem health and the biomass of marketable species
P, Pr, RFFA Marine Mining	Offshore mining as well the mining of gravel from beaches	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data	**Potentially negative –** no data
P, Pr, RFFA Low and mid- Frequency Sonar	Used in military exercises; considered a potential source of serious injury and mortality	**Potentially negative** – may negatively impact species in immediate vicinity of exercises using sonar	**No impact**	**Potentially Negative**- literature documents cetacean mortalities in vicinity of exercises using sonar	**Potentially negative** – potential loss of fishing opportunities, but exercises related to national security
RFFA National Offshore	Legislation would grant DOC authority	**Potentially negative**- may	**Potentially negative**- may	**Potentially negative** - may be	**Potentially neutral** - may be positive for

Action	Description	Impacts on Scallops	Impacts on Physical Env and EFH	Impacts on Protected Species	Impacts on Fishery and Communities (including Other Fisheries)
Aquaculture Act of 2005 (currently proposed)	to issue permits for offshore aquaculture in federal waters	negatively impact species by reducing water quality near aquaculture sites	negatively impact habitat by reducing water quality near aquaculture sites	negative if activities result in interactions with protected species	communities near sites; negative if prices of commercially harvested fish are impacted
RFFA Liquefied Natural Gas (LNG) terminals - several LNG terminals are proposed, including RI, NY, NJ and DE (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore	**Potentially Negative**– short-term disruption of habitat during construction could negatively impact organisms	**Negative** - habitat negatively impacted during construction phase and when vessels anchor to offload gas	**Negative** – may disrupt protected species during construction through increased noise and poor water quality	**Negative** - security zones around LNG facilities restrict access to fishing areas Positive – location of LNG facilities offshore may protect or improve communities
RFFA Offshore Wind Energy Facilities - several facilities proposed from ME through NC, including off the coast of NY/NJ and VA (w/in 5 years)	Construction of wind turbines to harness electrical power	**Potentially Negative**– short-term disruption of habitat during construction could negatively impact organisms	**Negative** – habitat negatively impacted during construction phase	**Potentially Negative**– may disrupt protected species during construction through increased noise and poor water quality	**Negative** – if fishing activity is precluded in area where turbines are located Negative – aesthetic impacts **Positive** – renewable clean energy resource
SUMMARY OF IMPACTS OF NON-FISHING ACTIVITIES – Overall, impacts are variable but greatest on the physical environment and EFH, but found to be low to moderately adverse; lack of data precludes more in-depth analysis of impacts on other VECs		**Potentially Negative**	**Potentially Negative**	**Potentially negative**	**Potentially Negative**

5.7.8 Cumulative Effects Analysis

Below is a description of the expected cumulative effects of the measures under consideration for Framework 22.

First is a summary paragraph related to the direct and indirect impacts of Framework 22 measures on each VEC. This description is based on the information provided in Table 117, a summary of the direct and indirect impacts of the measures under consideration on each VEC (scallop resource, EFH, protected resource, fishery related businesses and communities and other fisheries). The proposed action is in **boldface**.

For each VEC, there is also a summary paragraph describing the cumulative effects of the measures under consideration in terms of how the past, present and reasonably foreseeable future actions impact each VEC, as well as non-fishing activities and direct/indirect impacts of Framework 22. This discussion for each VEC is based on information summarized in previous sections and tables on the past, present, and reasonably foreseeable future actions, non-fishing impacts, and direct and indirect impacts of Framework 22.

Lastly, there is a summary of the cumulative effects of the proposed action only, in terms of the magnitude and extent of cumulative impacts on a VEC-by-VEC basis in combination with other actions (past, present, and reasonably foreseeable future actions) as well as the effects from non-fishing actions (5.7.8.1).

Scallop Resource

Summary of direct and indirect impacts on the scallop resource (Table 117)

Framework 22 was approved at the November 2010 Council meeting, and implementation is expected in summer 2011. It sets the fishery specifications for fishing years 2011 and 2012, with default measures for 2013 intended to be replaced by the next specifications package. FW22 allocates 32 DAS in 2011 and 34 DAS in 2011 which is slightly lower than status quo and No Action. The proposed action maintains access area trips at four, was designed to allocate as much scallop effort through trip allocations in an area as possible, which is beneficial for the resource. The RSA priorities chosen by the Council in this action should improve research done with RSA funding which has indirect beneficial impacts on the resource. The majority of Framework 22 measures are expected to have positive, neutral, or uncertain impacts on the resource.

Summary of cumulative effects on the scallop resource

In terms of past and present actions such as the Scallop FMP, Amendment 4, and Amendments 10 and 11, there have been positive effects on the scallop resource. Other past EFH actions and actions in other FMPs have had neutral or positive effects as well (Table 114). In terms of reasonably foreseeable future actions, Amendment 15 is expected to have positive impacts on the scallop resource (See Amendment 15 document, NEFMC, 2010). There are also several EFH, protected resources and other fishery-related actions that are expected to have either no impact or potentially positive impacts. Therefore, the overall effects of reasonably foreseeable future actions on the scallop resource are potentially positive (Table 115). In addition, the effects of non-fishing activities on the scallop resource are mostly potentially negative (Table 116). Lastly, the direct and indirect effects of the measures under consideration in Framework 22 are expected to have positive to neutral impacts on the scallop resource (Table 117). Thus, when the direct and indirect effects of the alternatives are considered in combination with all other actions (*i.e.*, past, present, and reasonably foreseeable future actions), the cumulative effects should yield non-significant impacts on the scallop resource.

Physical Environment / EFH

Summary of direct and indirect impacts on EFH (Table 117)

The potential impacts on EFH from each of the proposed measures are described within Section 5.2. Although scallop dredges have been shown to be associated with adverse impacts to some types of bottom habitat (NEFMC 2003), no measure contained in this Framework is likely to increase adverse impacts to areas designated EFH relative to the No Action alternative. Framework 22 allocates fewer open area DAS than past actions which should have positive impacts on the resource because there will be less bottom time. Essential fish habitat (EFH) closed areas under the Scallop FMP were changed under the proposed action in Amendment 15, so Framework 22 specifications imply increased access to areas that were previously closed to the scallop fishery. Thus benefits for EFH are expected if more effort can be used in areas with higher catch rates. Overall, Framework 22 is expected to have neutral to positive impacts on EFH and the physical environment.

Summary of cumulative effects on EFH

In terms of past and present actions such as the Scallop FMP, Amendment 4, and Amendments 10 and 11, there have been positive effects on EFH. Other past EFH actions and actions in other FMPs have had mostly positive effects as well (Table 114). In terms of reasonably foreseeable future actions, there are several EFH actions that may have potentially positive effects on EFH. In addition, there are several reasonably foreseeable future scallop and other fishery-related actions that are expected to have no impact on EFH. Therefore, the overall effects of reasonably foreseeable future actions on EFH are neutral to potentially positive (Table 115). In addition, the effects of non-fishing activities on EFH are negative (Table 116). Lastly, the direct and indirect effects of the measures under consideration in Framework 22 are expected to have neutral to positive impacts on EFH. Thus, when the direct and indirect effects of the alternatives are considered in combination with all other actions (*i.e.*, past, present, and reasonably foreseeable future actions), the cumulative effects should yield non-significant neutral to positive impacts on EFH.

Protected Resources

Summary of direct and indirect impacts on protected resources (Table 117)

Most alternatives under consideration in Framework 22 have neutral or potentially positive direct impacts on threatened and endangered sea turtles when compared to No Action. The RPM alternative to limit the amount of trips in the Mid-Atlantic at the time when turtles are most likely to be present has somewhat uncertain impacts overall, but they are potentially positive.

In terms of the priorities in the research set-aside program, there are indirect beneficial impacts on protected resources if research results in more knowledge of the interactions of the scallop fishery and protected resources. Numerous turtle-related research projects have been funded through the Scallop RSA program to date, and that topic is a high priority for future research proposals. In addition, much of the information known about when and where interactions have occurred are from data collected through the observer set-aside program. So both these programs are expected to have continued indirect benefits on protected resources. The specific impacts on protected resources from each of the proposed measures are described within Section 5.3. Overall, Framework 22 will limit the amount of access area effort that can be used in the time and area where sea turtle takes have been observed. This direct limit on the amount of fishing that can take place in the Mid-Atlantic during the turtle season is expected to have beneficial impacts on sea turtles.

<u>Summary of cumulative effects on protected resources</u>
Sea turtles, have been, are, and will continue to be, negatively impacted by a variety of past, present, and reasonably foreseeable future activities which may be affecting the recovery of the species. The extent to which this may be happening cannot be quantified at this time but is potentially negative. As noted above, however, the measures presented in this action are unlikely to alter the impacts that occur as a result of both fishing and non-fishing activities but may positively impact some currently negative effects by limiting the amount of limited access effort that can take place in Mid-Atlantic access areas.

In terms of past and present actions, there have been positive to neutral effects on protected resources (Table 114). In terms of reasonably foreseeable future actions, there are several protected resource related actions that may have positive effects on protected resources. In addition, there are several reasonably foreseeable future scallop and other fishery-related actions that are expected to have potentially positive impacts on protected resources. The activities that are negatively impacting sea turtles will continue to be addressed through fishery management plans as well as by the agency to ensure sea turtles are protected. One of the goals of NMFS's Sea Turtle Strategy is to develop and implement plans to reduce takes of sea turtles in Atlantic Ocean and Gulf of Mexico fisheries. Implementation of these plans will have a net beneficial impact on sea turtle species. NMFS also intends to continue outreach efforts to educate fishermen regarding sea turtles. Future anticipated research will likely enhance knowledge concerning the nature of the interactions between sea turtles and sea scallop dredge gear, potentially leading to the implementation of alternative management measures that may confer benefits to animals in areas where overlap with the fishery occurs. Therefore, the overall effects of reasonably foreseeable future actions on protected resources are neutral to potentially positive (Table 115). In addition, the effects of non-fishing activities on protected resources are potentially negative (Table 120).

Lastly, the direct and indirect effects of the measures under consideration in Framework 22 are expected to have mostly neutral to positive impacts on protected resources (Table 117). Thus, when the direct and indirect effects of the alternatives are considered in combination with other actions (*i.e.*, past, present, and reasonably foreseeable future actions), the cumulative effects should yield neutral non-significant impacts.

Fishery-Related Businesses and Communities
<u>Summary of direct and indirect impacts on fishery-related businesses and communities (Table 117)</u>
The aggregate economic impacts of the proposed measures and other alternatives including access area allocations, proposed Great South Channel area closure, open area DAS allocations, general category measures, and RPM alternatives are analyzed in Section 5.4 relative to No

Action and Status quo alternatives. The combined impacts of the proposed area rotation and DAS measures are expected to be positive compared to No Action both in the short- and the long-term. The impacts of the proposed action on scallop fleet revenues and economic benefits are expected to be slightly negative in the short term, however, compared to 2009-2010 and SQ levels, but positive over the long-term.

The analysis of the fleet-wide aggregate economic impacts indicated that the proposed action will have positive economic impacts compared to the no action levels both in the short-term (2011-2012) and the long-term (2011-2022). This comparison does not accurately reflect the changes compared to the recent levels of revenues and economic benefits, however. No action would result in fewer actual access area trips compared to 2010, thus would result in significantly lower revenues ($364.5 million) compared to the actual revenues in 2009 ($379.5 million) and in 2010 (estimated to be about $431 million, Table 84). The estimated fleet revenue for the proposed action (Alt 1) is $399.1 in 2011 and $428.4 million in 2012 (Table 84). Therefore, when compared with no action, the proposed action will result in increase in fleet revenues by $34.6 million in 2011 and by $138 million.

In terms of the impacts on fishery related businesses and communities, it is also important to examine how the proposed action would change the scallop revenues and economic benefits from the recent levels. The status quo alternative is a better baseline from this perspective because it assumes that there will be no changes in allocations from their levels in 2010. Total fleet revenue is estimated to be $433.4 million in 2011 for SQ, a level which is quite similar to the estimated revenue in 2010 ($431 million). The revenue for the SQ alternative was estimated to be $446.8 million in 2012. On the other hand, the average revenue for the 2009-2010 fishing years was $405.3 million.

The estimated fleet revenue for the proposed action (Alt 1) is $399.1 in 2011 and $428.4 million in 2012. Therefore, proposed action revenues will be about $34.3 million ($18.4 million) lower than the status quo revenues in 2011 (2012). Therefore, the proposed action will have potentially negative impacts on the fleet revenues and incomes of the fishing communities in 2011 compared to SQ alternative and 2010 levels. The impacts on the consumer and producer surpluses and total economic benefits are proportional to the impacts on fleet revenues and as such, they would be lower in the short-term under the proposed action compared to the SQ and 2010 levels.

Scallop revenues skyrocketed in 2010, however, as prices increased due to changes in external factors (problems with Japanese scallop industry, decline in the value of dollar) and as landings increased due to higher than expected scallop productivity (LPUE). If instead of this peak year, the comparison is based on the average revenues ($405.3 million) for 2009-2010 fishing years, the negative impacts of the proposed action on revenues in 2011 (by $6.2 million =$399.1 million – $405.3 million) would be small and the proposed action revenues in 2012 would be larger than the average revenues in 2009-2010 (by $23.1 million=428.4 million-405.3 million).

The combined actions proposed by Framework 22 are expected to increase fleet revenues, profits and total economic benefits compared to both No Action and the SQ alternative in the long-term, however. Overall revenues for proposed action (Alt1) are expected to exceed the no action revenues by $122.8 million to $132.5 million and the SQ revenues by $19.8 million to $33.5 million for the overall period from 2011 to 2022 depending on whether a 7% or a 3% discount rate is used (Table 86 and Table 87). The present value of the cumulative economic benefits for the proposed action (Alt.1) would exceed the benefits for No Action by $136.5 million ($126.1 million), SQ benefits by $36.7 million ($22.8 million) using a 3% discount rate (7% discount rate) over the long-term from 2011 to 2022 (Table 86 and Table 87).

Specifications of precautionary measures for 2013 are expected to have potentially positive economic impacts. The allocations of split (half) trips to access areas with biomass levels not large enough to support a full trip will increase landings, revenues and total economic benefits from the fishery. The administration of the lottery is expected to have positive economic impacts on the fishermen since it will provide flexibility for the vessels to trade access area trips, thus to use fully the access area trip allocations. The yellowtail accountability measures adopted under Amendment 15 could increase fishing costs and could have negative impacts on the scallop revenues and profits if the effort is moved to less productive areas with lower LPUE and to areas with a higher percentage of smaller scallops that are usually sold at a lower price compared to larger scallops. Implementation of the closure in the subsequent year, rather than in-season, will however prevent derby style fishing and minimize the negative impacts on prices and revenues associated with it.

The economic impacts of the proposed measures for the limited access general category (LAGC) vessels are expected to be positive both in the short- and the long-term compared to the no action alternative since the TAC for the LAGC fishery will be higher than the no action values. Set-asides for observer coverage and research is expected to have indirect economic benefits by improving scallop management through better data and information made possible by timely research into current issues in the fishery. The elimination of the GB access area rotation schedule and the opening and closing of access areas in the regulations will reduce confusion and administrative burden with positive economic impacts.

The proposed action will limit the maximum number of trips that can be taken in the Mid-Atlantic areas from June 15 to October 31st one trip per vessel in order to comply with the March 2008 Atlantic Sea Scallop FMP Biological Option as it relates to sea turtles. In addition, because the effort is shifted to a relatively less productive season, total fleet trip costs are expected to increase slightly by $26,583, in 2011 and by $28,423 in 2012 (Table 74? and Table 75?). Since there is no change in the possession limit, the trips that are shifted from this season are expected to be taken outside of the turtle window, without a loss in total revenue. The proposed action is expected to minimize the effort shift from the turtle window compared to the other alternatives considered by the Council, thus is not expected to have a significant impact on prices, revenues and total economic benefits.

Other measures (such as NGOM and incidental catch TAC) that are discussed in Framework 22 are measures that were implemented with earlier actions, including Framework 21 and Amendment 11. As a result, they will not change economic benefits for the fishery-related businesses and communities.

<u>Summary of cumulative effects on fishery-related businesses and communities</u>

The cumulative impacts of the past actions including Amendment 4, Amendment10, Framework 18 and Amendment 11, Amendment 15, Framework 19, Framework 20 and Framework 21 to the scallop FMP, are estimated to be neutral to positive over the long-term. Adjustment of the open area DAS allocations, implementation of trip limits and allocations for the access areas and rotation area management implemented by the past management actions had positive impacts on the scallop industry by increasing the revenues, producer and consumer surpluses and net benefits in the past. The measures implemented by the recent Framework action (Framework 21) are estimated to have positive impacts on consumer, producer and total economic benefits in 2010 exceeding the estimated values of economic benefits in Framework 21 document. Due to higher than expected landings in 2010 (about 55 million actual landings compared to 47 million estimated in Framework 21) coupled with higher prices than projected, scallop fleet revenues in 2010 ($431 million) is estimated to exceed the levels in 2009 ($379.5 million) by $51.5 million. The estimated revenues for the proposed action in Framework 22 is about $399.3 million in 2011, which is $31.7 million less than the revenues in 2010. Because the positive impacts in 2010 ($51.5 million in 2010) exceed the slightly negative impacts in 2011 from Framework 22 measures ($31.7 million compared to the level in 2010), the net cumulative impacts of the proposed measures and the past actions would be positive ($51.5 milllion-$31.7 million=$19.8 million) in the short-term as well. Other past EFH actions and actions in other FMPs have had neutral or low negative effects (Table 114).

In terms of reasonably foreseeable future actions, there are several scallop related actions that are expected to have positive impacts overall. There are also several EFH, protected resources and other fishery-related actions that are expected to have potentially positive or low negative impacts on fishery-related businesses and communities. Therefore, the overall effects of reasonably foreseeable future actions on the fishery-related businesses and communities are neutral (Table 115). In addition, the effects of non-fishing activities on the fishery-related businesses and communities are mostly potentially negative (Table 116).

Lastly, the direct and indirect effects of the measures under consideration in Framework 22 are expected to have neutral to potentially positive impacts on the fishery-related businesses and communities overall (Table 117). The actions proposed by Framework 22 are expected to increase fleet revenues, profits and total economic benefits compared to both no action and the SQ alternative over the long-term from 2011-2012. As a result, cumulative economic benefits, which measure the sum of benefits from previous and proposed actions, are expected to be positive.

Thus, when the direct and indirect effects of the alternatives are considered in combination with other actions (*i.e.,* past, present, and reasonably foreseeable future actions), these actions yield non-significant neutral to potentially positive cumulative impacts on the fishery-related businesses and communities.

Non-Target Species

<u>Summary of direct and indirect impacts on non-target species (Table 117)</u>

None of the measures included in the proposed action are expected to have significant impacts on non-target species. This action has considered the potential impacts of the alternatives under consideration on non-target species (small scallops as well as finfish and other bycatch species) and in general, all the measures under consideration have positive or neutral impacts on non-target species. Since the Scallop FMP in general strives to allocate fishing effort in areas with high scallop catch per-unit-of-effort, impacts on bycatch are reduced. Framework 22 to the scallop plan, fishery specifications for 2011 and 2012, will be similar to recent years or even a reduction in effort, thus neutral to potentially positive impacts on non-target species. Overall, primarily neutral impacts expected from Framework 22 measures on non-target species.

<u>Summary of cumulative effects on non-target species</u>
The combined effects of past actions in the scallop FMP have decreased effort and improved habitat protection, which benefits non-target species. In addition, current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species. Finally, future actions are anticipated to continue rebuilding and thus limit the take of discards/bycatch in the scallop fishery, particularly through ACL management with AMs for YT flounder. Overall, continued management of directed stocks will also control catch of non-target species. In addition, the effects of non-fishing activities on protected resources are potentially negative (Table 120). Overall, the cumulative effects should yield non-significant neutral to positive impacts on non-target species.

Other Fisheries
<u>Summary of direct and indirect impacts on other fisheries (Table 117)</u>
The majority of alternatives in this action will not have direct impacts on other fisheries. The allocation alternatives proposed in this framework are similar to recent landings and area swept values and therefore impacts on other fisheries should be neutral, no additional impacts.

<u>Summary of cumulative effects on other fisheries</u>
In terms of past and present actions in the Multispecies, Monkfish, and Summer flounder/Black Sea Bass and Scup FMPs, there have been positive effects on other fisheries. Past EFH actions and actions in the Scallop FMP have had neutral effects (Table 114). In terms of reasonably foreseeable future actions, most have neutral to potentially positive impacts on other fisheries (Table 115). In addition, the effects of non-fishing activities on other fisheries are mostly potentially negative (Table 116). Lastly, the direct and indirect effects of the measures under consideration in Framework 22 are expected to have neutral impacts on other fisheries overall (Table 117). Thus, when the direct and indirect effects of the alternatives are considered in combination with other actions (*i.e.*, past, present, and reasonably foreseeable future actions), the cumulative effects should yield non-significant neutral to positive impacts on other fisheries.

Table 117– Effects of alternatives under consideration on the five Framework 22 VECs; proposed action is in bold

Alternative	Description	Scallop Resource	Physical Environment/EFH	Fishery-related Businesses and Communities	Protected Resources and Non-target Species	Other Fisheries
2.3 Acceptable Biological Catch	No Action and proposed ABC levels	**Positive**	**Neutral**	**Positive**	**Neutral**	**Neutral**
2.4 Allocation Alternatives						
No Action	38 DAS and 4 trips in 2011 and 2012	Negative	Low negative	Low negative	Low negative	Neutral
Alternative 1 and 2	**Alt 1, the proposed action allocates 32 DAS in 2011 with 4 access trips, and 34 DAS in 2012 with 4 access trips.** Option 2 is very similar but does not split trips across the fleet.	**Positive**	**Positive**	**Positive**	**Positive**	**Neutral**
Alternative 3	Option 3, GSC Closure	Low positive	Low positive	Low negative	Neutral	Neutral
2.6.1 Allocation for LAGC IFQ vessels	**LAGC receives 5.5% of overall fishery ACL**	**Neutral**	**Positive**	**Positive**	**Neutral**	**Neutral**
2.6.2 NGOM Hard TAC	**TAC of 70,000 pounds, status quo**	**Neutral**	**Neutral**	**Low positive**	**Neutral**	**Neutral**
2.6.3 Incidental catch	**50,000 pounds, status quo**	**Neutral**	**Neutral**	**Low positive**	**Neutral**	**Neutral**
2.7 TAC set-asides for research and observers						
2.7.2 Set-asides	**1.25 million pounds for research (A15) and 1% for observers**	**Indirect low positive**	**Indirect low positive**	**Indirect low positive**	**Indirect low positive**	**Neutral**
2.7.2.3 Research priorities for 2012 and 2013	**A host of mostly minor changes and updates were made to RSA priorities**	**Indirect low positive**	**Indirect low positive**	**Indirect low positive**	**Indirect low positive**	**Neutral**
2.9.1 Turtle RPMs						
2.9.1.1 No Action	FW21 measures would expire and RPM would not be in place	Neutral	Neutral	Neutral	Potentially low negative for protected resources	Neutral

Alternative	Description	Scallop Resource	Physical Environment/EFH	Fishery-related Businesses and Communities	Protected Resources and Non-target Species	Other Fisheries
					Neutral for non-target species	
2.9.1.2 Restrict the number of open area DAS a vessel can use between July and September in the Mid-Atlantic	A vessel could only use 1 trip during this period unless they traded up to four trips in which case they could use 2	Uncertain – non-significant	Uncertain – non-significant	Low negative, especially to small vessels homeported in the Mid-Atlantic	Potentially Positive for protected resources Uncertain – non-significant for non-target species	Neutral
2.9.1.3 Restrict the number of access area trips in the MA that can be used between June 15-Oct 31	**A vessel could only use 1 trip during this period unless they traded up to four trips in which case they could use 2**	**Uncertain – non-significant**	**Uncertain – non-significant**	**Low negative, especially to small vessels homeported in the Mid-Atlantic**	**Potentially Positive for protected resources Uncertain non-significant for non-target species**	**Neutral**
2.9.1.4	Seasonal closure for Delmarva	Potentially positive	Potentially low positive	Neutral to low negative	Low positive for protected resources Uncertain – non-significant for non-target species	Neutral
2.9.1.5	Seasonal closure for Hudson Canyon in 2012 and 2013	Potentially positive	Potentially low positive	Neutral to low negative	Low positive for protected resources Uncertain – non-significant for non-target species	Neutral
2.9.1.6	Combined measures – limited trips and seasonal closure in Delmarva OR seasonal closure in Delmarva and HC in 2012 and 2013	Potentially positive	Potentially low positive	Neutral to low negative	Low positive for protected resources Uncertain – non-significant for non-target species	Neutral
2.10 Modifications to VMS	The measure seeks to create a way to turn the VMS off if it does not intend to land scallops.	Neutral	Neutral	Low positive	Neutral	Neutral
2.11 Re-visit bushel possession limit seaward of demarcation line	Some value other than 100 bushels may be considered.	Potentially low positive	Neutral	Potentially low negative	Neutral	Neutral

Alternative	Description	Scallop Resource	Physical Environment/EFH	Fishery-related Businesses and Communities	Protected Resources and Non-target Species	Other Fisheries
2.12 Extension of unused ET trips	Full-time vessels could use any unused FY 2010 ETA trips through May 30, 2011 because of low catch rates	Potentially low positive	Potentially low positive	Potentially low positive unless it triggers AMs in 2012, then negative	Neutral	Neutral
2.13 Eliminate schedule of GB access areas in regulations	**Eliminate any reference to the three-year schedule of access areas on GB**	**No impact - Administrativ e**	**No impact - Administrative**	**Potentially low positive**	**No impact - Administrative**	**No impact- Administrat ive**
Summary of Impacts		**Neutral to Potentially Positive**	**Neutral to Positive**	**Potentially positive**	**Neutral to potentially low Positive**	**Neutral**

5.7.8.1 Summary of Cumulative Effects of the proposed action

To determine the magnitude and extent of cumulative impacts of the proposed action, the incremental impacts of the direct and indirect impacts should be considered, on a VEC-by-VEC basis, in addition to the effects of all actions (those effects identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions). In general, while the management measures proposed result in cumulative impacts in some cases, none of the impacts discussed indicate a potentially significant impact. Section 5.7.8 above summarizes the expected cumulative effects of the measures that were considered in this action; this section focuses on the proposed action only.

Overall, the cumulative effects of the proposed action should yield non-significant neutral to low positive impacts. Table 118 summarizes the cumulative effects of the proposed action relative to the past, present, and reasonably foreseeable future fishing and non-fishing actions for each of the VECs considered. In general, the impacts of the past, present, and reasonably foreseeable future actions on all of the VECs identified in this action are positive to neutral, but non-significant impacts. There are several future actions that may have potential low negative or positive impacts, but overall the expected impacts are neutral and non-significant. Furthermore, there are potentially negative impacts of non-fishing activities in this region on the various VECs identified. As for the direct and indirect impacts of the proposed action on each VEC, the overall impacts are expected to be positive to neutral, and non-significant.

Table 118 – Summary of cumulative effects of the proposed action

	Scallop Resource	**Physical Habitat/EFH**	**Protected Resources and non-target species**	**Fishery-Related Businesses and Communities**	**Other Fisheries**
Direct/Indirect Impacts of Proposed Action	Potentially Positive to Neutral	Neutral to Positive	Neutral to Potentially positive	Potentially Positive / Neutral	Neutral
Past and Present Fishing Actions Impacts	Positive	Positive	Positive/Neutral	Mostly Positive	Positive/Neutral
Reasonably Foreseeable Future Fishing Actions Impacts	Neutral to Potentially Positive	Potentially Positive	Neutral to Potentially Positive	Mostly Positive	Neutral to Potentially Positive
Non-Fishing Actions Impacts	Potentially negative	Potentially negative	Potentially negative	Potentially negative	Potentially negative
Cumulative Effects	Non-significant Positive	Non-significant Neutral to Positive	Non-significant Neutral to Positive	Non-significant Neutral to Positive	Non-significant Neutral to low positive

6.0 COMPLIANCE WITH APPLICABLE LAW

6.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

6.1.1 National standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery management plans (FMPs) contain conservation and management measures that are consistent with the ten National Standards:

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

All three FW22 alternatives were developed by the PDT to meet the goals of the FMP to prevent overfishing. In this framework, a new overfishing definition is being used based on what the Council selected in Amendment 15. DAS allocations for 2011 and 2012 were set at $F = 0.38$ (SAW 50, NEFSC 2010) in open areas – the F rate equivalent to OFL to prevent overfishing. Under the hybrid overfishing definition selected in Amendment 15, the maximum level that open area fishing can be set is 0.38. In access areas, F will be set no higher than the time-averaging principle (so that F may be higher than the overfishing threshold in some access areas at certain times to compensate for zero F when the area was closed). The spatially combined target fishing mortality must be no higher than the ABC control rule set in Amendment 15; a fishing mortality rate that gives a 25% probability of exceeding the ABC fishing mortality.

In this action the Council had available updated estimates of fishing mortality for 2008 and 2009, and a preliminary estimate for 2010. Fishing mortality has been higher than F_{target} for the past three fishing years, and F in 2009 was equal to the OFL. The PDT has improved the assumptions and models used to set F_{target} primarily based on adjustments made to how fishing mortality is estimated from open area DAS to accommodate for increases in LPUE.

Adjustments for both an increase in LPUE and to account for a previous overestimation in the number of active vessels assumed to fish in the fishery have been made, which will reduce management uncertainty and increase the probability of achieving catch targets. Modifications have been made based on work the PDT did for developing alternatives in Amendment 15 to comply with new annual catch limit (ACL) requirements. To take this into account, the FW22 analysis included an adjustment to the model for calculating DAS to more accurately reflect the landings per-unit-effort (LPUE) value. Since vessel productivity can only increase so much, and is confined by a crew limit, the Council and PDT are confident that the current estimate of catch per DAS is reaching the actual value based on the fact that the fishery cannot keep increasing LPUE indefinitely and the estimates are getting closer to reports the industry has provided at meetings. These improvements are combined with the new stock assessment update and overfishing definition from Amendment 15. Based on these improvements, it is likely that projected targets used in FW22 will be closer to realized landings and fishing mortality compared to projections used in previous frameworks. Considering the updated hybrid OFD with spatially averaged F, overfishing is highly unlikely.

In terms of achieving optimum yield, this action is expected to attain maximum catch levels from access areas under the proposed “split trip” alternative. In the past full integer trips have been allocated to the fleet in access areas, so in some cases additional catch may be available in an area, but not enough to support an additional trip to the entire fleet. Under the proposed action, half the fleet will be allocated a trip in one area, and half the fleet in a different area. This will assure optimum yield by allocating maximum scallop effort in areas with highest scallop concentrations reducing impacts on EFH and bycatch.

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

This document uses information of known quality from sources acceptable to the relevant scientific and technical communities. Several sources of data were used in the development of this document. These data sources include, but are not limited to: permit data, landings data from vessel trip reports, data from the dealer weighout purchase reports, scallop survey data, and data from at-sea observers. Although there are some limitations to the data used in the analysis, these data are considered to be the best available.

In addition, the biological projections are based on the CASA model that is expected to generate more accurate results using a wide variety of data sources. The CASA model was reviewed and approved for management use in the 2007 scallop assessment. This in addition to the Scallop Area Management Simulator (SAMS) model and Swept Area Seabed Impact (SASI) model used for habitat analysis are current, peer-reviewed modeling methods. Lastly, the Council’s SSC reviewed and approved the Acceptable Biological Catch (ABC) for this fishery for 2011 and 2012 based on updated analyses of biological uncertainty in the parameters used to assess the scallop resource. All of these models were updated for status determination and development of new reference points in June 2010 at the Stock Assessment Workshop in Woods Hole, MA (NEFSC, 2010). Therefore, this is considered the best available science to set MSY in order to prevent overfishing.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Under the Atlantic Sea Scallop FMP, the target fishing mortality rate and stock biomass are applied to the scallop resource from NC to the US/Canada boundary. This encompasses the entire range of scallop stocks under Federal jurisdiction. See Section 4.1 for a description of the scallop resource.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The management measures proposed in this action do not discriminate between residents of different states. This action includes allocation measures, but they do not discriminate between vessels from various states. Limited access vessels are relatively mobile and are expected to fish in various access areas. Limited access vessels are permitted to trade access area trips with other vessels; therefore, if an area is far from their homeport and they do not want to fish in that area, they can trade for a trip closer to their homeport. In 2011 and 2012 there are access areas in the Mid-Atlantic and Georges Bank. The lottery mechanism used to allocated "split fleet" trips has the potential to give Georges Bank trips to vessels homeported in the Mid-Atlantic, but the lottery mechanism was done randomly and again, trip trading is allowed. General category vessels are not allocated individual access into access areas; it is a fleet-wide allocation of trips for that fishery. Thus, general category vessels can decide to participate in an access area program or not. Therefore, if a vessel is relatively small and cannot fish far offshore or travel great distances to fish in an access area, that vessel can fish its allocation in open areas.

Some of the RPM alternatives had the potential to have higher distributional impacts on some vessels homeported from southern states and that is one of the primary reasons the Council did not select those measures as part of the proposed action. Instead a caveat was added to the proposed RPM to prevent this measure from having high distributional impacts on vessels from the Mid-Atlantic and hampering the tradability of access area trips, which is essential to the success of the area rotation program.

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

The Proposed Action should promote efficiency in the utilization of fishery resources by allocating effort in areas with higher catch rates. For example, catch per unit of effort is expected to be higher in access areas; therefore, since more effort is allocated in these areas than open areas under the proposed action, vessels will spend less time, money and fuel on access area trips. In general, area rotation intends to maximize yield and reduce fishing impacts by allocating effort in areas with higher concentrations of scallops.

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

The Proposed Action takes into account variations among and contingencies in fisheries, fishery resources, and catches. This action enhances the ability of the FMP to adapt to changing resource conditions. The access program is expected to allow the FMP to reduce fishing effort in open areas, increasing the scallop biomass in open areas, and potentially allowing the FMP greater flexibility to achieve optimum yield through rotational area management in the future. It was noted that it is desirable for the industry to maintain consistent landings from year to year, and the fishing level chosen will allow for that. Variations in annual catch and allocations are still to be expected under area rotation, a system that is designed to optimize yield from variable recruitment patterns by area and year.

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

The Council considered the costs and benefits associated with the Proposed Action when developing this action. The proposed action does not introduce any new measures that duplicate measures already in place. Area rotation and DAS controls were implemented in 1994; the full area rotation program was implemented in June 2004. Both these types of measures are necessary components of the FMP to achieve the annual mortality targets and prevent the stock from becoming overfished. The increase in the average size of scallops landed, a primary objective of both the FMP and the proposed action, continues to be a major factor that minimizes harvesting costs. The management measures proposed in this amendment are not duplicative and were developed in close coordination with NMFS and the Mid-Atlantic Fishery Management Council.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

In the Amendment 10 FSEIS, the characteristics and participation of fishing communities involved in the scallop fishery were discussed in Section 7.1.1.3, and the impacts of rotation area management were discussed in Section 8.8. This document includes an update of fishery and community information in Section 4.4. The economic and social impacts, which affect fishing communities, are analyzed and discussed in Sections 5.4 and 5.5. The proposed action will not change these impacts anticipated under Amendment 10, except that fishing communities near the proposed access areas will benefit from higher landings and economic activity, while fishing communities distant from these areas are likely to experience some adverse social impacts.

The proposed action, however, is not expected to jeopardize the sustained participation of fishing communities that have depended on the scallop resource. The area rotation and DAS adjustments are expected to continue to ensure a healthy resource that will be able to support historical levels of participation by fishing communities.

In the short-term (i.e. fishing year 2011), landings, revenues and economic benefits for the proposed action are much higher than landings and economic benefits for the 'No Action' alternative. As a result, revenues, producer and consumer surpluses, and total economic benefits for the proposed action will be higher than the levels for other alternatives in the short-term (2011 and 2012)(Table 101 to Table 109), and will maintain high levels in the long-term which exceed benefits from the other alternatives. In many respects, the impacts of the proposed action are better than 'No Action' and recent years. One major reason the Council selected the proposed 2011 and 2012 allocations was to maintain the landings stream, thus minimizing short-term economic impacts in these difficult economic times. The proposed action has fewer impacts in 2011and 2012 compared to some of the other options considered.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

Bycatch in the scallop fishery has been greatly reduced and minimized by the success of the FMP to increase scallop biomass and reduce the amount of time fished on a DAS. The FMP has also implemented several gear restrictions that have successfully reduced bycatch. These effects are discussed in detail in Section 6.1.9 of the Amendment 10 FSEIS, and in related sections of that document.

Because the proposed action includes access to areas that are otherwise closed to achieve groundfish conservation, the proposed action in this framework adjustment includes several measures to minimize bycatch and to ensure that groundfish mortality does not increase to a point that it would threaten the rebuilding prognosis for overfished groundfish. These measures include a precautionary TAC for yellowtail flounder (a species vulnerable to capture by scallop dredges) within specific access areas, seasons for access (to avoid peak groundfish spawning months), and enhanced sea sampling made possible from the industry-funded observer program (to monitor and assess bycatch). In addition, the proposed action will continue the regulations to use a minimum 4-inch ring in scallop dredges and a 10-inch minimum twine top. The Amendment 10 analysis showed that both these measures would reduce finfish bycatch by reducing fishing time and allowing greater escapement of small finfish. Also, this framework contains updated research set-aside priorities that include bycatch reduction research. Lastly, an amendment to the Scallop FMP has been implemented to bring the FMP in compliance with SBRM requirements related to sampling discards.

A summary of the impacts of these measures are analyzed and described in Section 5.6. Bycatch of protected species is analyzed in Section 5.3.

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

Section 6.1.10 in the Amendment 10 FSEIS discusses the effect of current scallop management and of rotation area management on safety. This action does not propose any new measures that would change the findings in Amendment 10. Some of the measures related to reasonable and prudent measures (Section 2.8) are expected to potentially shift effort from the Mid-Atlantic and from the summer and fall to the spring and winter. Fishing is dangerous all times of the year, but some of the more restrictions alternatives would limit when vessels could fish in warmer months. The proposed action restricts the limited access fishery to one of the two access area trips in the Mid-Atlantic between June 15 and October 31, so only one trip would need to be taken in the winter and spring. Vessels that trade up to four trips would be permitted to take two of the four during that time window. It should be noted that many vessels fish Mid-Atlantic access areas during the winter and spring as it is due to optimal meat weights at that time, so the proposed action is not expected to have large impacts on fishing behavior, and thus safety at sea.

6.1.2 Other Required Provisions of the M-S Act

Section 303 of the Magnuson-Stevens Fishery Conservation and Management Act contains 14 additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall:

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

Since the domestic scallop fishery is capable of catching and processing the allowable biological catch (ABC), there is no total allowable level of foreign fishing (TALFF) and foreign fishing on sea scallops is not permissible at this time.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

The fishery and fishery participants are described in detail in Section 4.4 of Amendment 11 to the Scallop FMP. Section 4.4 in this document describes the scallop permits by category as well as the active scallop vessels by permit type that could be affected by this action. The number of trips and average scallops landed per category are also included in that section as well.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

The present and probable future condition of the resource and estimates of MSY and OY are given in Section 8.2.2.2 of Amendment 10 to the Scallop FMP. The SSC reviewed the most recent work on assessing this resource and determined that acceptable biological catch be set at 31,288 mt in 2011 and 33,243 mt in 2012 (69.0 and 73.3 million pounds, respectively), including an approximate 4100 mt (9 million pounds) for non-yield fishing mortality (discards and incidental mortality). Therefore, the overall ABC for the fishery, excluding discards and incidental mortality is 27,276 mt in 2011 and 28,968 mt in 2012 (60.1 and 63.9 million pounds, respectively). Acceptable Biological Catch (ABC) is defined as the maximum catch that is recommended for harvest, consistent with meeting the biological objectives of the management plan (Section 0).

This level was recommended by the Science and Statistical Committee (SSC) and various sources of scientific uncertainty were considered when setting this value. ABC calculations were based on the updated hybrid overfishing alternative proposed in Amendment 15. Under this OFD, the overfishing threshold will remain as status quo (spatially averaged $F = 0.38$). The fishing mortality target in the open areas will be set at no higher than the overfishing threshold in the open areas (currently $F = 0.38$). In access areas, it will be set no higher than that given by the time-averaging principle (so that F may be higher than the overfishing threshold in access areas that had been closed). The spatially combined target fishing mortality must be no higher than that which gives a 25% probability of exceeding the ABC fishing mortality. Target fishing mortalities can be set below these limits but not above them.

Current domestic landings and processing capabilities are around 50 million lbs. Total landings have been above that level in some years since 2004, and are expected to be close to 55 million pounds for 2010. Landings under this action are expected to be in a similar range, 52-57 million pounds.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

The US fishery is expected to harvest 100% of OY and domestic processors are expected to be able to process 100% of OY.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, economic information necessary to meet the requirement and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

The FMP and existing regulations specify the type of reports and information that scallop vessel owners and scallop dealers must submit to NMFS. These data include, but are not limited to, the weight of target species and incidental catch which is landed, characteristics about the vessel and gear in use, the number of crew aboard the vessel, when and where the vessel fished, and other pertinent information about a scallop fishing trip. Dealers must report the weight of species landed by the vessel, the date of landing, and the ex-vessel price for each species and/or size grade. Important information about vessel characteristics, ownership, and location of operation is also required on scallop permit applications. Dealers are also surveyed for information about their processing capabilities.

All limited access scallop vessels and general category vessels are required to operate vessel monitoring system (VMS) equipment to record the location of the vessel for monitoring compliance with DAS regulations. An at-sea observer is also placed on scallop vessels at random to record more detailed information about the catch, including size frequency data, the quantity of discards by species, detailed gear data, and interactions with protected species.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

The action proposed in this amendment does not alter any adjustments made in the Scallop FMP that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fisheries. No consultation with the Coast Guard is required relative to this issue.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Essential fish habitat was defined in earlier scallop actions. This amendment does not further address or modify those EFH definitions. There are no additional impacts to the physical environment or EFH expected from the action proposed in this amendment.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

Data and research needs relative to the Atlantic sea scallop and its associated fisheries are described in Section 5.1.8 of Amendment 10 and Section 4.1 of Amendment 15. Other data already collected include fishery dependent data described in Section 6.2.4 of Amendment 10 and Section 4.4 of Amendment 15, and fishery-independent resource surveys that provide an index of scallop abundance and biomass.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants; and (C) the safety of human life at sea, including weather and to what extend such measures may affect the safety of participants in the fishery;

The impacts of the scallop management program in general have been analyzed in previous scallop actions (Amendment 10, Amendment 11, Framework 16, Framework 18, Framework 19, Framework 21 and Amendment 15). Any additional impacts from measures proposed in this action on fishery participants are summarized in Section 5.4. Safety in the scallop fishery was described in Section 8.1.5.6 of Amendment 10 and nothing proposed in this action will affect safety of human life at sea.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

Overfishing reference points describing targets and thresholds for biomass and fishing mortality were updated in 2010 and are presented and explained in Sections 4.1.1and 4.1.3of this document. Under this OFD, the overfishing threshold will remain as status quo (spatially averaged $F = 0.38$). This action is designed to meet the fishing mortality target that has a 25% chance of exceeding the OFL. For this action that is an F of 0.38 in open areas, and F in access areas will be set based on the time-averaging principle (so that F may be higher than the overfishing threshold in access areas that had been closed).

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;

This action does not include changes to the current SBRM. This methodology is expected to assess the amount and type of bycatch in the scallop fishery and help identify ways the fishery can minimize bycatch and mortality of bycatch which cannot be avoided. The scallop fishery also has an industry funded observer set-aside program that provides additional funding (portion of total scallop catch set-aside) to put observers on scallop vessels. A summary of the extent of observer coverage in this fishery can be found in Section 4.5.3.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

This Proposed Action does not address recreational fishing regulations. There are no substantial recreational or charter fishing sections in the scallop fishery. Any recreational scallop fishing is likely conducted by diving, and harvest is by hand, maximizing the survival of released scallops.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery, including its economic impact, and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

A detailed description of the scallop fishery is included in Section 7.1 of Amendment 10, Section 4.4 in Amendment 11, Section 4.4 of Amendment 15, and Section 4.4 of this action. These sections provide information relative to scallop vessels, processors, and dealers.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery; and

This action does not propose a reduction in total catch in the scallop fishery compared to recent years. Over the long term the projected catch maintains near the average, and is similar to recent years (50-60 million pounds). The measures included in this action are expected to have long-term benefits for participating vessels, and the economic impacts on various sectors of the fishery have been considered. Section 5.4 is a detailed examination of the expected economic impacts of this action. Harvest from the Atlantic sea scallop fishery will continue to be reviewed, established, and analyzed through the biennial framework process. Recreational fishing for sea scallops is rare and does not affect the success of the FMP.

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

The proposed action includes catch limits for certain sectors of the scallop fishery, as well as effort controls for the rest of the fishery that is not under a direct TAC or quota. This action covers 2011 and 2012 only, with default measures for 2013 which will be updated and superseded by a forthcoming action. Measures have been set at the fishing mortality target of $F = 0.38$ in open areas, so overfishing is not expected to occur.

The Council is awaiting approval of an amendment to bring the Scallop FMP in compliance with new annual catch limits required under the reauthorized Magnuson-Stevens Act of 2007 (Amendment 15). The Scallop FMP is required to implement ACLs and accountability measures by 2011, and the Council made final decisions on that action in September 2010. In the meantime, this FMP is still required to have an ABC set by the SSC, and management measures are not allowed to exceed that ABC. The ABC is set at 31,288 mt in 2011 and 33,243 mt in 2012 (69.0 and 73.3 million pounds, respectively), including an approximate 4100 mt (9 million pounds) for non-yield fishing mortality (discards and incidental mortality). Therefore, the overall ABC for the fishery, excluding discards and incidental mortality is 27,276 mt in 2011 and 28,968 mt in 2012 (60.1 and 63.9 million pounds, respectively). Fishery allocations under the proposed action are set at $F = 0.38$ for open areas, and the annual catch associated with that fishing mortality level is projected to be around 50-60 million pounds.

6.2 NEPA

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

6.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

- The need for this action is described in Section 1.2;
- The alternatives that were considered are described in Section 2.0 (alternatives including the proposed action);
- The environmental impacts of the proposed action are described in Section 5.0;
- A determination of significance is in Section 6.2.2; and,
- The agencies and persons consulted on this action are listed in Section 6.2.3 and 6.2.4.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An executive summary can be found on page iii;
- A table of contents can be found on page xv;
- Background and purpose are described in Section 1.0;
- A summary of the document can be found in the executive summary, page iii;
- A brief description of the affected environment is in Section 4.0;
- Cumulative impacts of the proposed action are described in Section 5.7;
- A list of preparers is in Section 6.2.3.

6.2.2 Finding of No Significant Impact

National Oceanic and Atmospheric Administration (NOAA) Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. On July 22, 2005, NOAA published a Policy Directive with guidelines for the preparation of a Finding of No Significant Impact (FONSI). In addition, the Council on Environmental Quality (CEQ) regulations at 40 CFR 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 significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria, the recent Policy Directive from NOAA, 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: No, the proposed action is not reasonably expected to jeopardize the sustainability of the sea scallop resource. This action sets specifications for fishing years 2011 and 2012 by modifying the rotational area management program implemented by Amendment 10. None of the modifications are expected to cause increases in fishing mortality above the overfishing threshold that would jeopardize the sustainability of the scallop resource. The action is designed to be consistent with the mortality targets adopted in Amendment 10 and the overall target has been set at a level less than ABC taking into account sources of biological and management uncertainty, as proposed in Amendment 15.

(2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

Response: No, the proposed action is not reasonably expected to jeopardize the sustainability of any non-target species. A general description of the non-target species is summarized in Section 4.5, and a complete bycatch analysis of the scallop fishery was completed in Amendment 15. Section 5.5 summarizes the overall impacts of this action on non-target species. In general, this action does not increase overall fishing effort above levels assessed in Amendment 15, thus there is no indication that impacts on non-target species will be different.

Due to the distribution and behavior of yellowtail flounder, bycatch in the scallop fishery has been documented and is expected to continue under this action. Therefore, specific measures are in place to close access areas on Georges Bank when 10% of the yellowtail flounder TAC is reached on trips into both Closed Area I and Closed Area II. No additional impacts are expected.

(3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson-Stevens Act and identified in FMPs?

Response: No, the proposed action is not reasonably expected to cause substantial damage to the ocean and coastal habitats and/or EFH. Relative to the baseline habitat protections established under Amendment 10 to the Atlantic Sea Scallop FMP, those impacts are negligible, and relative to the No Action alternative, those impacts are marginally positive. Specifically, this action does not allow access into the Habitat Closed Areas, and it maintains the requirement for scallop vessels to use 4-inch rings, which are believed to reduce impacts on benthic environments. Therefore, measures to further mitigate or minimize adverse effects on EFH are not necessary. An EFH Assessment was included for this action (Section 5.2).

(4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

Response: No, the proposed action is not reasonably expected to have substantial adverse impacts on public health or safety. This action does not modify the primary measures used to manage the fishery and is not expected to change fishing behavior in any substantial way to adversely impact safety. Some of the measures related to reasonable and prudent measures (Section 2.8) are expected to potentially shift effort from the Mid-Atlantic and from the summer and fall to the spring and winter. Fishing is dangerous all times of the year, but some of the more restrictive alternatives would limit when vessels could fish in warmer months. The proposed action restricts the limited access fishery to 1 of the 2 access area trips between June 15 and October 31, so only one trip would need to be taken in the winter and spring. It should be noted that many vessels fish Mid-Atlantic access areas during the winter and spring as it is, so the proposed action is not expected to have large impacts on fishing behavior, and thus safety at sea.

(5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?
Response: No, the proposed action is not reasonably expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species. Section 4.3 describes the endangered or threatened species that are found in the affected area. Section 5.3 summarizes the impacts of the proposed action on endangered and threatened species; overall, none of the proposed measures are expected to have a significant impact on these species. In fact, this action includes specific measures designed to minimize impacts on sea turtles by limiting effort in the Mid-Atlantic during the time of year when turtles are more likely to interact with scallop gear (Sections 2.9.1 and 5.1.7).

(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/or ecosystem function within the affected area. Section 4.2 describes the physical environment of the affected area including the benthic environment and biological parameters of the scallop resource. In general, this action proposes to maintain fishing mortality at levels similar to those established under Frameworks 19 and 21 (2008, 2009 and 2010 fishing years); therefore, no additional impacts on biodiversity and ecosystem function are expected as a result of this action.

(7) Are significant social or economic impacts interrelated with natural or physical environmental effects?
Response: No, this action does not propose any significant social or economic impacts interrelated with significant natural or physical environmental effects. Because the proposed action improves flexibility and performance of the rotational area management program, which has not had significant social or economic impacts interrelated with significant natural or physical environmental effects in the past, none are expected to result from the proposed action.

(8) Are the effects on the quality of the human environment likely to be highly controversial?
Response: No, the effects on the quality of the human environment are not likely to be highly controversial and the proposed specifications are based on the best available science. The proposed action will modify the rotational area management program and maintain landings near the current level, and positive impacts in the long-term are expected from this program; thus positive impacts on the human environment. Section 5.0 assesses the expected impacts of the proposed action on the human environment, and Section 5.7 describes the potential cumulative effects of this action on the human environment. Overall, both in the short-term (2011-2012) and the long-term (2011-2022), the sum of landings, revenues, and economic benefits for the proposed action will exceed the economic benefits for the No Action.

(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: No, unique areas, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas are not located within the affected area; therefore, there are no impacts on these components of the environment from the proposed action.

(10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: No, the effects on the human environment are not likely to be highly uncertain or involve unique or unknown risks. This action primarily proposes modifications to the existing rotational area management program. The risks and impacts of area rotation on the human environment have been discussed and analyzed in previous actions. Scallop vessels have been awarded access into portions of the Georges Bank closed areas since 1999; therefore, the likely effects on the human environment are well understood.

(11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: No, the proposed action is not related to other actions with individually insignificant but cumulatively significant impacts. Section 5.6 describes fishing and non-fishing past, present and reasonably foreseeable future actions that occurred or are expected to occur in the affected area. Some measures within the proposed action do result in cumulative impacts in some cases, but none of the impacts discussed exceed the threshold that would indicate a significant impact. In summary, the sea scallop resource, EFH, protected species, and the human environment have been impacted by past and present actions in the area and are likely to continue to be impacted by these actions in the future. In general, the proposed action will modify the rotational area management program, which will have positive impacts on the long-term success of the program at preventing overfishing and achieving optimum yield on a continuing basis.

(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: No districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places are located in the affected area; therefore, there are no impacts on these resources from the proposed action.

(13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

Response: No, the proposed action is not reasonably expected to result in the introduction or spread of a nonindigenous species. The only nonindigenous species known to occur in any significant amount within the fishery areas is the colonial sea squirt (*Didemnum sp*.). The tunicate occurs on pebble gravel habitat, and does not occur on moving sand. NMFS and the WHOI HabCam have surveyed the area and studies are underway to monitor *Didemnum*'s growth and effect on scallops and their habitat. At this time, there is no evidence that fishing spreads this species more than it would spread naturally. Furthermore, the proposed action is not expected to spread the species more than regular fishing activity would; however, the spread of invasive tunicates and fishing gear needs to be monitored closely.

(14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about future consideration?
Response: No, the proposed action is not likely to establish a precedent for future action with significant effects, and it does not represent a decision in principle about future consideration. This action modifies an existing rotational area management program that is designed to be reviewed and adjusted every two years. Area rotation was established under Amendment 10, which was an EIS that assessed the long-term impacts of area rotation.

(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: No, the proposed action is not reasonably expected to threaten a violation of Federal, State or local law or requirements imposed for the protection of the environment. This action does not propose any changes that would provide incentive for environmental laws to be broken.

(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: No, the proposed action is not reasonably expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species. Both target and non-target species have been identified and assessed in this document (Section 5.1, 5.5, and 5.6). In general, this action will modify the rotational area management program, which will have positive impacts on both target and non-target species.

FONSI DETERMINATION:
In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Framework 22, and in the SEIS for Amendment 10 and Amendment 15 to the Sea Scallop Fishery Management Plan, it is hereby determined that Framework 22 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.

for Patricia Kurkul

Regional Administrator, Northeast Region, NMFS

6/21/11

Date

6.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:
Mr. Paul Howard, Executive Director
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(978) 465-0492

Framework Adjustment 22 was prepared and evaluated in consultation with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council. Members of the Scallop PDT prepared and reviewed portions of analyses and provided technical advice during the development of the Environmental Assessment. The list of Scallop PDT members includes:

Table 119 – List of Scallop PDT members

Scallop Plan Development Team
Deirdre Boelke, PDT Chair, NEFMC
Charles Adams, NMFS FSO
Emily Bryant, NMFS SF
Peter Christopher, NMFS SF
William DuPaul, VIMS
Demet Haksever, NEFMC
Dvora Hart, NEFSC
Kevin Kelly, ME DMR
Lyle Kessler, USCG
Erin Kupcha, NMFS Observer Program
Jessica Melgey, NEFMC
Kimberly Murray, NEFSC
Cate O'Keefe, SMAST
Julia Olsen, NEFSC
David Rudders, VIMS
Sarah Thompson, NMFS NEPA
Carrie Upite, NMFS PR

In addition, other individuals contributed data and technical analyses for the document; Michelle Bachman (NEFMC staff – impacts on essential fish habitat); and Woneta Cloutier (NEFMC staff – administrative assistant for Scallop FMP).

6.2.4 Agencies Consulted

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

New England Fishery Management Council
Mid-Atlantic Fishery Management Council
National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

6.2.5 Opportunity for Public Comment

The proposed action was developed during the period May 2010 through November 2010 and was discussed at the meetings listed in Table 120, below. Opportunities for public comment were provided at each of these meetings.

Table 120 – Summary of meetings with opportunity for public comment for Framework 22

Meeting	Location	Date
Scallop Oversight Committee Meeting	Hilton Hotel, Providence, RI	May 19, 2010
Scallop PDT	Parker River, Newburyport, MA	June 8, 2010
Council Meeting	Eastland Park Hotel, Portland, ME	June 24, 2010
Scallop Advisory Panel Meeting	Radisson Hotel, Warwick, RI	July 27, 2010
Scallop Committee Meeting	Sheraton Four Points, Revere, MA	August 11, 2010
Scallop PDT	Holiday Inn, Mansfield, MA	August 18, 2010
Scallop Committee Meeting	Radisson Hotel, Warwick, RI	September 7, 2010
Scallop Advisory Panel Meeting	Courtyard by Marriot, Providence, RI	September 22, 2010
Scallop Committee Meeting	Courtyard by Marriot, Providence, RI	September 23, 2010
Scallop PDT Meeting	Inn on the Square, Falmouth, MA	October 20-21, 2010
Scallop Advisory Panel Meeting	Providence, Biltmore, Providence, RI	November 3, 2010
Council Meeting	Ocean Edge Resort, Brewster, MA	November 17, 2010

6.3 MARINE MAMMAL PROTECTION ACT (MMPA)

Section 4.3 of this action contains a description of marine mammals potentially affected by the Scallop Fishery and Section 5.3 provides a summary of the impacts of the proposed action as analyzed in Framework 22. A final determination of consistency with the MMPA will be made by the agency when Framework 22 is implemented.

6.4 ENDANGERED SPECIES ACT (ESA)

Section 4.3 of this action contains a description of marine mammals potentially affected by the Scallop Fishery and Section 5.3 provides a summary of the impacts of the proposed action as analyzed in Framework 22. A final determination of consistency with the ESA will be made by the agency when Framework 22 is implemented.

6.5 ADMINISTRATIVE PROCEDURE ACT (APA)

Sections 551-553 of the Administrative Procedure Act established procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process, and to give public notice and opportunity for comment. The Council did not request relief from notice and comment rule making for this action, and the Council expects that NOAA Fisheries will publish proposed and final rule making for this action.

The Council has held twelve meetings open to the public on Framework 22 (Table 120). The Council initiated this action at the June 2010 Council meeting and approved final measures at the November 2010 meeting. After submission to NMFS, a proposed rule and notice of availability for Framework 22 under the M-S Act will be published to provide opportunity for public comment.

6.6 PAPERWORK REDUCTION ACT (PRA)

The purpose of the Paperwork Reduction Act is to minimize paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with requests for information. Framework 22 does not have any new collection of information requirements subject to the PRA.

6.7 COASTAL ZONE MANAGEMENT ACT (CZMA)

Section 307 of the Coastal Zone Management Act (CZMA) is known as the federal consistency provision. Federal Consistency review requires that “federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable.” The Council previously made determinations that the FMP was consistent with each state’s coastal zone management plan and policies, and each coastal state concurred in these consistency determinations (in Scallop FMP). Since the proposed action does not propose any substantive changes from the FMP, the Council has determined that this action is consistent with the coastal zone management plan and policies of the coastal states in this region. Once the Council has adopted final measures and submitted Framework 22 to NMFS, NMFS will request consistency reviews by CZM state agencies directly.

6.8 DATA QUALITY ACT

Utility of Information Product

The proposed document includes: A description of the management issues, a description of the alternatives considered, and the reasons for selecting the preferred management measures, to the extent that this has been done. These actions propose modifications to the existing FMP. These proposed modifications implement the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as well as all other existing applicable laws.

This proposed framework is being developed as part of a multi-stage process that involves review of the document by affected members of the public. The public has had the opportunity to review and comment on management measures during several meetings.

The Federal Register notice that announces the proposed rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents:

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

Objectivity of Information Product

The category of information product that applies for this product is “Natural Resource Plans.”

In preparing specifications documents, the Council must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas).

This framework is being developed to comply with all applicable National Standards, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures proposed to be implemented under this framework are based upon the best scientific information available. This information includes complete NMFS dealer weighout data through 2009, and includes incomplete dealer weighout data for 2010. Dealer data is used to characterize the economic impacts of the management proposals. The specialists who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the scallop fishery.

The policy choices (i.e., management measures) proposed to be implemented by this document are supported by the available information. The management measures contained in the framework document are designed to meet the conservation goals and objectives of the FMP.

The supporting materials and analyses used to develop the measures in the framework are contained in the document and to some degree in previous amendments and/or FMPs as specified in this document.

The review process for this framework involves the New England Fishery Management Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries headquarters. The document was prepared by staff of the Council and Center with expertise in scallop resource issues, habitat issues, economics, and social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the specifications document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the specifications document and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

6.9 E.O. 13132 (FEDERALISM)

The E.O. on federalism establishes nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. Previous scallop actions have already described how the management plan is in compliance with this order. Furthermore, this action does not contain policies with Federalism implications, thus preparation of an assessment under E.O. 13132 is not warranted.

6.10 E.O. 12898 (ENVIRONMENTAL JUSTICE)

The alternatives in this framework are not expected to cause disproportionately high and adverse human health, environmental or economic effects on minority populations, low-income populations, or Native American peoples.

6.11 EXECUTIVE ORDER 12866 (REGULATORY IMPACT REVIEW)

6.11.1 Introduction

The Regulatory Impact Review (RIR) provides an assessment of the costs and benefits of proposed actions and other alternatives in accordance with the guidelines established by Executive Order 12866. The regulatory philosophy of Executive Order 12866 stresses that in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives and choose those approaches that maximize the net benefits to the society.

The RIR also serves as a basis for determining whether any proposed regulations are a “significant regulatory action” under the criteria provided in Executive Order 12866 and whether the proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act of 2180 (RFA).

This RIR summarizes the effects of the proposed observer program and other alternatives considered in this Framework 22. The Framework 22 document contains all the elements of the RIR/RFA, and the relevant sections are identified by reference to the document.

The purpose of and the need for action are described in Section 1.2. The description of the each selected alternative including the no action alternative is provided in Section 3.0.

6.11.2 Economic Impacts

Section 5.4 evaluated economic impacts of Framework 22 proposed measures and alternatives considered by the Council. Sources of uncertainty are identified in Section 5.4.16. The aggregate economic impacts of the proposed allocation alternatives are analyzed in Section 5.4.2. The numerical results are presented in the tables included in those sections. The individual measures considered by Framework 22 are discussed in Sections 5.4.3 through 5.2.7 and the relevant subsections shown below:

- Economic impacts of no action: Section 5.4.2
- Measures that will be in effect March 1, 2010 until Framework 22 is implemented: Section 5.4.2.1
- Aggregate Economic Impacts including open area DAS and access area allocations: Section 5.4.3
- Acceptable Biological Catch: Section 5.4.3.1
- Specifications for 2013: Section 5.4.3.3
- Allocation of split trips and the lottery system: 5.4.3.4
- Adjustments when yellowtail flounder catches reach 10% TAC limit: 5.4.4.1
- Review of Yellowtail flounder accountability measures: Section 5.4.4.2
- Measures for General category vessels: Section 5.4.5
- Northern Gulf of Maine (NGOM) Hard-TAC: Section 5.4.6.
- TAC set-asides for observers and research: 5.4.7
- Modifications to VMS: Section 5.4.9.
- Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line: Section 5.4.10.
- Extension of unused ETA trips through May 31, 2011: Section 5.4.11.
- Elimination of the Georges Bank closed area rotation schedule: Section 5.4.12.
- Compliance with reasonable and prudent measure in recent biological opinion: Section 5.4.13.
- Uncertainties and risks: Section 5.4.14

6.11.2.1 Summary of Regulatory Impacts

The combined impacts of the proposed regulations on scallop fishery, on consumers and total economic benefits to the nation are analyzed in Section 5.4.3 and subsection from 5.4.3.1 to 5.4.3.7. The economic impacts of the individual measures are discussed in Sections of 5.4.4 through 5.4.13 as indicated above. All the values for economic impacts are presented in terms of 2010 dollars except for the determination of the significant impacts, cumulative present value of the net economic benefits to the nation are also estimated in terms of the 1996 dollars.

No Action and Status Quo (SQ) alternatives:
The economic impacts of the proposed measures are estimated both relative to the "No Action" and relative to the status quo (SQ) levels. Scallop Framework actions prior to Framework 21

compared the economic impacts of the proposed measures to the values for "No Action" alone because the projections for the no action and status quo usually coincided with each other, eliminating the need to have two baselines to estimate cost and benefits of the management actions. The reasons for using two baselines for the cost benefit analyses are summarized below:

- The Guidelines for the Economic Analysis of the Fishery Management Action (NMFS, 2007) [7] state that in estimating the costs and benefits of an action "the proper comparison is '*with the action' to 'without the action'* rather than to *'before and after the action,*' since certain changes may occur even without action and should not be attributed to the regulation." The consistency of the Framework 22 analyses require that the biological and economic impacts of the proposed measures compared to the "No Action" (i.e., without the action) alternative as defined in Section 2.2.1 of the document.
- "No action" as defined in Framework 22 (Section 2.2.1) follows a regulatory approach and refers to continuation of the allocations that are specified in the present regulations so long as they are compatible with the other measures included in those regulations. Because of the restrictions in the rotational area schedules and rules about when an access area will be opened or closed to fishing, the "no action" alternative does not necessarily reflect, however, a "state" or baseline that correspond to the same amount of fishing effort as in the previous management actions. In fact, the fishing effort in the access areas are expected to be significantly lower compared to the levels in 2009-2010 because of these restrictions. As a result, revenues for no action would be significantly lower ($364.5 million in 2011 and $290.1 million in 2012 –undiscounted values) compared to the actual revenues in 2009 ($379.5 million) and in 2010 (estimated to be about $431 million).
- For these reasons, the comparison with the "no action" alternative does not reflect the changes in revenues and economic benefits compared to the recent levels. Even though the NMFS guidelines do not require that the cost and benefits of the management action to be compared to the levels "before the action" is taken, from the perspective of the impacts on the economy and of the participants of the fishery, a baseline that would reflect potential economic impacts relative to the recent level of allocations would provide be insightful. From this point of view, the status quo alternative would be a better baseline because it assumes that the vessels would be allocated exactly the same amounts of open area DAS (38 DAS per full-time vessel) in 2011-2012 and would have the opportunity to take the same number of (4 per full-time vessel) access area trips as they did in 2010. As a result, with this alternative total fleet revenue is projected to be $433.4 million in 2011, which is quite similar to the estimated revenue in 2010 ($431 million). It must be cautioned, however, that the status quo allocations would result in F rates which are above the target F and are included here only for the analytical purposes to show the short and the long-term impacts of the reduction in fishing effort with the proposed action. The revenue projections for SQ alternative for the future years are different than the estimated values for 2010, however. This is because the continuation of the same number of open area DAS and access area trip allocations (SQ alternative) would increase the fishing mortality above the sustainable levels and reduce yield and revenues in the long-term.

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[7] Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions, March 2007, http://www.nmfs.noaa.gov/sfa/domes_fish/EconomicGuidelines.pdf

Further discussion of the no action and the status quo alternatives is provided in Section 5.4.2.

Summary of the aggregate impacts of the proposed measures

- The aggregate economic impacts of the proposed measures and other alternatives, including the open area DAS and access area trip allocations and TAC for the general category fishery, are expected to be positive both in the short-term (2011-2012) and the long-term (2011-2022) compared to the no action alternative. The landings, revenues and economic benefits for the proposed action (Alt 1) will be higher than the landings and economic benefits for the 'No Action" alternative. For the proposed action the cumulative present value of the scallop revenues are expected to be $164.1 million (($153.3 million) higher and of the total economic benefits are expected to be $163.1 million ($153.3 million) higher than No Action levels in 2011-2012 when the present values were estimated at a 3% (7%) discount rate . In the long-term, present value of the cumulative revenues for the proposed action will exceed no action levels by $132.5 million (122.8 million) and the present value of the cumulative economic benefits for the proposed action would exceed the total economic benefits for no action by $136.5 ($126.1) million using a 3% (7%) discount rate (Table 86 and Table 87 in Section 5.4.3.2). In terms of 1996 prices, the net benefits will increase by $174.0 (at 7% discount rate) million to $188.4 million (at 3% discount rate) from the no action levels for the long-term period 2011-2022. Thus the proposed action would have positive economic impacts compared to no action and *average* annual impacts on the economy will not exceed $100 million either in the short- or the long-term. The second year (2012) is the only exception; since the proposed action revenues could exceed values for no action by about $130 million ($428.4 million minus $290.2 million in Table 84). However, this is more of a theoretical than a real impact since as explained above, with no action, the landings from the access areas would be quite low due to the regulatory restrictions, resulting in much lower landings (48.1 million in 2011 and 39.2 million lb.) than the 2010 levels (55 million lb.)
- As discussed above, comparison with the "no action" alternative does not reflect the changes compared to the recent levels of scallop revenues and economic benefits because no action values are much lower than the values either for 2009 or 2010 fishing years. The status quo alternative is a better baseline to assess the economic impacts of the proposed action relative to recent levels in landings and revenues. Comparison of the revenues for the proposed action with the status quo (SQ) levels indicate that present value (PV) of the cumulative revenues for the proposed action would be about $50.4 million ($47.9 million) lower and the PV of the total economic benefits would be about $47.7 million ($45.4 million) lower in 2011-2012 than the SQ values using a 3% discount rate (7% discount rate). Over the long-term from 2011 to 2022, however, the proposed action will have positive impacts on the scallop fleet revenues and total economic benefits compared to the SQ levels. The present value of the cumulative revenues for the proposed action would exceed the SQ revenues by 33.5 million ($19.8 million) and total economic benefits for the proposed action (Alt.1) would exceed the SQ benefits by $36.7 (22.8 million) million using a 3% discount rate (7% discount rate, Table 86 and Table 87 in Section 5.4.3.2). Thus the proposed action will not have either a short-term or a long-term negative annual impact on the economy by $100 million or more compared to the SQ alternative and/or to the levels in 2010.

- The proposed action (Alt.1) would result in largest fleet revenues, compared to other alternatives, Alt2 and Schl, both in the short- and the long-term. Present value (PV) of revenues for the proposed action would exceed the revenues for Alt.2 by $6.5 million in the short-term (2011-2012), and by $53 million in the long-term (2011-2022). The difference in the PV of revenues for proposed action and Schcl alternative is larger, with revenues exceeding the revenues for Schcl by $33.5 million in the short- and by $98.9 million in the long-term using a discount rate of 3% and slightly less using a discount rate of 7% (Table 86 and Table 87 in Section 5.4.3.2).
- Similarly, proposed action would result in largest total economic benefits compared to Alt2 and Schl both in the short- and the long-term. Economic benefits include the benefits both to the consumers and to the fishing industry and equal the sum of benefits to the consumers and producers. The total economic benefits for Alt.1 would exceed the benefits for Alt.2 by $7 million and the benefits for Schcl by $30.5 million in the short-term.
- Over the long-term from 2011 to 2022, the present value of the cumulative economic benefits for the proposed action (Alt.1) would exceed the benefits for no action by $136.5 million, SQ benefits by $36.7 million, Alt.2 benefits by $53.2 million and the benefits for Schcl by $95 million using a 3% discount rate (Table 86 and Table 87 in Section 5.4.3.2). The value of total economic benefits over the long-term will be slightly lower if a 7% discount rate is used to estimate the present value of the benefits but the benefits for the proposed action would still be exceed the levels for the alternative options as shown in Section 5.4.3.10 (Table 107).
- The economic impacts of the proposed action and the alternatives on the general category fishery will be similar to the aggregate impacts summarized above and will be positive both in the short-term and the long-term compared to the no action. The economic impacts are expected to be positive as well compared to the recent levels in 2010. Framework 21 estimated that total landings would be around 47 million lb., and the TAC for the LAGC fishery was 5.5% of that amount. Estimated landings for the proposed action is 52.3 million lb. in 2011 and landings are estimated to be 52 million lb. or over during 2012-2022. Thus the LAGC TAC, revenues and economic benefits for the proposed action will be higher than the levels in 2010.
- The proposed action would result in more DAS-used in the access areas, thus, more DAS from all areas compared to no action levels. Thus, the impacts of the proposed action on employment measured by total crew-days (Crew*DAS) would be positive in 2011-2012 relative to no action. The difference from the no action DAS used amounts to a 16% increase for the proposed action (alt1) and Alt2, and 13% increase for the Schcl option (Table 97 in Section 5.4.3.7). As a result, employment as measured by crew-days will change in the same percentage change to the DAS used and would increase as compared to the no action levels in the short-term (2011-2012).
- As compared the SQ alternative, which is more in line with the recent conditions in the scallop fishery, the overall DAS used in 2011-2012 will decline by 8% for the proposed action (Alt1) and for Alt2 and by 10% for Schcl because these alternatives would allocate less open area DAS compared SQ levels. Although it is uncertain to what extent the reduction in crew-days will result in a reduction in the number of crew given that this reduction is mostly limited to 2011-2012 and that DAS-used are expected to increase in the following years, the vessel owners may prefer to employ same crew for less fishing

days. (For additional discussion of potential impacts on employment please see Social Impacts, Section 5.4). For the long-term period from 2011 to 2022, total DAS-used (thus crew-days and employment) for the proposed action will be slightly higher than the SQ levels. Thus, the proposed action is not expected to reduce employment in the long-term both in comparison to no action and SQ and/or recent levels in 2010.

The cumulative impacts of the measures from Framework 22 proposed measures, and the past actions including Amendment 10, Framework 18 and Amendment 11, Amendment 15, Framework 19 and Framework 20 to the scallop FMP, are estimated to be positive over the long-term. Adjustment of the open area DAS allocations, implementation of trip limits and allocations for the access areas and rotation area management had positive impacts on the scallop industry by increasing the revenues, producer and consumer surpluses and net benefits in the past. The Framework 21 measures are estimated to have positive impacts on consumer, producer and total economic benefits in 2010 exceeding the economic benefits estimated in Framework 21 document. Due to higher than expected landings in 2010 (about 55 million actual landings compared to 47 million estimated in Framework 21) coupled with higher prices than projected, scallop fleet revenues in 2010 ($431 million) is estimated to exceed the levels in 2009 ($379.5 million) by $51.5 million. Because the estimated revenues for the proposed action is about $399.3 in 2011, total fleet revenues are estimated to decline by about $31.7 million in 2010 if the actual landings and prices equaled to what was projected. Because the positive impacts in 2010 ($51.5 million in 2010) exceed the slightly negative impacts in 2011 from Framework 22 measures ($31.7 million compared to the level in 2010), the net cumulative impacts of the proposed measures and the past actions would be positive in the 2011. The revenue for the proposed action would be higher in 2012 ($428.4 million) compared to the levels in 2009-2010, however. The impacts on total economic benefits are proportional to the impacts on fleet revenues. The actions proposed by Framework 22 are expected to increase fleet revenues, profits and total economic benefits compared to both no action and the SQ alternative over the long-term, however. As a result, cumulative economic benefits, which measure the sum of benefits from previous and proposed actions, are expected to be positive.

Summary of the impacts the individual measures

- Reauthorization of the MSA requires the SSC to set an acceptable biological catch (ABC), or maximum catch level that can be removed from the resource taking into account all sources of biological uncertainty. This new requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis. Therefore, this measure is expected to have positive impacts on the landings and revenues, producer and consumer surpluses and net economic benefits to the nation.
- Specifications of precautionary measures for 2013 are expected to have potentially positive economic impacts. If the resource conditions turns out to be less favorable in 2013 than suggested by the biological projections, instead of rolling over 36 DAS until the new Framework is implemented, this measure would allocate only 26 DAS to prevent potentially negative impacts on the resource, scallop yield, thus on the economic benefits from the scallop fishery.

- The allocations of split (half) trips to access areas with biomass levels not large enough to support a full trip will increase landings, revenues and total economic benefits from the fishery. The administration of the lottery is expected to have positive economic impacts on the fishermen since it will provide flexibility for the vessels to trade access area trips, thus to use fully the access area trip allocations.
- Proposed action will implement the yellowtail accountability measures adopted under Amendment 15 will apply in 2011 and beyond. This framework does not include any changes to those measures. Section 5.4.2.4 of Amendment 15 analyzed the economic impacts of this alternative. In general, this measure could increase fishing costs and have negative impacts on the scallop revenues and profits if the effort is moved to less productive areas with lower LPUE and to areas with a higher percentage of smaller scallops that are usually sold at a lower price compared to larger scallops. Implementation of the closure in the subsequent year, rather than in-season, will however prevent derby style fishing and minimize the negative impacts on prices and revenues associated with it.
- The economic impacts of the proposed measures for the limited access general category (LAGC) vessels are expected to be positive both in the short- and the long-term compared to the no action alternative since the TAC for the LAGC fishery will be higher than the no action values. The economic impacts will be positive compared to the recent levels in 2010 as well because Framework 21 estimated that total landings would be around 47 million lb., and the TAC for the LAGC fishery was 5.5% of that amount. Estimated landings for the proposed action is 52.3 million lb. in 2011 and landings are estimated to be 52 million lb. or over during 2012-2022. Thus the LAGC TAC, revenues and economic benefits with the proposed action will be higher than the levels in 2010.
- Set-asides for observer coverage and research are now removed directly from the ABC for this fishery, rather than a percentage of what is allocated to the fishery. Amendment 15 included this revision as well as allocating a fixed poundage for RSA to be 1.25 million pounds. The cost benefit analyses take both of these set-asides into account before allocations are made so no additional direct impacts are expected on the net economic benefits. However, this process is expected to have indirect economic benefits on the sea scallop fishery by improving scallop management through better data and information made possible by timely research into current issues in the fishery.
- The elimination of the GB access area rotation schedule and the opening and closing of access areas in the regulations will reduce confusion and administrative burden. Instead, access area schedules will be based solely on survey results and available exploitable biomass. This will improve the management of the scallop resource with positive impacts on the scallop yield and on economic benefits from the scallop fishery.
- The economic impacts of the RPM measures will vary with the Framework 22 allocation alternatives and the window of time in which the measures are applied. The proposed action will limit the maximum number of trips that can be taken in the Mid-Atlantic areas from June 15 to October 31st one trip per vessel. Because the effort is shifted to a relatively less productive season, total fleet trip costs are expected to increase slightly by $26,583, or by less than 0.1%. Since there is no change in the possession limit, the trips that are shifted from this season are expected to be taken outside of the turtle window, without a loss in total revenue. The proposed action is expected to minimize the effort shift from the turtle window compared to the other alternatives considered by the

Council, thus is not expected to have a significant impact on prices, revenues and total economic benefits.

- Many measures that are discussed in Framework 22 are measures that were implemented with earlier actions, such as Framework 21 and Amendment 11. In other words, for Framework 22 these actions constitute no action, and their impacts were analyzed in previous documents. The following provides a summary of the impacts of these actions:
    - The specific measures that are included if this action is not implemented by March 1, 2010 will help to reduce the adverse impacts of exceeding the proposed allocations in Framework 22 in 2011 on the scallop resource over the long-term. Any excesses over the open area DAS-used or trip allocations for the access areas above the ultimate value allocated for 2011 will be reduced the following fishing year (2012). Therefore, these measures will have positive long-term impacts on landings, revenues, producer and consumer benefit and net national economic benefits.
    - Adjustments when yellowtail flounder catches reach 10% TAC limit will help to minimize loss in pounds and revenue due to the closure of access areas due to yellowtail quota before a vessel takes its trip.
    - The proposed action will keep the value of incidental catch at (50,000 lb.) and the NGOM TAC at 70,000 lb. Since there is no change in these values from the previous action, proposed action will have the same economic impacts as the no action. Removal of the incidental catch before making allocations will ensure fishing mortality targets are not exceeded, thus, will continue to have positive impacts on the resource, scallop yield, on the revenues and profits of the scallop vessels.
    - The proposed action does not include any new area closures. However Framework 22 alternatives included a new rotational area in the Great South Channel with large amounts of small scallops to be closed in fishing year 2010. The impacts of this alternative were analyzed as a part of the aggregate economic impacts (Section 5.4.2). This alternative resulted in lower economic benefits both in the short- and the long-term compared to the proposed action.
    - There will be no changes to VMS and to in-shell possession limit for LAGC vessels. The proposed action would not allow extension of unused ETA trips through May 31, 2011. No action for these measures is expected to reduce the risks of overfishing and in case of in-shell possession limit, is expected to provide flexibility to fishermen. Therefore, the proposed action will not change economic benefits compared to the no action and SQ levels in regard to these measures.

6.11.2.2 Enforcement Costs

The enforcement costs and benefits of the proposed options for Framework 22 are within the range of impacts addressed in Section 8.9 of Amendment 10 FSEIS and Section 5.4.22 and Section 5.6.3 of Amendment 11. The qualitative analysis included a discussion of the pros and cons of the proposed alternatives from an enforcement perspective. The proposed measures by Framework 22 are very similar to the existing measures in terms of the enforcement requirements, since they include the continuation of the area specific trip allocations, area closures, open area DAS allocations, measures for reducing bycatch, and the continuation of observer coverage program. The costs of implementing and enforcing the proposed action are not expected to compromise the effectiveness of implementation and enforcement of this action. Furthermore, there are several mechanisms and systems, such as VMS monitoring and data processing, already in place that will aid in monitoring and enforcement of this action. Therefore, the overall enforcement costs are not expected to change significantly from the levels necessary to enforce measures under the no action regulations.

6.11.2.3 Determination of Significant Regulatory Action

Executive order 12866 defines a "significant regulatory action" as one that is likely to result in: a) an annual effect on the economy of $100 million or more, or one which adversely affects in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; b) a serious inconsistency or interference with an action taken or planned by another agency; c) a budgetary impact on entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; d) novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this executive order.

The preceding analysis shows that Framework 22 would not constitute a "significant regulatory action" since it will not raise novel legal and policy issues, other than those that were already addressed and analyzed in Amendment 10 and Amendment 11. The overall cumulative impacts of the proposed action on scallop revenues are expected to be positive for the long-term period 2011-2022 both compared to the no action and status quo levels as summarized above. Total economic benefits for the proposed action would exceed the Status quo benefits by $36.7 (22.8 million) million using a 3% discount rate (7% discount rate) in terms of 2010 prices for the long-term period 2011-2022. In terms of 1996 prices, the net benefits will increase by $31.5 (at 7% discount rate) million to 50.6 million (at 3% discount rate) for the long-term period 2011-2021. Thus the proposed action will not have either a short-term or a long-term negative annual impact on the economy by $100 million or more compared to the status quo alternative and/or compared to the levels in 2010. The proposed alternatives will not adversely affect in a material way the economy, productivity, competition, public health or safety, jobs or state, local, or tribal governments or communities in the long run. The proposed action also does not interfere with an action planned by another agency, since no other agency regulates the level of scallop harvest. It does not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients.

6.12 INITIAL REGULATORY FLEXIBILITY ANALYSIS

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. Based on this information, the Regulatory Flexibility Analysis determines whether the proposed action would have a "significant economic impact on a substantial number of small entities."

6.12.1 Problem Statement and Objectives

The purpose of the action and need for management is described in Section 1.2 and goal and objectives in Section 2.0 of the Framework 22 document.

6.12.2 Management Alternatives and Rationale

The proposed action is described in several sections in Section 3.0 and no action alternative is described in Section 3.1 of the framework document.

6.12.3 Determination of Significant Economic Impact on a Substantial Number of Small Entities

6.12.3.1 Description of the small business entities

The proposed regulations of Framework 22 would affect vessels with limited access scallop and general category permits. Section 4.4 (Fishery-related businesses and communities) of Amendment 11 document and Section 4.4 of Framework 22 (Economic and Social Trends) provide extensive information on the number, the port, the state, and the size of vessels and small businesses that will be affected by the proposed regulations. The current information on the number of scallop permits for the years 1999 to 2010 are provided in Table 121 and the unique number of permits by right-id is provided in Table 122. According to the recent permit data, there were 313 vessels that obtained full-time limited access permits in 2010, including 250 dredge, 52 small-dredge and 11 scallop trawl permits. In the same year, there were also 34 part-time limited access permits in the sea scallop fishery. The number of active general category vessels has fluctuated in recent years with over 400 vessels with IFQ permits and over 130 vessels with NGOM permits and over 330 vessels with incidental catch permits (up to 40 lb. of scallops per trip) in 2009 as described in Table 124. Therefore, the proposed alternatives of Framework 22 are expected to have impacts on a substantial number of small entities.

The RFA recognizes three kinds of small entities: small businesses, small organizations, and small governmental jurisdictions. It defines a small business in any fish-harvesting or hatchery business as a firm that is independently owned and operated and not dominant in its field of operation, with receipts of up to $4 million annually. The vessels in the Atlantic sea scallop fishery could be considered small business entities because all of them grossed less than $3 million according to the dealer's data for 1994 to 2009 fishing years (Table 125). According to this information, annual total revenue averaged over a million per limited access full-time vessel since 2004. According to the 2009 Dealer data total revenues per vessel were equivalent to 1,031,036 per full-time vessel. Average scallop revenue per general category vessel was $79,915 in 2009 fishing year. Both full-time and part-time limited access vessels had a high dependence on scallops as a source of their income and the majority of the full-time (96%) and the part-time vessels (71%) derived more than 90% of their revenue from the scallop fishery during 2008-2009 (Table 126). Although the current data on the limited access general category fishery is less than perfect, the available information shows again that the majority (more than 70%) of the limited access general category IFQ and the general category NGOM permit holders derived more than 90% of their revenues from the scallop fishery (Table 127). Therefore, scallop fishing is an important source of income for the majority of vessels in the scallop fishery. The increase in scallop prices resulted in higher revenues for all participants and increased the share of scallops in their total income. For the limited access general category vessels the percentage of the total revenue from scallops will likely to decline in 2010 because these vessels were allocated about 10% of the total TAC in 2008-2009 but were allocated 5.5% of the total TAC starting with 2010 according to the provisions of Amendment 11. Section 5.7 (Impact on other Fisheries) and subsection 5.7.3.1 of Framework 22 provide detailed information on the composition of revenue and revenues from other species for the LA vessels. Section 4.4.6 of Framework 22 provides information on the composition of revenues for the limited access general category vessels and discusses some of the data limitations.

Table 121. Scallop Permits by category by application year

Permit category	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Full-time	213	220	224	234	238	242	248	255	256	254	259	252
Full-time small dredge	1	3	13	25	39	48	57	59	63	56	55	54
Full-time net boat	16	17	16	16	16	15	19	14	12	11	12	11
Total full-time	230	240	253	275	293	305	324	328	331	321	326	317
Part-time	12	16	14	14	10	4	3	3	2	2	3	3
Part-time small dredge	3	4	6	8	19	26	30	34	35	32	34	35
Part-time trawl	22	20	18	10	8	3	-	-	-	-	-	-
Total part-time	37	40	38	32	37	33	33	37	37	34	37	38
Occasional	4	4	5	4	3	3	1	2	1	1	-	-
Occasional trawl	20	16	19	15	8	5	5	-	-	-	-	-
Total occasional	24	20	24	19	11	8	6	2	1	1	1	1
Total Limited access	291	300	315	326	342	346	363	367	369	356	362	354

Note: The permit numbers above include duplicate entries because replacement vessels receive new permit numbers and when a vessel is sold, the new owner would get a new permit number.

Table 122. Scallop Permits by unique right-id and category by application year

Permit category	**2008**	**2009**	**2010**
Full-time	250	250	250
Full-time small dredge	52	52	52
Full-time net boat	11	11	11
Total full-time	**313**	**313**	**313**
Part-time	2	2	2
Part-time small dredge	31	32	32
Part-time trawl	0	0	0
Total part-time	**33**	**34**	**34**
Occasional	1	0	0
Total Limited access	347	347	347

Table 123. General category permit before and after Amendment 11 implementation

AP_YEAR	Scallop landings (Million lb.)	Number of active General category vessels	General category permit (up to 2008)	Number of permits qualify under Amendment 11 program			Grand Total
				Limited access general category IFQ permit (A)	Limited access NGOM permit (B)	Incidental catch permit (C)	
2000	0.37	212	2263				2263
2001	1.58	290	2378				2378
2002	1.11	315	2512				2512
2003	1.95	348	2574				2574
2004	3.16	433	2827				2827
2005	7.40	611	2950				2950
2006	6.90	661	2712				2712
2007	4.96	495	2493				2493
2008	4.55	428		342	99	277	718
2009	4.69			404	136	331	871
2010*				316	120	294	730

* Preliminary

Table 124. General category landings and revenue by fish year (Dealer data, nominal values)

Data	2004	2005	2006	2007	2008	2009
Number of vessels	432	619	661	495	367	337
Scallop pounds per vessel	6,553	11,493	10,439	10,026	9,912	12,802
Average scallop revenue per vessel	34,043	88,071	69,181	65,190	67,546	79,915
Total scallop landings	2,831,030	7,113,906	6,900,329	4,963,101	3,637,852	4,314,107
Total scallop revenue	14,706,711	54,515,676	45,728,570	32,268,982	24,789,339	26,931,494
Ex-vessel price ($)	5.6	7.7	6.7	6.5	6.8	6.3

Table 125. Annual scallops landings and revenues per full-time limited access vessel (all FT vessels, in 2008 prices, including TAC set-aside funds used by individual vessels)

FISHYEAR	Average landings by vessel	Average of scallop revenue per vessel	Average Ex-vessel price	Number of FT vessels
1994	71,362	498,666	6.99	210
1995	74,402	528,152	7.10	212
1996	76,672	592,591	7.73	209
1997	61,504	536,356	8.72	200
1998	53,041	425,029	8.01	205
1999	96,662	685,469	7.09	216
2000	139,496	854,240	6.12	229
2001	175,345	778,513	4.44	245
2002	183,792	853,554	4.64	262
2003	188,637	903,557	4.79	279
2004	198,101	1,153,173	5.82	295
2005	145,268	1,243,382	8.56	312
2006	152,778	1,050,665	6.88	314
2007	157,191	1,064,050	6.77	315
2008	145,508	1,005,503	6.94	316
2009	160,475	1,031,036	6.45	316

Table 126. Dependence on scallop revenue by limited access vessels and fishyear

Permit category	Scallop revenue as a % of total	2008		2009	
		Number of vessels	% of total vessels	2009	Number of vessels
Full-time	<75%	7	2%	6	2%
	75%-89%	7	2%	17	5%
	>=90%	315	96%	310	93%
	Total	329	100%	333	100%
Part-time	<75%	7	17%	13	32%
	75%-89%	5	12%	3	7%
	>=90%	29	71%	25	61%
	Total	41	100%	41	100%

Source: Dealer database

Table 127. Dependence on scallop revenue by general limited access vessels and fishyear

Permit category	Scallop revenue as a % of total	2008		2009	
		Number of vessels	% of total vessels	2009	Number of vessels
Limited Access General Category (IFQ)	<10%	33	14%	21	9%
	10%-49%	11	5%	9	4%
	50%-74%	5	2%	5	2%
	75%-89%	16	7%	12	5%
	>=90%	176	73%	194	80%
	Total	241	100%	242	100%
Limited Access General Category (NGOM)	<10%	34	13%	24	9%
	10%-49%	9	3%	4	2%
	50%-74%	6	2%	5	2%
	75%-89%	17	6%	13	5%
	>=90%	196	74%	211	80%
	Total	265	100%	263	100%

Source: Dealer database

6.12.3.2 Determination of significant effects

The Office of Advocacy at the SBA suggests two criteria to consider in determining the significance of regulatory impacts, namely, disproportional and profitability.

The disproportionality criterion compares the effects of the regulatory action on small versus large entities (using the SBA-approved size definition of "small entity"), not the difference between segments of small entities. Framework 22 is not expected to have significant regulatory impacts on the basis of the disproportionality criterion for the following reasons:

1. The proposed measures will affect all the vessels participating in the sea scallop fishery. Although these measures could affect some vessels within the scallop fleet differently than others as discussed below, these differential impacts are not relevant for the disproportionality criterion. The changes in profits, costs, and net revenues due to Framework 22 are not expected to be disproportional for small versus large entities since each vessel will receive the same number of open areas DAS and access area trips allocations according to their categories they belong (i.e., the allocations for all full-vessels are identical and the allocations for the part-time

and occasional vessels are proportional to the full-time allocations, 40% and 1/12th of the full-time allocations, respectively). As a result, the proposed action will have proportionally similar impacts on revenues and profits of each vessel and each multi-vessel owner compared both to No Action and Status Quo.

2. The proposed action is not expected to place a substantial number of small entities at a significant competitive disadvantage relative to large entities.

The profitability criterion will apply if the regulation significantly reduces profit for a substantial number of small entities compared to no action alternative. The proposed action is not expected to have considerable impacts on the small businesses in the short-term and will have positive impacts on the revenues and profits of the majority of small business entities in scallop fishing industry over the long-term compared to the no action alternative. The following section provides a summary of the economic impacts from the proposed action, alternatives and the mitigating factors. The relevant sections of Framework 22, which discusses the rationale and impacts of these measures, are also identified.

6.12.3.3 Summary of the economic impacts of proposed measures and alternatives

6.12.3.3.1 DAS and access area allocation alternatives

Rationale for the proposed allocation measures is provided in Executive Summary for Framework 22 and Section 2.1. Aggregate Economic impacts of these measures including the open area DAS allocations, and trip allocations for the Georges Bank and Mid-Atlantic access areas are analyzed in Section 5.4.3. The following sections provide an analysis of the impacts on the individual vessel and small business entities based on the fleet-wide impacts analyzed in Section 5.4.3.

Summary of the aggregate impacts in the short- and medium term

The economic impacts under E.O. 12866 need not be identified at the vessel or firm level in the RIR, whereas, these levels remains the focus of the RFAA. The aggregate economic impacts of the proposed measures and other alternatives including Georges Bank, Hudson Canyon and Delmarva access area allocations, open area DAS allocations and TAC for the general category fishery are analyzed in Section 5.4.3 both relative to no action and status quo (SQ) from a net national benefit perspective and using a cost-benefit framework. The primary goal of RFAA analysis is to consider, however, the effect of regulations on small businesses and other small entities, recognizing that regulations frequently do not provide for short-term cash reserves to finance operations through several months or years until the positive effects of the regulation start paying off.

The potential economic impacts of the proposed action on the small business entities and on an average scallop vessel are expected to be proportional to the aggregate economic impacts. The proposed regulations will change the allocations of the scallop vessels in the same proportions. In 2011-2012 fishing years, each limited access vessel's open area DAS allocations (32 DAS) will decline in exactly the same percentage compared to the no action (38 DAS) levels, and each limited access vessel will receive the same number of access area trips with the proposed action and the alternatives. Because the thrust of the RFA analysis is short- and medium-term in nature, the RFA analyses provided below are focused on the medium-term (near-term) impacts from 2011 to 2015 fishing years whereas cost-benefit analyses considered impacts also for the long-term from 2011 to 2022 fishing years.

The analysis of the fleet-wide aggregate economic impacts indicated that the proposed action will have positive economic impacts compared to the no action levels both in the short-term (2011-2012) and the long-term (2011-2022). As discussed above, this comparison does not accurately reflect the changes compared to the recent levels of revenues and economic benefits, however. No action would result in fewer actual access area trips compared to 2010, thus would result in significantly lower revenues ($364.5 million) compared to the actual revenues in 2009 ($379.5 million) and in 2010 (estimated to be about $431 million). The estimated fleet revenue for the proposed action (Alt 1) is $399.1 in 2011 and $428.4 million in 2012. Therefore, when compared with no action, the proposed action will result in increase in fleet revenues by $34.6 million (or by 9.6 %,) in 2011 and by $138 million (or by 47.6%, Table 128).

For RFA purposes, it is important however, to examine how the revenues of the small business entities would change relative to the recent levels and/or if exactly the same management policies regarding the allocations were continued. The status quo alternative would be a better baseline from this perspective for two reasons: 1. The SQ alternative assumes that there will be no changes in allocations from their levels in 2010, that is, full-time vessels would receive 38 open area DAS and 4 access area trip allocations both in 2011-2012 (similarly the part-time and occasional vessels would receive the allocations they had in 2010 etc.). 2. Total fleet revenue is estimated to be $433.4 million in 2011 for SQ, a level which is quite similar to the estimated revenue in 2010 ($431 million). The revenue projections for SQ in the future years are different than the estimated levels for 2010 since the same allocations in 2010 are not likely to result in exactly the same level of landings and revenues in the future. This is because the continuation of the same number of open area DAS and access area trip allocations would increase the fishing mortality above the sustainable levels and reduce yield and revenues in the long-term.

Table 128 and Table 129 provide an analysis of impacts on an average full-time vessel in the scallop fishery based on the economic analyses provided in Section 5.4, by converting annual fleet revenues and net revenues to a per full-time vessel equivalent level (excluding the research and observer set-asides, the share for the general category fishery). Overall, it is assumed that the limited access fishery would land roughly 90.3% of the total scallop landings (after the set asides, buffer for LA fishery, and LAGC TAC is removed), which in turn, is divided by 327 full-time equivalent vessels to estimate the landings and revenues per FT limited access vessel.

Table 128 compares the gross revenues per FT vessel for the proposed action and alternatives both with the no action and the SQ alternatives from 2011 to 2015. Table 129 provides a similar comparison based on the net revenues (gross revenues minus trip costs) per FT vessel. The results show that the proposed action will have negative impacts on the revenues and profits of the scallop vessels and the small business entities both in 2011 and 2012 compared to levels in 2010 and the levels for SQ. The estimated fleet revenues will decline by about $34 million from $433.4 for SQ to $399.3 million with the proposed action. As a result, gross revenue per vessel is estimated to decline by 7.9% in 2011 compared to the status quo and by slightly less compared to the actual revenues in 2010 ($431 million), but would exceed the values of actual revenues in

2009 ($379.5 million). In 2012, the estimated revenues for the proposed action ($428. 4 million) will be 4.1% less than the SQ revenues ($446.8 million). The decline in net revenues (proxy for profits) will be slightly lower, 7.7% in 2011 and 4.0% in 2012 compared to SQ levels because the proposed action will lower the fishing costs by allocating a smaller number of open area DAS (32 DAS) than the SQ (38 DAS). Given that the estimated fleet revenue for the proposed action in 2011 is slightly lower than the average fleet revenue for the 2009-2010 fishing years ($405 million) and exceed these values in 2012 is a further indication that the proposed action is not likely to have a considerable adverse impact in the short-run on the revenues and profits of the scallop vessels compared to the status quo and recent levels in 2009-2010.

In the long-term, the economic impacts of the combined measures on the participants of the scallop are expected to be positive. Starting with 2013, the proposed action will increase revenues per vessel by 5.8% in 2013, and by about 3.7% in 2014 and 2015 compared to the SQ alternative, offsetting the losses in 2011-2012. As a result, the cumulative value of the scallop revenue per vessel will be marginally lower (0.1%) in the medium-term compared to the SQ values in 2011-2015. Therefore, in the short- to medium term from 2011 to 2015, the proposed action will not have significant impacts for the scallop vessels compared to SQ levels, but will increase revenues per vessel by about 6.5% compared to the no action levels. The results for the net revenues are shown in Table 129 with comparative impacts.

Table 128. Estimated fleet revenues and revenues per limited access vessel (Total scallop revenue in 2009=$379.5 million, total scallop revenue in 2010=$431 million, average for 2009-2010=$405 million)

Fishing year	Alternative	Fleet scallop revenue (*) ($ million)	Revenue per FT vessel	Change from No Action	% Ch. from SQ levels
2011	No Action	364.5	1,005,876	0.0%	-15.9%
	SQ	433.4	1,196,233	18.9%	0.0%
	Alt1	**399.3**	**1,102,049**	**9.6%**	**-7.9%**
	Alt2	402.1	1,109,683	10.3%	-7.2%
	Schcl	**372.5**	1,028,032	2.2%	-14.1%
2012	No Action	**290.2**	800,853	0.0%	-35.1%
	SQ	**446.8**	1,233,090	54.0%	0.0%
	Alt1	**428.4**	**1,182,403**	**47.6%**	**-4.1%**
	Alt2	418.7	1,155,640	44.3%	-6.3%
	Schcl	420.5	1,160,416	44.9%	-5.9%
2013	No Action	424.9	1,172,576	0.0%	16.7%
	SQ	**364.2**	1,005,152	-14.3%	0.0%
	Alt1	**385.2**	**1,063,048**	**-9.3%**	**5.8%**
	Alt2	374.9	1,034,618	-11.8%	2.9%
	Schcl	422.8	1,166,927	-0.5%	16.1%
2014	No Action	408.0	1,126,062	0.0%	2.6%
	SQ	397.5	1,097,033	-2.6%	0.0%
	Alt1	**412.2**	**1,137,537**	**1.0%**	**3.7%**
	Alt2	407.5	1,124,538	-0.1%	2.5%
	Schcl	**434.7**	1,199,658	6.5%	9.4%
2015	No Action	430.4	1,187,840	0.0%	6.9%
	SQ	402.5	1,110,769	-6.5%	0.0%
	Alt1	**417.3**	**1,151,705**	**-3.0%**	**3.7%**
	Alt2	410.9	1,134,136	-4.5%	2.1%
	Schcl	401.3	1,107,438	-6.8%	-0.3%
2011-2015	No Action	1,918	5,293,207	0.00%	-6.19%
	SQ	2,044	5,642,277	6.59%	0.00%
	Alt1	**2,042**	**5,636,742**	6.49%	-0.10%
	Alt2	2,014	5,558,615	5.01%	-1.48%
	Schcl	2,052	5,662,471	6.98%	0.36%

(*) Includes set asides and general category share

Alternatives:

SQ: Status quo allocations
Alt1: Proposed Action
Alt2: Alternative 2
Schcl: New closure in South Channel

Table 129. Estimated fleet producer surplus and net revenues per limited access vessel

Fishing year	Alternative	Total net revenue (*) (PS, $ million)	Net revenue per FT vessel	Change from No Action	% Ch. from SQ levels
2011	No Action	332.4	917,452	0.0%	-16.5%
	SQ	398.2	1,099,048	19.8%	0.0%
	Alt1	**367.6**	**1,014,659**	**10.6%**	**-7.7%**
	Alt2	369.8	1,020,711	11.3%	-7.1%
	Schcl	**342.8**	946,104	3.1%	-13.9%
2012	No Action	**265.5**	732,848	0.0%	-35.4%
	SQ	**410.8**	1,133,904	54.7%	0.0%
	Alt1	**394.6**	**1,089,108**	**48.6%**	**-4.0%**
	Alt2	385.4	1,063,806	45.2%	-6.2%
	Schcl	386.2	1,066,018	45.5%	-6.0%
2013	No Action	389.2	1,074,075	0.0%	16.6%
	SQ	**333.8**	921,232	-14.2%	0.0%
	Alt1	**353.3**	**975,171**	**-9.2%**	**5.9%**
	Alt2	343.6	948,269	-11.7%	2.9%
	Schcl	388.1	1,071,221	-0.3%	16.3%
2014	No Action	375.1	1,035,209	0.0%	2.7%
	SQ	365.3	1,008,274	-2.6%	0.0%
	Alt1	**379.1**	**1,046,256**	**1.1%**	**3.8%**
	Alt2	374.7	1,034,167	-0.1%	2.6%
	Schcl	**399.6**	1,102,786	6.5%	9.4%
2015	No Action	395.9	1,092,602	0.0%	7.1%
	SQ	369.6	1,020,005	-6.6%	0.0%
	Alt1	**383.4**	**1,058,203**	**-3.1%**	**3.7%**
	Alt2	377.6	1,042,237	-4.6%	2.2%
	Schcl	368.2	1,016,179	-7.0%	-0.4%
2011-2015	No Action	1,758	4,852,186	0.00%	-6.37%
	SQ	1,878	5,182,463	6.81%	0.00%
	Alt1	**1,878**	**5,183,397**	6.83%	0.02%
	Alt2	1,851	5,109,190	5.30%	-1.41%
	Schcl	1,885	5,202,308	7.22%	0.38%

(*) Includes set asides and general category share
SQ: Status quo allocations
Alt1: Proposed Action
Alt2: Alternative 2
Schcl: New closure in South Channel

The economic impacts of the proposed measures for the limited access general category vessels are expected to be positive both in the short- and the long-term compared to the no action alternative since total ACL, thus the share of the LAGC will be higher than the no action values. The economic impacts will be positive compared to the recent levels in 2010 as well because Framework 21 estimated that total landings would be around 47 million lb. in 2010, and the TAC for the LAGC fishery was about 2.3 million lb. (5.0% of 47 million). Estimated landings for the proposed action is 52.3 million lb. in 2011 and landings are estimated to be 52 million lb. or over during 2012-2022. Thus the LAGC TAC will be around 3.1 million lb. in 2011 because to the new method by which ACL is estimated and because there is no buffer applied for the LAGC fishery. Therefore, revenues and economic benefits for the LAGC fishery with the proposed action will be higher than the levels in 2010.

In summary, both in the short- and the medium-term (2011-2015), the proposed action will not have a considerable adverse impact on the net revenues and profits of the scallop vessels. Therefore, the proposed action is not expected to have significant impacts on the viability of the vessels especially in a highly profitable industry like the scallop fishery.

Comparison of the impacts with the alternative options:
The analyses provided above and in Section 5.4 of the document compared the impacts of the alternative options. The proposed action (Alt 1) would result in largest fleet revenues, and net revenues (producer surpluses) both in the short- and the long-term compared to Alt2 and Schl (Table 128and Table 129). Furthermore, Alternative 1 would result in a more stable stream of landings compared to Alternative 2 (Alt2) and Great South Channel closure alternative (Schcl) providing stability in business operations. Status quo allocations would result in higher revenues in the short-term (2011-2012), but lower revenues in the long-run (2012-2022) compared to the proposed action. This is because fishing mortality rates would exceed the target F if the allocations were set at the same levels as in 2010. Therefore, status quo would not be a feasible alternative under the Sea Scallop FMP.

The aggregate impacts of the proposed measures could differ, however, from the economic impacts of the individual measures as discussed in the relevant subsections of Section 5.4 and summarized in the following section.

6.12.3.3.2 Economic impacts of the individual measures

Acceptable Biological Catch

- Economic impacts are analyzed in Section 5.4.3.1
- Rationale is provided in Section 2.1
- **Summary of the impacts of the proposed option and mitigating factors**:

This new requirement is expected to have long-term economic benefits on the fishery by helping to ensure that catch limits and fishing mortality targets are set at or below ABC. This should help prevent overfishing and optimize yield on a continuous basis. Therefore, this measure is expected to have positive impacts on the landings and revenues, producer and consumer surpluses and net economic benefits to the nation.

- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery.

Specifications for 2013

- Economic impacts are analyzed in Section 5.4.3.1
- Rationale is provided in Section 2.1.
- **Summary of the impacts of the proposed option and mitigating factors**: Specifications of precautionary measures for 2013 are expected to have potentially positive economic impacts. If the resource conditions turns out to be less favorable in 2013 than suggested by the biological projections, instead of rolling over 36 DAS until

the new Framework is implemented, this measure would allocate only 26 DAS to prevent potentially negative impacts on the resource, scallop yield, thus on the economic benefits from the scallop fishery.

- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery. The status quo measures would roll-over DAS allocations for 2010 to the 2011 fishing year if the implementation of Framework 22 is delayed increasing the risks for the resource and scallop yield if the scallop abundance turns out to be less than estimated in 2010.

Allocation of split trips and the lottery system

- Rationale is provided in Section 2.1.
- Economic impacts are analyzed in Section **5.4.3.1**
- **Summary of the impacts of the proposed option and mitigating factors**: The allocations of split (half) trips to access areas with biomass levels not large enough to support a full trip will increase landings, revenues and total economic benefits from the fishery. The administration of the lottery is expected to have positive economic impacts on the fishermen since it will provide flexibility for the vessels to trade access area trips, thus to use fully the access area trip allocations.
- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery.

Adjustments when yellowtail flounder catches reach 10% TAC limit

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.4
- **Summary of the impacts of the proposed option and mitigating factors**: This alternative will continue the measures under no action and the allocation of prorated open area DAS will have the same impacts. It will help to minimize loss in pounds and revenue due to the closure of access areas due to yellowtail quota before a vessel takes its trip. As a result, this measure will have positive economic impacts on scallop vessels although the scallop pounds per trip could be lower than the allocated pounds for the Georges Bank access area trips due to the proration.
- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery.

Yellowtail flounder accountability measures

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.4.2
- **Summary of the impacts of the proposed option and mitigating factors**: Proposed action will implement the yellowtail accountability measures adopted under Amendment 15 will apply in 2011 and beyond. This framework does not include any changes to those measures. Section 5.4.2.4 of Amendment 15 analyzed the economic impacts of this alternative. In general, this measure could increase fishing costs and have negative impacts on the scallop revenues and profits if the effort is moved to less productive areas with lower LPUE and to areas with a higher percentage of smaller scallops that are usually sold at a lower price compared to larger scallops. Implementation of the closure

in the subsequent year, rather than in-season, will however prevent derby style fishing and minimize the negative impacts on prices and revenues associated with it.

- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery.

Measures for General category vessels

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.5
- **Summary of the impacts of the proposed option and mitigating factors**: The limited access general category (LAGC) vessels will be allocated 5% of the total ACL and the limited access vessels with the IFQ permits will be allocated 0.5% of the ACL. LAGC allocations are accounted for in the biological projections and included in the cost-benefit analyses provided in Section 5.4.3, so they will not have any additional impacts on the net economic benefits. The economic impacts of the proposed measures for the limited access general category vessels are expected to be positive both in the short- and the long-term compared to the no action alternative since total ACL, thus the share of the LAGC will be higher than the no action values.
- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher economic benefits for the participants of the scallop fishery.

Northern Gulf of Maine (NGOM) Hard-TAC

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.6.
- **Summary of the impacts of the proposed option and mitigating factors**: Proposed action includes a 70,000 pounds hard-TAC for the NGOM, which is equivalent to the "No Action" alternative as specified in the previous Framework action 21. Thus, the proposed action will not have additional economic impacts on the participants of the NGOM fishery.
- **Comparison of the impacts with the alternative options:** The alternative of 31,100 pounds of TAC is expected to reduce the change of excess fishing in federal waters in the NGOM with negative impacts on the on the participants of the NGOM fishery.

TAC set-asides for observers and research

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.7
- **Summary of the impacts of the proposed option and mitigating factors:** Set-asides for observer coverage and research are now removed directly from the ABC for this fishery, rather than a percentage of what is allocated to the fishery. Amendment 15 included this revision as well as allocating a fixed poundage for RSA to be 1.25 million pounds. The cost benefit analyses take both of these set-asides into account before allocations are made so no additional direct impacts are expected on the net economic benefits. In general, however, this process is expected to have indirect economic benefits on the sea scallop fishery by improving scallop management through better data and information made possible by timely research into current issues in the fishery.
- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher benefits for the scallop vessels.

Compliance with reasonable and prudent measure in recent biological opinion

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.12 and in Section 5.4.13.
- **Summary of the impacts of the proposed option and mitigating factors**: The economic impacts of the RPM measures will vary with the Framework 22 allocation alternatives and the window of time in which the measures are applied. The proposed action will limit the maximum number of trips that can be taken in the Mid-Atlantic areas from June 15 to October 31st one trip per vessel. Because the effort is shifted to a relatively less productive season, total fleet trip costs are expected to increase slightly by $26,583, or by less than 0.1%. Since there is no change in the possession limit, the trips that are shifted from this season are expected to be taken outside of the turtle window, without a loss in total revenue.
- **Comparison of the impacts with the alternative options:** There are no other alternatives that would generate higher benefits for the scallop vessels. The only alternative is the "No Action," but no action would not comply with the reasonable and prudent measures to minimize the impacts of any incidental take. The proposed action is expected to minimize the effort shift from the turtle window compared to the other alternatives considered by the Council, thus is not expected to have a significant impact on prices, revenues and total economic benefits.

Modifications to VMS

- Rationale is provided in Section 2.6.2
- Economic impacts are analyzed in Section 5.4.9.
- **Summary of the impacts of the proposed option and mitigating factors:** The proposed action does not include any changes to VMS.
- **Comparison of the impacts with the alternative options:** Alternative option would allow a vessel to turn VMS unit off if it does not intend to land scallops, thus it would reduce the costs of VMS for fishermen. However, allowing vessels to turn off their VMS units while at sea could compromise enforcement and cause more scallop mortality with potentially negative impacts on scallop yield and economic benefits from this fishery.

Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.10.
- **Summary of the impacts of the proposed option and mitigating factors:** The proposed action does not include any changes to in-shell possession limit for LAGC vessels.
- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher benefits for the scallop vessels. The alternative would reduce the possession limit seaward of the VMS demarcation line reducing flexibility to fishermen.

Extension of unused ETA trips through May 31, 2011

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.11.

- **Summary of the impacts of the proposed option and mitigating factors:** The proposed alternative is the no action according to which unused 2010 ETA trips will expire on February 28, 2011.
- **Comparison of the impacts with the alternative options:** The alternative would allow full-time vessels to use any unused FY 2010 ETA trips through May 31, 2011 with positive economic impacts on the scallop vessels compared to the no action.

Elimination of the Georges Bank closed area rotation schedule

- Rationale is provided in Section 2.1
- Economic impacts are analyzed in Section 5.4.12.
- **Summary of the impacts of the proposed option and mitigating factors:**

The elimination of the rotation schedule and the opening and closing of access areas in the regulations will reduce confusion and administrative burden. Instead, access area schedules will be based solely on survey results and available exploitable biomass as assessed by the PDT and SSC, and approved by the Council. This will improve the management of the scallop resource with positive impacts on the scallop yield and on economic benefits from the scallop fishery.

- **Comparison of the impacts with the alternative options:** There are no alternatives that would generate higher benefits for the scallop vessels.

6.12.3.4 Indirectly affected industries

Indirect impacts include the impacts on the sales, income, employment and value-added of industries that supply commercial harvesters, such as the impacts on marine service stations that sell gasoline and oil to scallop vessels. The induced impacts represent the sales, income and employment resulting from expenditures by crew and employees of the indirect sectors. Given that the overall economic impacts of the combined measures proposed by this Amendment on the fleet revenues and profits will be small in the short-term, their indirect and induced impacts are not expected to be significant in the short-term as well. Over the long-term, however, the proposed action is expected to have positive economic impacts on the scallop fishery, and thus will have positive indirect impacts on the indirectly affected industries.

6.12.3.5 Identification on Overlapping Regulations

The proposed regulations do not create overlapping regulations with any state regulations or other federal laws.

7.0 GLOSSARY

Annual fishing mortality target – a rate of removals that when applied over a fishing year is consistent with the objectives of the FMP.

Annual potential increase – the percent increase in total or relative biomass that would occur during a one-year interval if no fishing occurs (i.e. zero fishing mortality). Projection models take into account the size frequency distribution of the population, the expected growth of individuals at each size class, and natural mortality.

Area based management – in contrast to resource wide allocations of TAC or days, vessels would receive authorization to fish in specific areas, consistent with that area's status, productivity, and environmental characteristics. Area based management does not have to rotate closures to be effective.

Area rotation – a management system that selectively closes areas to fishing for short to medium durations to protect small scallops from capture by commercial fishing until the scallops reach a more optimum size. Closed areas would later re-open under special management rules until the resource in that area is similar to other open fishing areas. Area rotation is a special subset of area based management that relies on an area closure strategy to achieve the desired results when there are sufficient differences in the status of the management areas.

B_{max} – a theoretical value when the scallop stock with median recruitment is fished at Fmax. For a stock without a stock-recruitment relationship, like sea scallops, this stock biomass produces MSY when fished at Fmax.

Biological Opinion – an ESA document prepared by either the NMFS or USFWS describing the impacts of a specific Federal action, including an FMP, on endangered or threatened species. The Biological Opinion concludes whether or not the NMFS/USFWS believe that the actions are likely to jeopardize the continued existence of any of the protected species, and provides recommendations for avoiding those adverse impacts.

Closed rotation area – an area that is temporarily closed to postpone mortality on abundant, small scallops.

Consumer surplus - The net benefit consumers gain from consuming fish based on the price they would be willing to pay for them. Consumer surplus will increase when fish prices decline and/or landings go up.

Contagious recruitment – similar amounts of scallop settlement in related areas. When scallop settlement is above average in one area, it tends to be above average in neighboring areas.

Controlled access – a program that allows fishing in a specified area under rules that differ from the normal fishery management rules that apply to normal, open fishing areas. Often controlled access areas have a scallop TAC, a scallop possession limit, and area-specific trip and DAS allocations. Other regulations may apply to achieve certain conservation objectives.

Critical habitat – an area that has been specifically designated under the ESA as an area within the overall geographical region occupied by an endangered or threatened species on which are found the physical or biological features essential to conservation of the species.

Day-at-sea (DAS) – is each 24-hour period that a vessel is on a scallop trip (i.e. not declared out of the day-at-sea program) while seaward of the Colregs line.

Day-at-sea tradeoff – the number of days automatically charged for fishing for scallops in designated areas, regardless of the time actually fished.

Day-at-sea use – the amount of time that a vessel spends seaward of the Colregs line on a scallop trip.

Days-at-sea accumulated – days charged against a vessel's annual day-at-sea allocations, including day-at-sea tradeoffs. Trips in controlled access areas are often charged a pre-established amount of DAS, regardless of the actual duration of the trip.

Endangered species – a species that is in danger of extinction throughout all or a significant portion of its range.

ESA - Endangered Species Act of 1973 as amended.

Exploitable biomass - the total meat weight of scallops that are selected by fishing, accounting for gear and cull size, at the beginning of the fishing year[8].

$\mathbf{F_{max}}$ – a fishing mortality rate that under equilibrium conditions produces maximum yield-per-recruit. This parameter serves as a proxy for Fmsy for stocks that do not exhibit a stock-recruitment relationship, i.e. recruitment levels are driven mostly by environmental conditions.

Fixed costs - These costs include expenses that are generally independent of the level of fishing activity, i.e., DAS-used, such as insurance, license, half of repairs, office expenses, professional fees, dues, utility, interest, dock expenses, bank, rent, store, auto, travel, and employee benefits.

Fixed duration closure – a rotational closure that would be closed for a pre-determined length of time.

Fixed rotational management area boundaries – pre-defined specifications of areas to be used to manage area rotation.

FMP – Fishery Management Plan.

[8] The **average exploitable biomass** is different and is defined as the total meat weight of scallops that are selected by fishing averaged over the fishing year, accounting growth, natural mortality, fishing mortality, and gear and cull size.

Heterogeneity – spatial differences in the scallop resource, life history, or the marine environment.

Incidental Take Statement – a section of a Biological Opinion that allows the take of a specific number of endangered species without threat of prosecution under the ESA. For the Scallop FMP, an incidental take statement has been issued for a limited number of sea turtles to be taken by permitted scallop vessels.

IWC – International Whaling Commission; an international group that sets international quotas and/or establishes moratoria on harvesting of whales.

Localized overfishing – a pattern of fishing that locally exceeds the optimum rate, considering the age structure of the population, recruitment, growth, and natural mortality. This effect may cause mortality that is higher than appropriate on small scallops while under-fishing other areas with large scallops (assuming that the overall amount of effort achieves the mortality target for the entire stock). The combined effect is to reduce the yield from the fishery through the loss of fast-growing small scallops and the loss of biomass from natural mortality on very large scallops.

Long-term closure area – an area closed to scallop fishing for reasons other than achieving area rotation objectives. These areas may be closed to minimize habitat impacts, avoid bycatch, or for other reasons.

LPUE – Similar to catch per unit effort (CPUE), commonly used terminology in fisheries, LPUE in the Scallop FMP refers to the amount of landings per DAS a vessel achieves. This value is dependent on the scallop abundance and catch rate, but also depends on the shucking capacity of the crew and vessel, since most of the scallop catch must be shucked at sea. Since discard mortality for sea scallops is low, discards are not included as a measure of catch in the calculation of LPUE.

Magnuson Act – Magnuson Stevens Act of 1976 as amended.

Meat yield – the weight of a scallop meat in proportion to the total weight or size of a scallop. Scallops of similar size often have different meat yields due to energy going into spawning activity or due to the availability of food.

MMPA - Marine Mammal Protection Act of 1972 as amended.

NAAA - The Northwest Atlantic Analysis Area was a geographic area used in the habitat metric analysis. It's boundary to the North is the Hague line, the NC/SC border to the South, the coastline to the West, and the 500 fathom depth contour to the East.

NEPA – National Environmental Policy Act of 1972 as amended.

Net economic benefits - Total economic benefits measure the benefits both to the consumers and producers and are estimated by summing consumer and producer surpluses. Net economic benefits show, however, the change in total economic benefits net of no action.

NMFS – National Marine Fisheries Service.

Nominal versus real economic values - The nominal value of fishing revenues, prices, costs and economic benefits are simply their current monetary values unadjusted for inflation. Real values are obtained, however, by correcting the current values for the inflation.

Open area – a scallop fishing area that is open to regular scallop fishing rules. The target fishing mortality rate is the resource-wide target.

Operating expenses or variable costs - The operating costs measures the expenses that vary with the level of the fishing activity including food, ice, water, fuel, gear, supplies and half of the annual repairs.

Opportunity cost - The cost of forgoing the next best opportunity. For example, if a fisher's next best income alternative is to work in construction, the wage he would receive from construction work is his opportunity cost.

PDT – Scallop plan Development Team; a committee of experts that contributed to and developed the technical analysis and evaluation of alternatives.

Potential biomass increase - the annual change in the total biomass of scallop meats if no fishing occurs.

Producer surplus -Producer surplus for a particular fishery shows the net benefits to harvesters, including vessel owners and the crew, and is measured by the difference between total revenue and operating costs.

Recently re-opened area – an area that has recently re-opened to scallop fishing following a period of closure that postponed mortality on small scallops. The annual TAC and target fishing mortality rate is defined by time-averaged fishing mortality that allows the area-specific target to deviate from the norm. Special rules (i.e. day-at-sea allocations or trips with possession limits and day-at-sea tradeoffs may apply.

Recruitment – a new year class of scallops measured by the resource survey. Scallop larvae are pelagic and settle to the bottom after 30-45 days after spawning. The resource survey, using a lined dredge, is able to capture scallops between 20 – 40 mm, but more reliably at between 40 and 60 mm. Recruitment in this document refers to a new year class that is observable in the survey, at around two years after the eggs had been fertilized and spawned.

Recruitment overfishing – a high level of fishing mortality that causes spawning stock biomass to decline to levels that significantly depresses recruitment. Because sea scallops are very productive, this mortality rate is substantially higher than F_{max} and the biomass where recruitment is threatened is much lower than the present biomass target.

SAFE Report – A Stock Assessment and Fishery Evaluation Report, required by the Sustainable Fisheries Act. This report describes the present condition of the resource and managed fisheries, and in New England it is prepared by the Council through its Plan Development Teams (PDT) or Monitoring Committees (MC). The Scallop PDT is the MC for the Atlantic Sea Scallop FMP and prepares this report.

SMAST – School for Marine Science and Technology, University of Massachusetts Dartmouth

Scallop productivity – the maximum average amount of biomass that can be taken from a defined area.

Shucking – a manual process of cutting scallop meats from the shell and viscera.

Size selection – in the scallop fishery, size selection occurs at two points: when the fishing gear captures the scallop and when the crew culls the catch before shucking. At the first point, size selection depends on escapement through the dredge rings, twine top, or trawl meshes. At the second point, size selection depends on the size of the catch and marketability. Small scallops are less valuable and more time consuming to shuck a pound of meats. These factors influence whether the crew retains scallops at a smaller or larger size. Size selection by the fishery is the combined effect of mortality from landed scallops, from discard mortality, and from non-catch mortality from the fishing gear. Except under certain rare conditions, most of the mortality has been associated with the landed portion of the catch.

TAC – Total allowable catch is an estimate of the weight of scallops that may be captured by fishing at a target fishing mortality rate. The TAC could apply to specific areas under area based management rules.

Take – a term under the MMPA and ESA that means to harass, harm , pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct with respect to either a marine mammal or endangered species.

Ten-minute square – an approximate rectangle with the dimensions of 10-minutes of longitude and 10-minutes of latitude.

Threatened species – any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

8.0 LITERATURE CITED

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9.0 INDEX

Appendix I:

Appendix B6 to the 50th Northeast Regional Stock Assessment Workshop (50th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 10-17; 844 p.

An assessment of the sea scallop resource in the Northern Gulf of Maine management area.

Appendix B6: An assessment of the sea scallop resource in the Northern Gulf of Maine management area.

Samuel B. Truesdell (University of Maine, Orono), Kevin H. Kelly (Maine Department of Marine Resources, W. Boothbay Harbor, ME), Catherine E. O'Keefe (University of Massachusetts, Dartmouth), and Yong Chen (University of Maine, Orono).

The sea scallop fishery in the Northern Gulf of Maine (NGOM) occurs in federal waters and is managed by the New England Fishery Management Council. The NGOM resource and associated fishery are locally important but amount to a small portion of the total stock and landings. The fishery is managed by TAC independently of the rest of the EEZ sea scallop stock. In particular, management of the NGOM fishery does not involve biological reference points as targets or thresholds. A cooperative survey was carried out by the Maine Department of Marine Resources and the University of Maine in June-July, 2009. The best estimate based on survey results indicates that the biomass of NGOM sea scallops targeted by the fishery (102+ mm or 4+ in shell height) was approximately 103 mt of meats during 2009 with a 95% confidence interval ranging from about 53 to 186 mt. Landings during 2009 amounted to approximately 7 mt. The best estimate of exploitation rate (reported landings in weight / estimated biomass) in the NGOM during 2009 was 0.065, with a 95% confidence interval ranging from 0.035 to 0.12. These estimates are based on density estimates from the survey assuming a range of survey dredge capture efficiency of 40%. NGOM biomass was relatively low during 2009, although small (10-50 mm) "seed" scallops were abundant at two stations on Platts Bank.

Background

Sea scallops (*Placopecten magellanicus)* have been an important resource in the Gulf of Maine coastal region since before European settlement. Initially supplementing the diets of early European settlers and Native Americans (Bourne 1964), a commercial scallop fishery eventually developed in the 1880s (Dow 1956, Bourne 1964, Baird 1967). The Gulf of Maine fishery expanded after World War I (Dow 1971), although fishing effort remained mainly inshore until 1950, when some fishing began in more offshore areas (Dow 1956). Since then, the scallop fishery in the Gulf of Maine has undergone substantial fluctuations with landings ranging from hundreds of thousands to millions of pounds within as little as a three year period (Figure 1).

The recent Amendment 11 to the New England Fishery Management Council Sea Scallop Fishery Management Plan (New England Fishery Management Council 2008) created a separate limited entry program for general category fishing in the Northern Gulf of Maine (NGOM) management area (Figure 2). The program includes a yearly NGOM total allowable catch (TAC; currently 70,000 lbs.) and a daily possession limit of 200 lbs. (New England Fishery Management Council 2008). The effective date of the new management regime was June 1, 2008.

The 2008 NGOM TAC was set based on 2000-2006 landings from federal waters of the Gulf of Maine (New England Fishery Management Council 2008) because information on stock abundance in this area was minimal. In June-July 2009, the Maine Department of Marine Resources (DMR) and the University of Maine (UM) collaborated under the FY 2008 Scallop Research Set-Aside Program to survey this new management area, with the goal of estimating the harvestable scallop biomass and providing information that might be used in updating the

TAC. The survey was carried out aboard the F/V *Foxy Lady II* out of Stonington, ME under contract with the DMR.

Methods

The NGOM was divided into five areas for the purposes of this survey, referred to here (from east to west) as Machias Seal Island (Area 1), Mt. Desert Rock (Area 2), Platts Bank (Area 3), northern Stellwagen Bank (Area 4), and Cape Ann (Area 5; Figure 2). Selection of these areas was based on previous offshore Gulf of Maine scallop surveys (Spencer 1974, Serchuk and Rak 1983, Serchuk 1984, Serchuk and Wigley 1984); recent (2000-2008) vessel trip reports (VTR) indicating the location and magnitude of scallop catches by vessels fishing in federal portions of the Gulf of Maine; recent Maine/New Hampshire inshore trawl survey data (S. Sherman, DMR, pers. comm.); and input from two Maine-based federally-permitted scallop fishermen with experience fishing these areas. VTR data, in particular, indicate that most scallop catches by federally-permitted vessels during 2000-2008 were from Areas 4 and 5.

The survey followed an adaptive two-stage random stratified design (Francis 1984) in areas 4 and 5. These regions were delineated into high, medium, and low density sub-areas based on expected survey catch in order to increase sampling precision. The stratification was based on 2000-2008 VTR data and input from the survey captain and an experienced federally-permitted scallop fisherman. Forty tows were allocated to the first stage among the three sub-areas. After the first survey stage, the within sub-area variance was calculated. Using this variance in combination with the area size, the number of tows allocated to each sub-area in stage 2 was calculated according to the method used by Francis (1984).

Area 2 was stratified into high and low densities. However, because of its large size, the survey in this area was only a single stage. Areas 1 and 3 were not divided into subareas due to low expected scallop densities.

One hundred and ninety-six stations were occupied in total. Tows lasted either five or seven minutes depending on the bottom type and amount of fixed fishing gear in the area. The survey dredge was a 7 ft New Bedford style drag with 2 in rings, 1.75 in head bale, 3.5 in twine top, 10 in pressure plate and rock chains. The dredge had no liner.

At each tow location, all species were identified and counted. Excluding tows on Platts Bank where large numbers of scallop seed were caught, survey catches were low enough that approximately 98% of all scallops were measured for shell height (SH) and about 50% of measured scallops were also sampled for their meat weight (MW) for use in developing a SH to MW relationship.

Results

The most evident features of the NGOM survey length frequency distribution (Figure 3) are the dominance of scallops under 50 mm on Platts Bank and the size class distribution differences between the eastern and western NGOM.

Large numbers of scallop seed were found on Platts Bank, most of which were caught at two stations on the eastern side of the bank (estimated at over 15,000 individuals between the two tows). Some seed scallops were found in other areas but at substantially lower densities.

Another important finding regarding the length frequency distribution is the difference in breadth of size distribution between the eastern and western NGOM. The Cape Ann and Stellwagen Bank survey areas showed a broader size class distribution (approximately 50 – 150 mm) than those in the eastern NGOM (Platts Bank, Mt. Desert Rock and Machias Seal Is.;

Figure 3). This indicates that the western NGOM has had, in general, consistent recruitment and that scallops are able to settle and survive during most years. In contrast, the eastern NGOM tends toward episodic recruitment when conditions are favorable and the populations at these sites are composed primarily of a single size class. See Figure 4 for by-tow length frequency distribution.

Meat weights

The estimated meat weights used to determine the NGOM biomass estimates were based on area-specific shell height-meat weight (SHMW) relationships for the eastern and western NGOM. Meat weight was modeled as a function of shell height assuming multiplicative error structure as:

$$MW_i = \alpha SH_i^{\beta} e^{\varepsilon_i} .$$

SHMT relationships varied considerably over the NGOM survey area (Figure 5). The largest meats were found on northern Stellwagen Bank, followed by Cape Ann and Mt. Desert Rock. The lowest meat weights were found on Platts Bank; however, this was based on a sample size of only 8 scallops. Low meat weights from some eastern Maine areas have been noted in previous reports (Serchuk and Rak 1983, Schick and Feindel 2005).

Biomass estimates

Bootstrapped biomass mean and 95% confidence interval estimates were calculated (1,000 replications) using the "NMFSsurvey" package version 1.0-2 written by Stephen Smith (Canada DFO) in R version 2.8.1. This package allows for various combinations of bootstrap mean and 95% confidence interval calculations. The available bootstrap mean methods are: naïve, rescaling and bootstrap-with-replacement (BWR) and the available confidence interval methods are: percentile (PCT), bias-corrected (BC), and bias-corrected-and-adjusted (BCa).

The bootstrap functions were run under each combination of bootstrap mean and 95% confidence interval calculations at assumed dredge capture efficiency estimates of 30%, 40%, and 50% (Figures 6 and 7). The middle estimate of 40% efficiency was selected as the best estimate because it is close to an estimate by the DMR of 43.6% measured in Cobscook Bay, Maine in 2006 (Kelly 2007). Figures 6-7 show that harvestable biomass was estimated at around 100 mt with absolute maximum confidence intervals from 39.7 (50% efficiency and BWR/PCT bootstrap approach) to 320 mt (30% efficiency and naïve/BCa bootstrap approach). Harvestable biomass was calculated assuming scallops under 4 in SH are too small for commercial boats to regularly target, so only scallops larger than 4 in SH were included in the estimates. The bootstrap means were stable for all efficiencies and all bootstrap methods, though there is some variation in confidence intervals among bootstrap approaches, especially at the upper bounds.

For ease of explanation, and because similar results were found under each combination of methods, the BWR/BC combination is used in the subsequent sections. This combination was found by Smith (1997) to be acceptable for estimating haddock numbers and 95% confidence intervals in a stratified random survey.

Regional biomass estimates

Figures 8 and 9 indicate that Area 1 has the highest mean biomass, though Area 3 has the largest upper confidence level bound (greater than 200,000 kg at 30% dredge efficiency) due to low sample size and high sample variability. Density calculations also show that scallops in Area 1 appear more abundant per unit area than in any of the other strata (although a substratum in area 4 had the highest overall density). It is therefore surprising that federal vessel trip reports indicate low fishing effort in this region. Possible explanations include the high density of fixed gear in the region and poor meat quality. This area is an important lobster fishing ground and there are large numbers of lobster traps present. During the NGOM survey, alternate stations had to be used and tow durations had to be shortened in this region so that fixed gear was not damaged. Due to poor meat quality (Figure 5), more shucking effort is required to obtain the same amount of meat as in the more productive western NGOM.

Area 3 has the second highest bootstrapped mean biomass at 40% dredge efficiency (Figure 8), but because of limited time for sampling (16 tows) and high degree of variability in catch, the 95% confidence interval ranges from close to zero to over 150,000kg. This variability, along with the large year class of seed scallops, makes Platts Bank a high priority for subsequent NGOM surveys.

The Mt. Desert Rock area (Area 2) had few scallops. Historically there has been some fishing in this region and the Maine fishery has its origins in Mt. Desert Island inshore waters (Smith 1891), but little activity has been recorded in Area 2 in recent years.

The two western NGOM areas (4 and 5) exhibit relatively low biomass (Figure 8) but support most of the fishing activity. The limited fixed gear and good meat condition (Figure 5) are probably the two main contributors to the higher rate of fishing. The high sampling rate (60 tows in each of the two regions) increased precision over the other areas.

Exploitation rates

The 2009 estimated exploitation rate for the NGOM at 40% dredge efficiency was 0.065, with a 95% confidence interval ranging from 0.035 to 0.12 (based on the BWR/BC method; Figure 10). Landings are based on dealer and vessel reports and were retrieved from the NMFS Northeast Regional Office website.[4]

The exploitation estimates were somewhat sensitive to the assumed capture efficiency level. The mean exploitation rate for assumed efficiency of 30% is 0.049 and the mean for assumed efficiency of 50% is 0.080. The range in estimated confidence intervals (the lower bound of the 95% confidence interval at 30% efficiency and the upper bound of the 95% confidence interval at 50% efficiency) was from 0.027 to 0.15 (Figure 10).

The exploitation rate may be higher in some regions, particularly in Areas 4 and 5 in the western NGOM. However, these rates were not able to be estimated due to data confidentiality (VTR reports were for less than 3 vessels).

Platts Bank

The Platts Bank survey area (Area 3; Figure 11) deserves special consideration because two sample locations saw numbers of seed scallops in the thousands (see Figure 4 tows SM3C04 and SM3C10). These densities were much larger than elsewhere in state or federal waters of the Gulf of Maine. The DMR/UM survey had relatively few (16) tows in Platts Bank because. Although productive in the past, Platts Bank has seen little fishing in recent years so high densities were not anticipated.

The University of Massachusetts School for Marine Science and Technology (SMAST) also surveyed Platts Bank in 2009 (Figure 12). The SMAST survey used a drop pyramid with two different cameras which photographed the bottom at each sample location (see Stokesbury and Harris 2006 for details). Scallop densities and other individual and population statistics were

[4] http://www.nero.noaa.gov/ro/fso/Reports/ScallopProgram/NGOMReport%2020100223.pdf

estimated from the photos. The DMR/UM survey occurred on July 28th and the SMAST survey on August 12 and 13, 2009. The two surveys complemented each other because the DMR/UM survey was able to cover a large area per station and the SMAST survey was able to sample a large number of stations distributed across the area.

As the survey areas were delineated differently between the two projects, biomass estimates are difficult to compare. Therefore, only densities and length frequency data are used in comparing results. Mean scallop densities from the two surveys were almost identical: SMAST estimated $1.87/m^2$ and DMR/UM estimated $1.81/m^2$ (table 1). The confidence intervals, however, were quite different. The SMAST confidence interval is symmetric and estimated assuming a normal distribution while the DMR/UM mean (assuming 40% dredge efficiency) was bootstrapped as described above. Despite the differences in computation of confidence intervals, the main reason the SMAST confidence interval is smaller is that the sampling design allowed for many more sampling locations. The two surveys generally agreed on the spatial distribution of scallop density (Figures 11 and 12) with highest densities on the eastern side of Platts Bank.

High scallop densities on Platts Bank were the result of a recruitment event. It is not known, however, whether this will result in increased fishing activity in the future. The scallops of harvestable size that were sampled on the DMR/UM survey had very low SHMW relationships but only 8 scallops larger than 4 inches were sampled (see Figure 5). Two reasons potentially explain this poor meat quality. One explanation is that Platts Bank is currently poor habitat for scallops. The other explanation is that the meats sampled were simply from older, poorer-condition scallops and that the new recruitment class will potentially have better meats.

The DMR/UM and SMAST shell height composition data are compared in Figures 13 and 14. Compared to the SH measurements from the SMAST large camera, the DMR/UM distribution is shifted somewhat to the left. However, compared to the SMAST digital still camera, the DMR/UM distribution is shifted only slightly to the left. This may be due to the timing of the surveys. The DMR/UM survey took place in late July 2009 and the SMAST survey in mid-August 2009, so the difference between the DMR/UM and SMAST digital still camera SH frequencies could be attributed to growth over the period between the surveys.

When the densities, length frequencies, and spatial distributions are considered, the two surveys compare well. It appears that the DMR/UM survey achieved a large enough sample size to well-characterize the Platts Bank population. Ideally, however, more tows will be included in the future to increase precision. In addition, the SMAST survey was able to estimate the length frequency distribution observed by the DMR/UM survey with their digital still camera without bringing animals to the surface, assuming the slight shift in the SMAST distribution is due to growth.

Recruitment dynamics are unclear in the NGOM. An interesting note is that little recent recruitment was observed in the southwestern NGOM (Cape Ann and Stellwagen Bank). It is possible that oceanographic conditions contributing to recruitment on Platts Bank also reduced larval input to southwestern NGOM.

Conclusions

The 2009 DMR/UM survey confirmed what recent landings data suggest: scallop biomass is currently low in the NGOM management area. NGOM scallops are not heavily fished as the exploitation rate (catch/biomass) is estimated at approximately 0.07. The survey found significant biomass in the Machias Seal Is. area (close to 50,000 kg), an area that is hardly fished probably due to the high concentration of fixed gear and poor meat quality. This area contributes greatly to the low exploitation rate because of its size and lack of fishing. The western Gulf of Maine (Cape Ann and Stellwagen Bank areas) probably have higher exploitation rates. However, rates for these areas could not be estimated due to confidentiality constraints (VTR reports were for fewer than 3 vessels).

The high densities of scallop seed noted on Platts Bank by both the DMR/UM and SMAST surveys could prove important once those scallops recruit to the fishery. The poor meats encountered on Platts Bank by the DMR/UM survey also leave open the possibility that while densities on Platts Bank may be very high, meat quality may be low. Few samples were taken on Platts Bank, however, so the poor meats are not necessarily representative.

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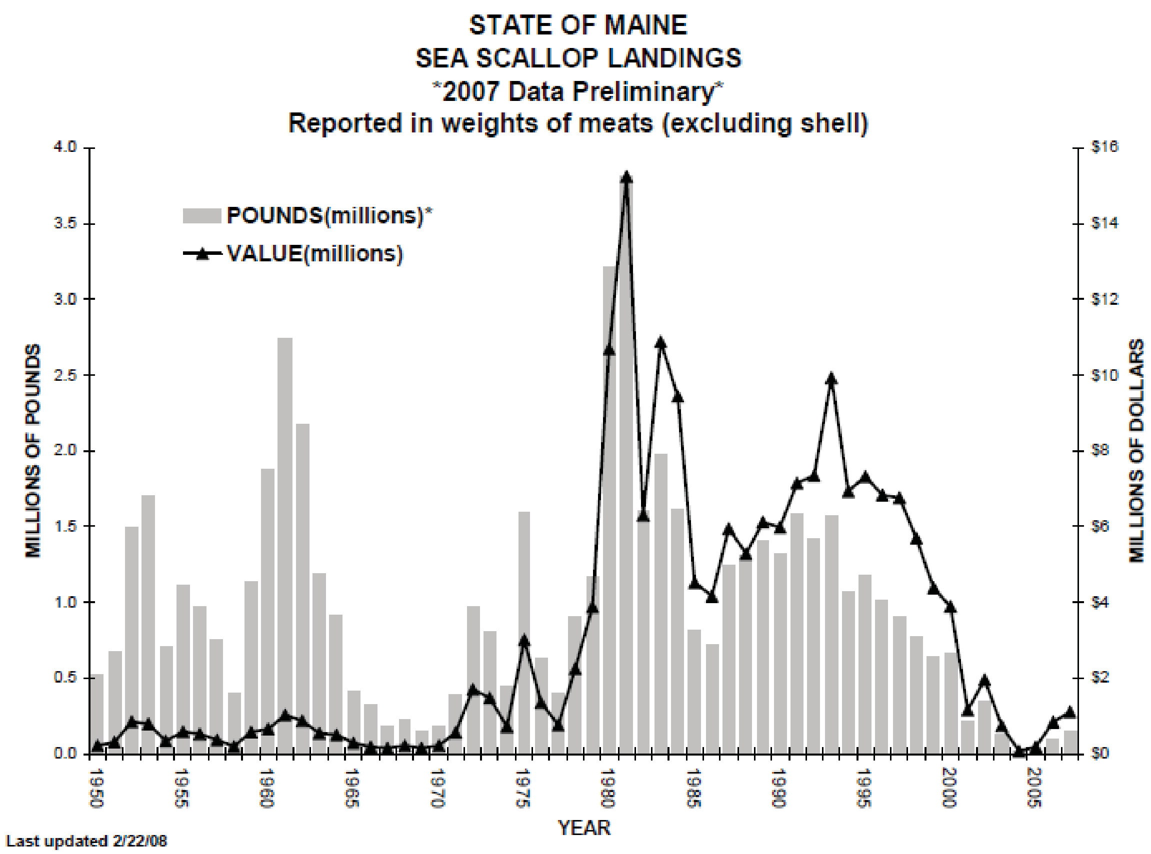
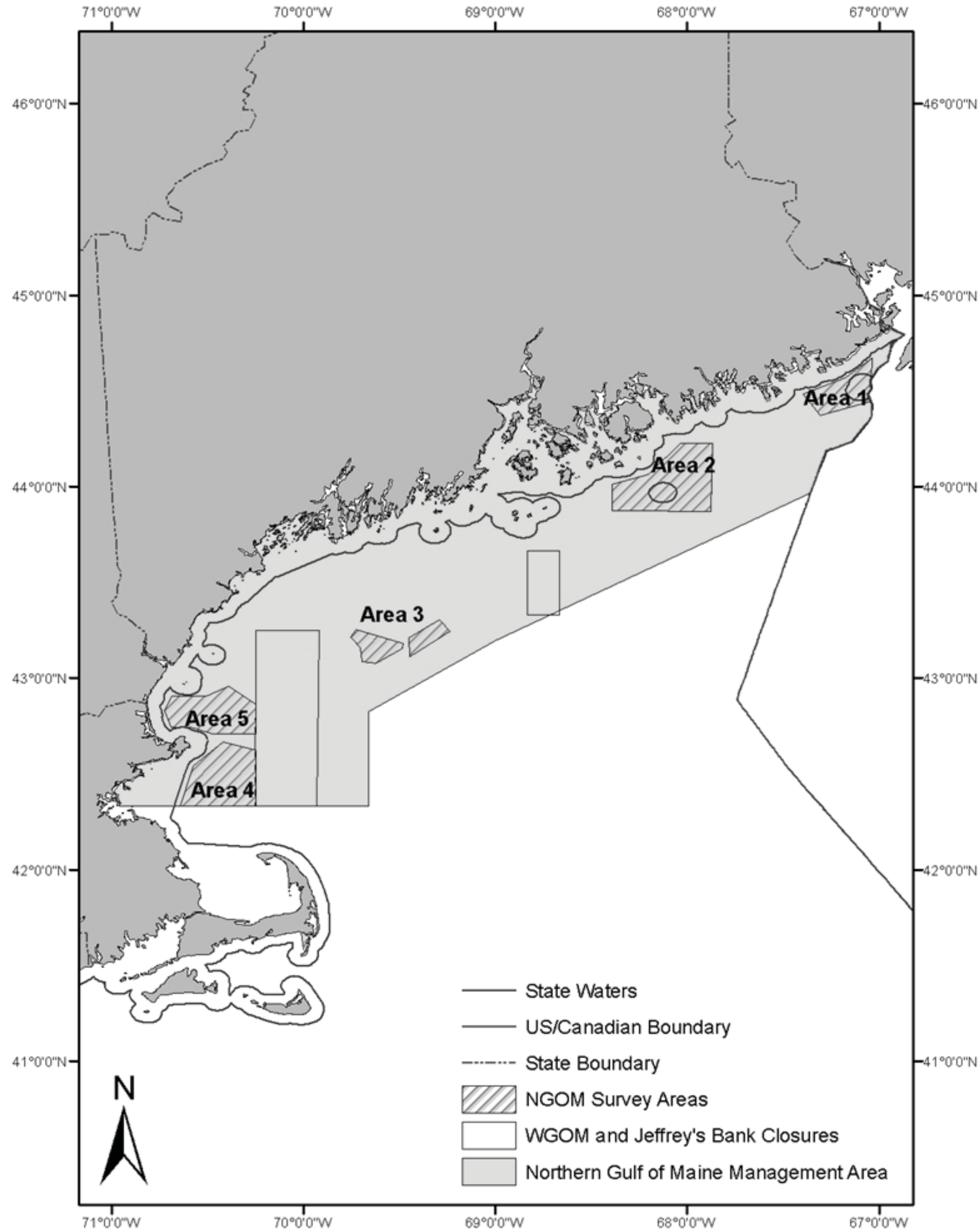
Appendix 6-Table 1. Estimated scallop density (all size classes) on Platts bank for the DMR/UM and SMAST surveys in 2009.

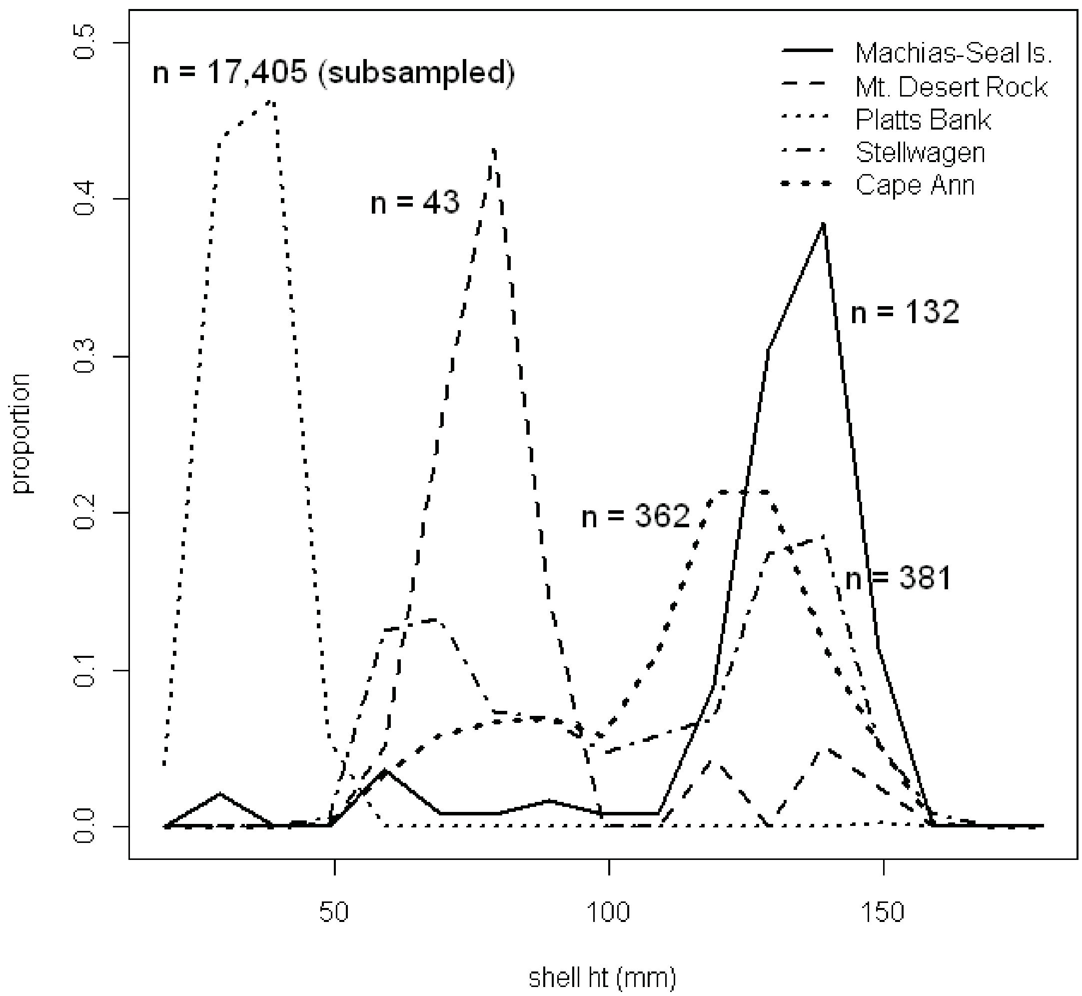
Survey	Mean Density	95% confidence interval
SMAST	1.87	(0.674 , 3.066)
DMR/UM	1.805	(0.014 , 5.071)



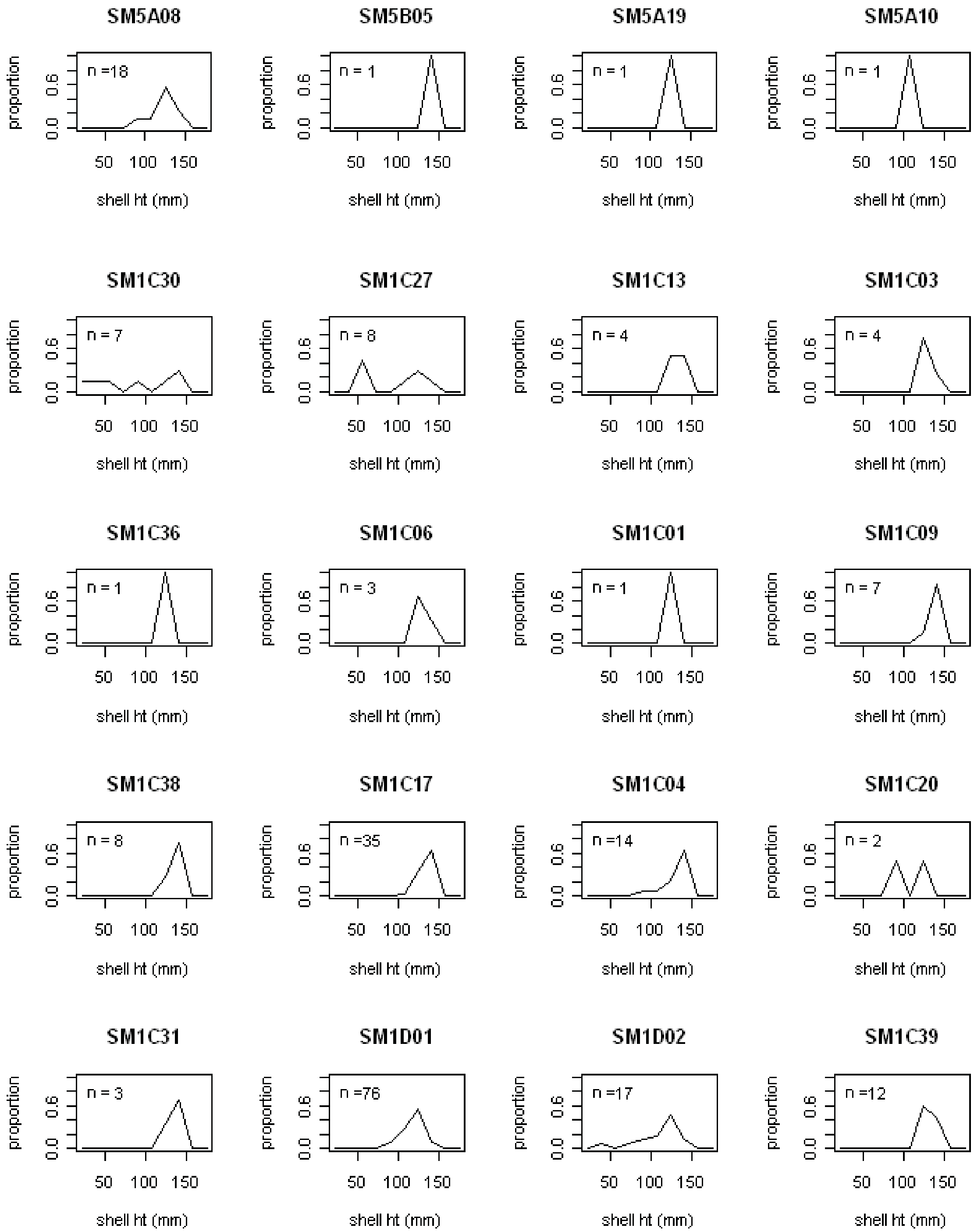
Appendix B6-Figure 1. Maine scallop landings (inshore and offshore) and ex-vessel revenues 1950 through 2007.



Appendix B6-Figure 2. The NGOM management area was divided into 5 regions for the DMR/UM 2009 survey. In numerical order the areas are: Machias Seal Island, Mt. Desert Rock, Platts Bank, Stellwagen Bank and Cape Ann.



Appendix B6-Figure 3. The NGOM length frequency distribution estimated by the DMR/UM survey. The western Gulf of Maine (Stellwagen Bank and Cape Ann) has a much broader size class distribution. Large numbers of seed scallops were found on Platts Bank.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SM5A19
n = 1
SM5A10
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SM1C27
n = 8
SM1C13
n = 4
SM1C03
n = 4
SM1C36
n = 1
SM1C06
n = 3
SM1C01
n = 1
SM1C09
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SM1C20
n = 2
SM1C31
n = 3
SM1D01
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SM1D02
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SM1C39
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proportion
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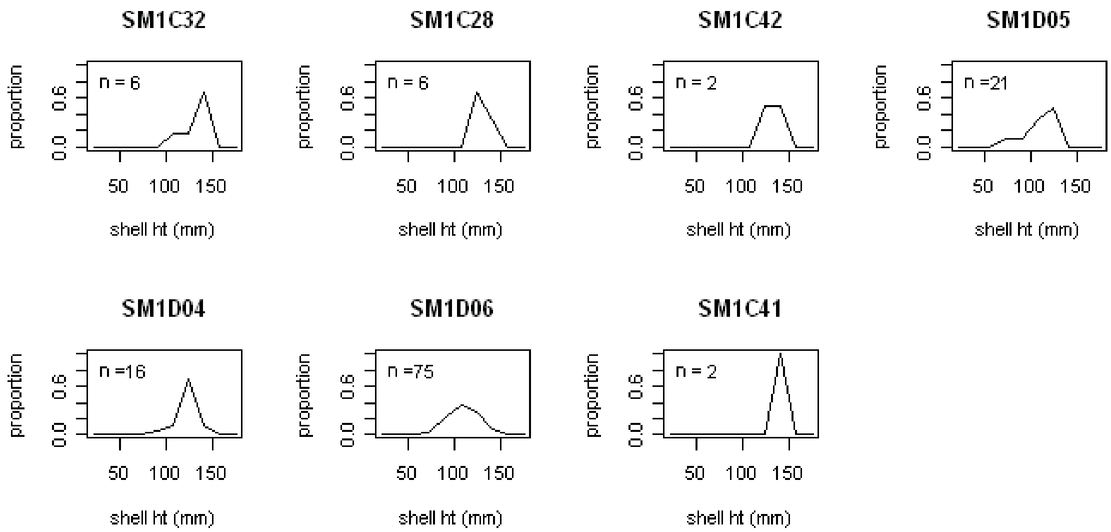
0.6
50
100
150
shell ht (mm)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SM1C28
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SM1D05
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SM1D04
n =16
SM1D06
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SM1C41
n = 2
proportion
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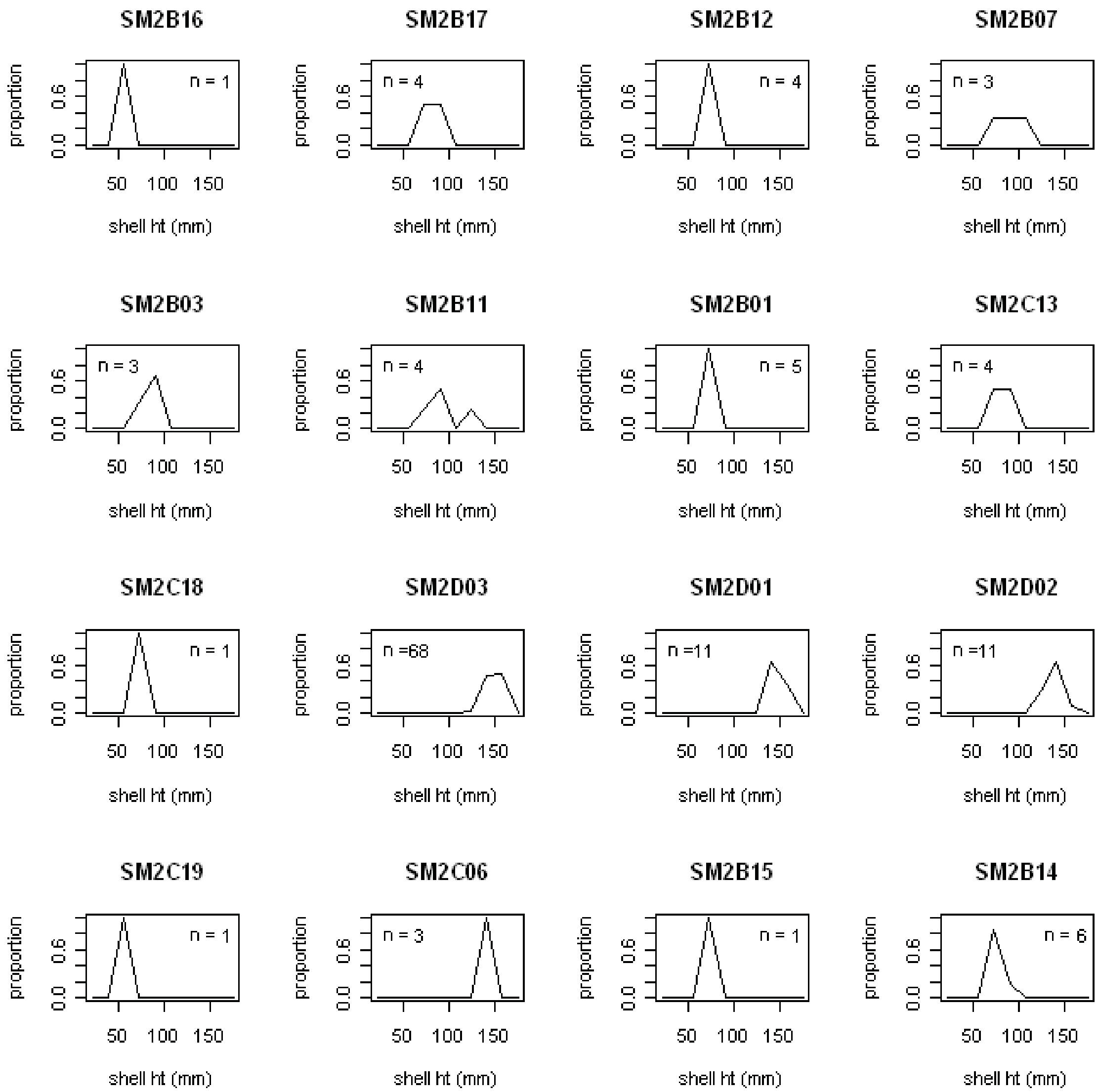
0.6
50
100
150
shell ht (mm)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SM2D02
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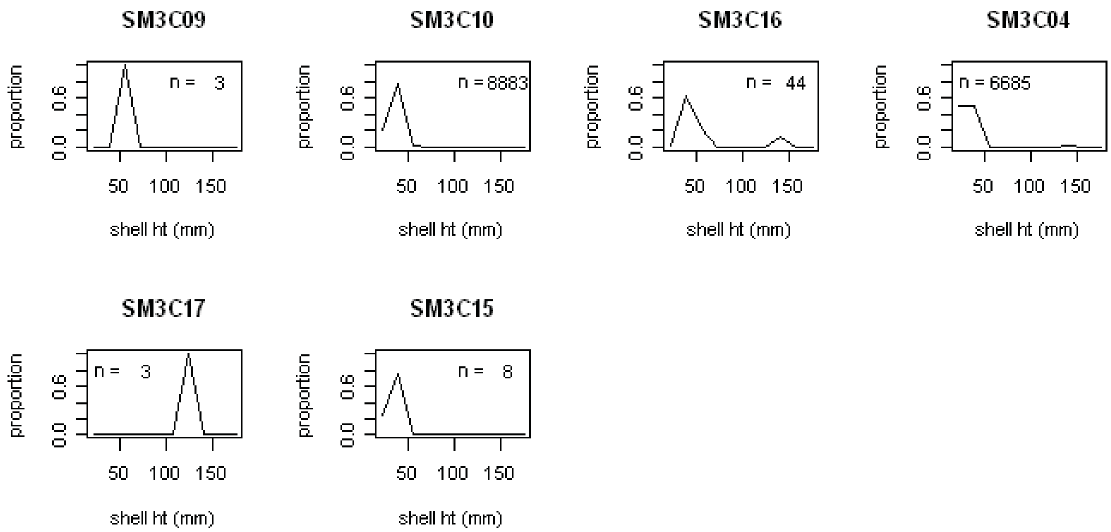
150
shell ht (mm)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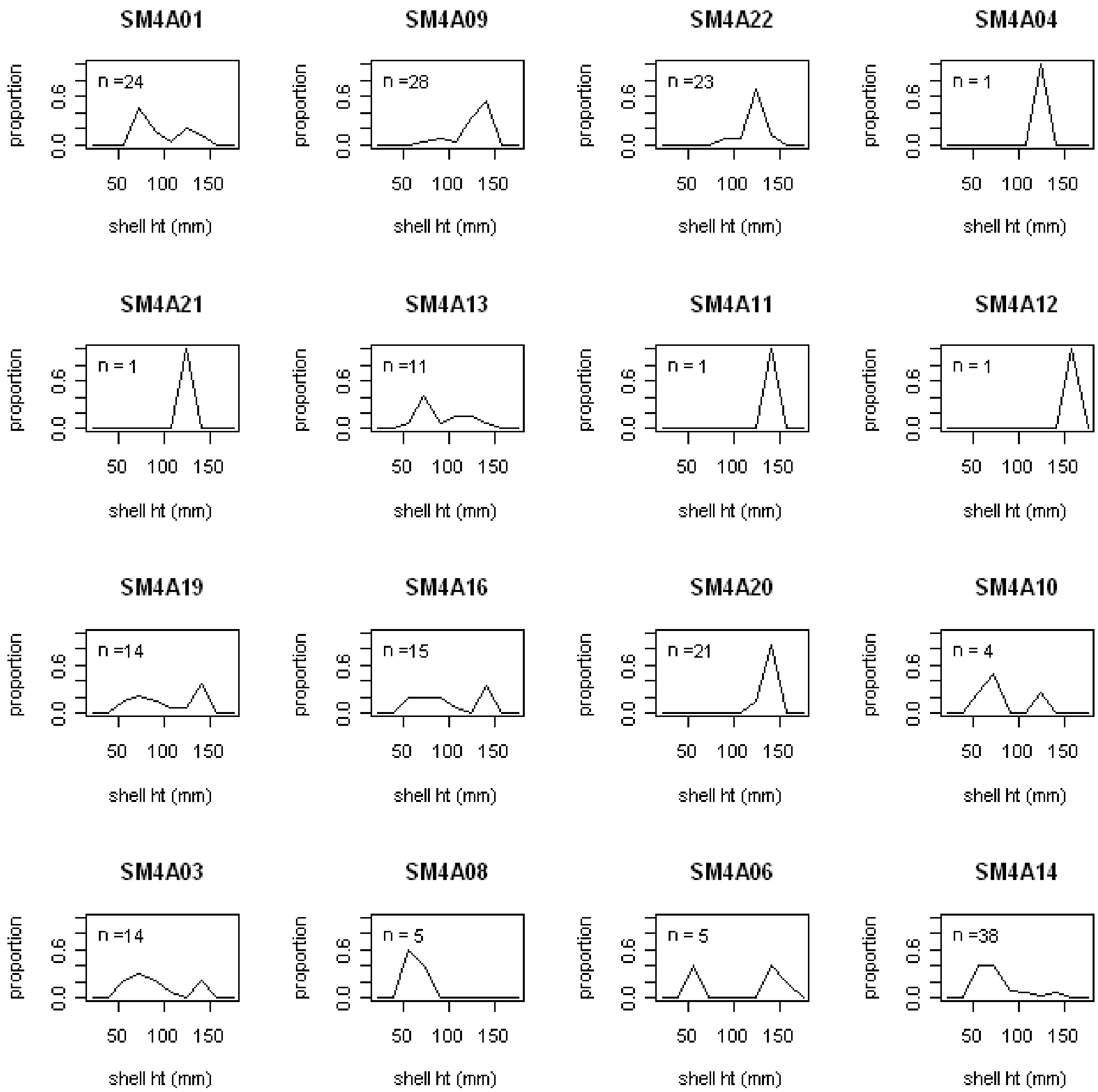
150
shell ht (mm)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SM4A10
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SM4A03
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SM4A08
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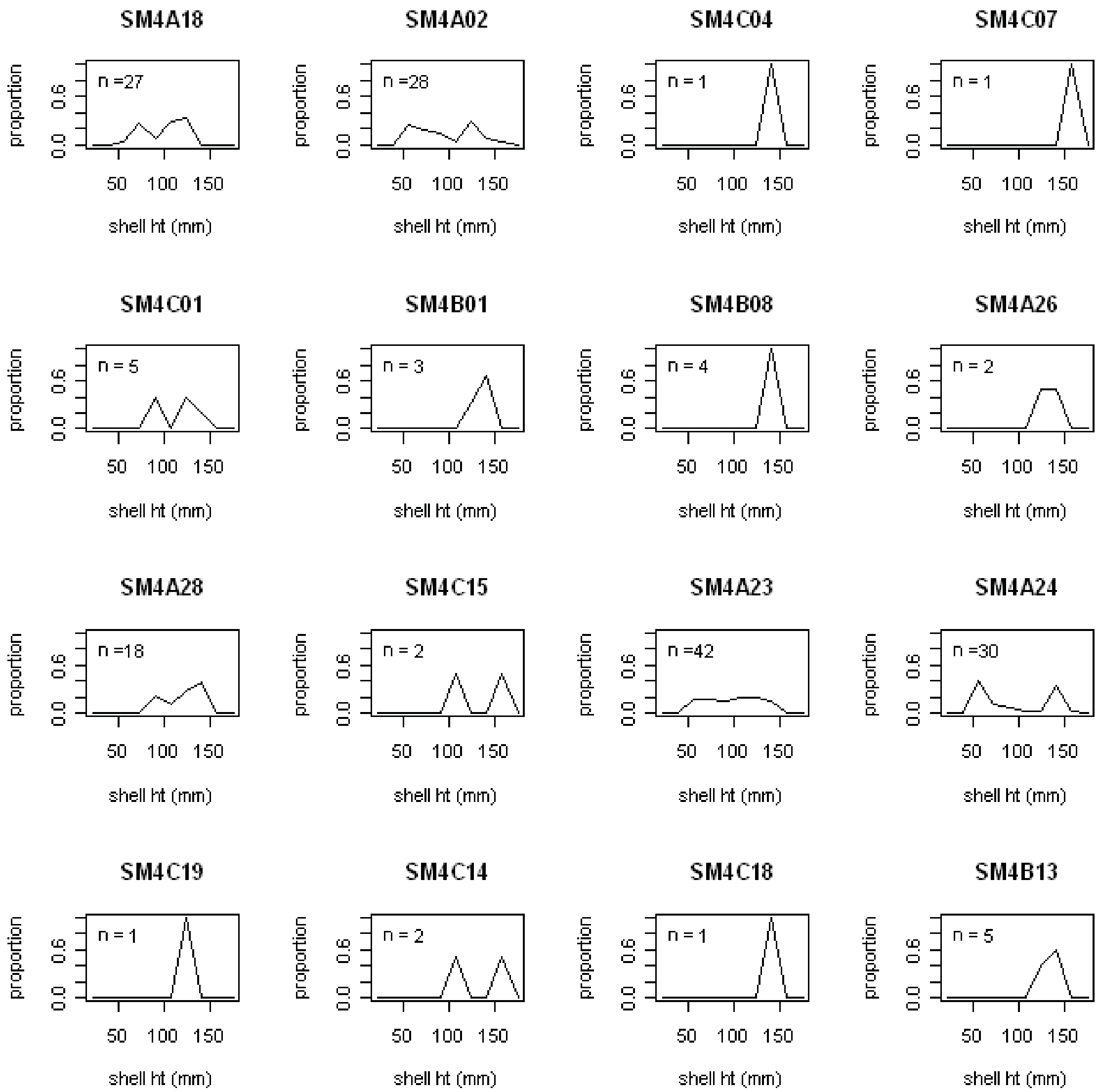
100
150
shell ht (mm)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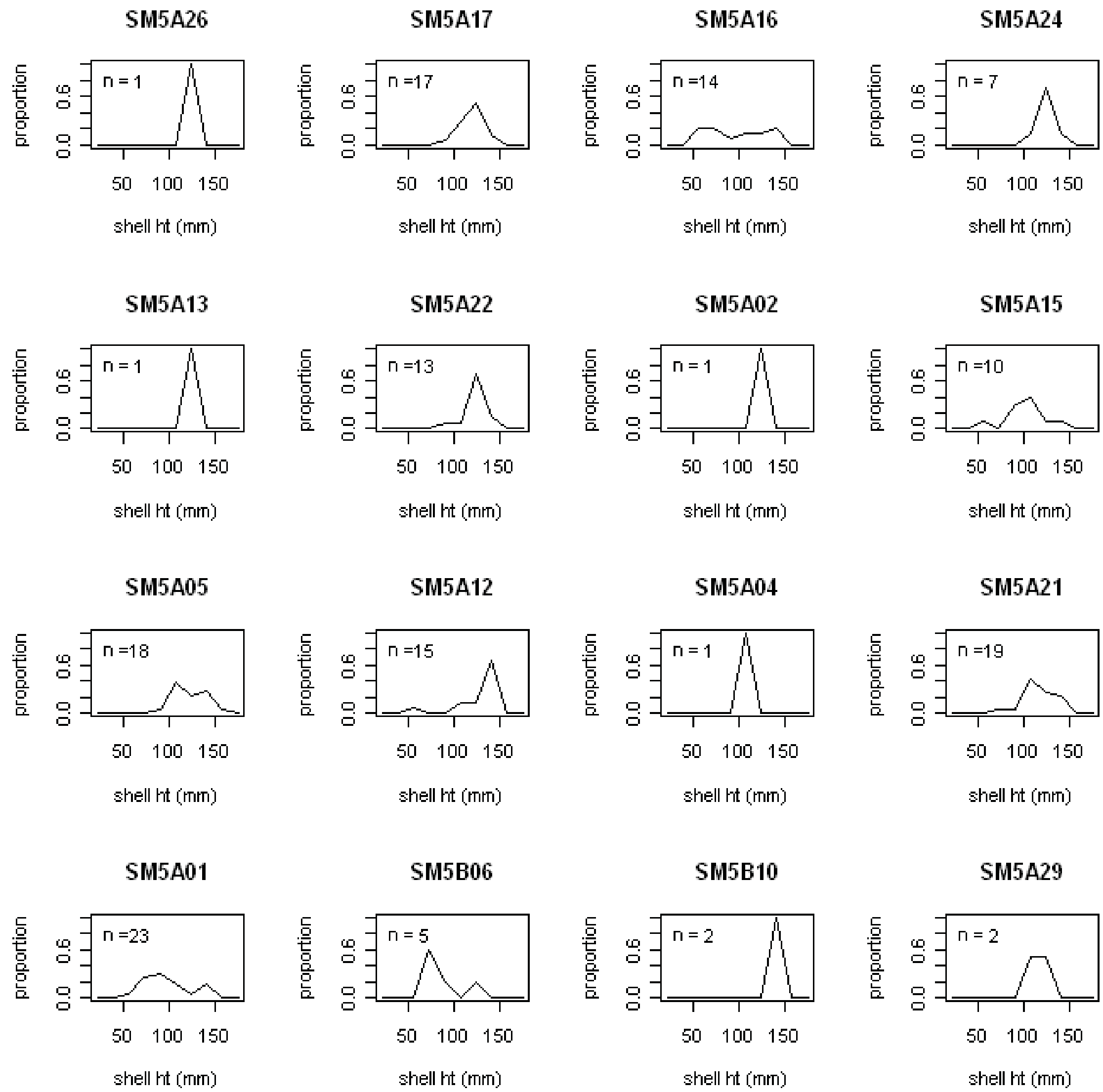
50
100
150
shell ht (mm)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proportion
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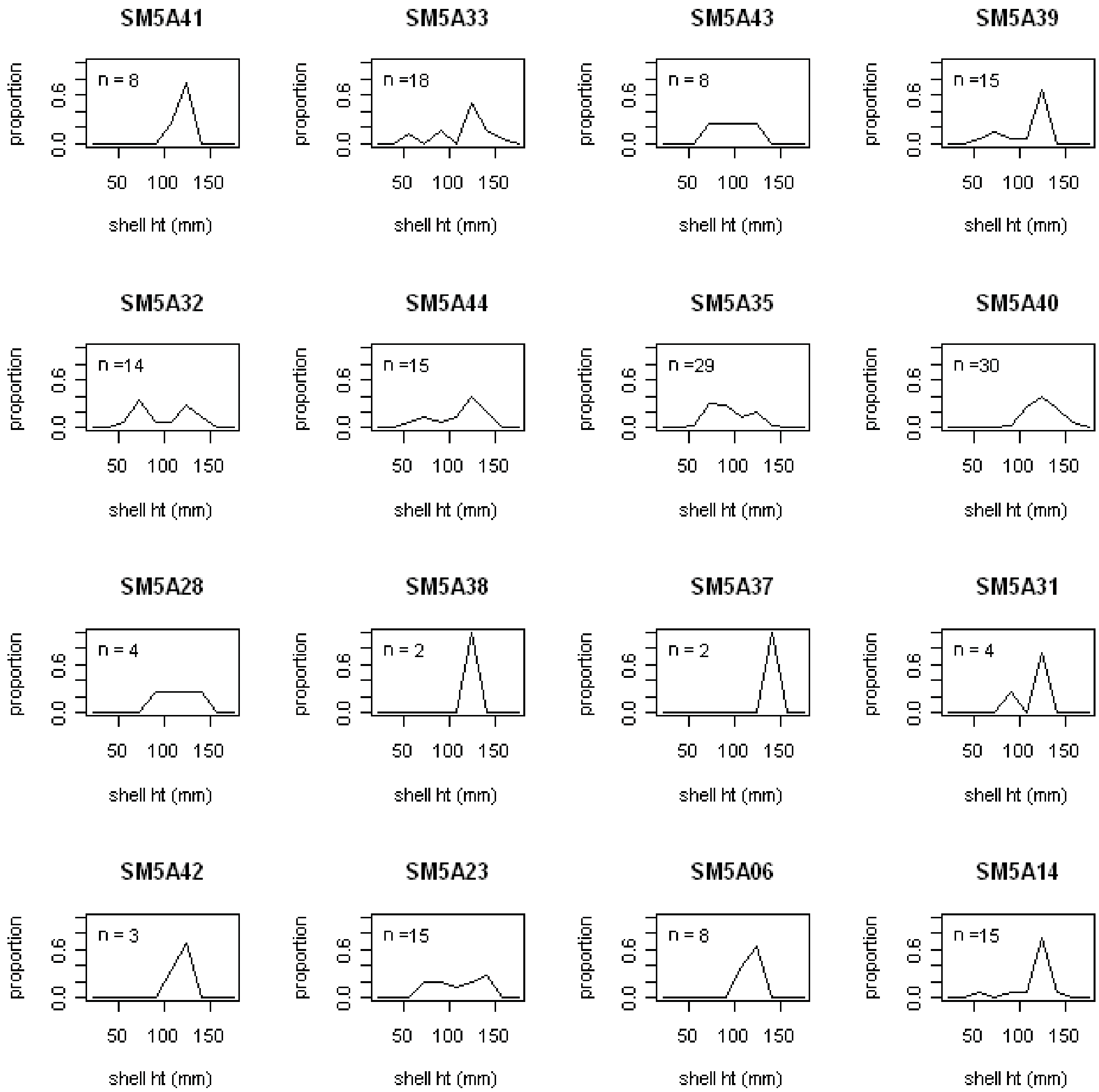
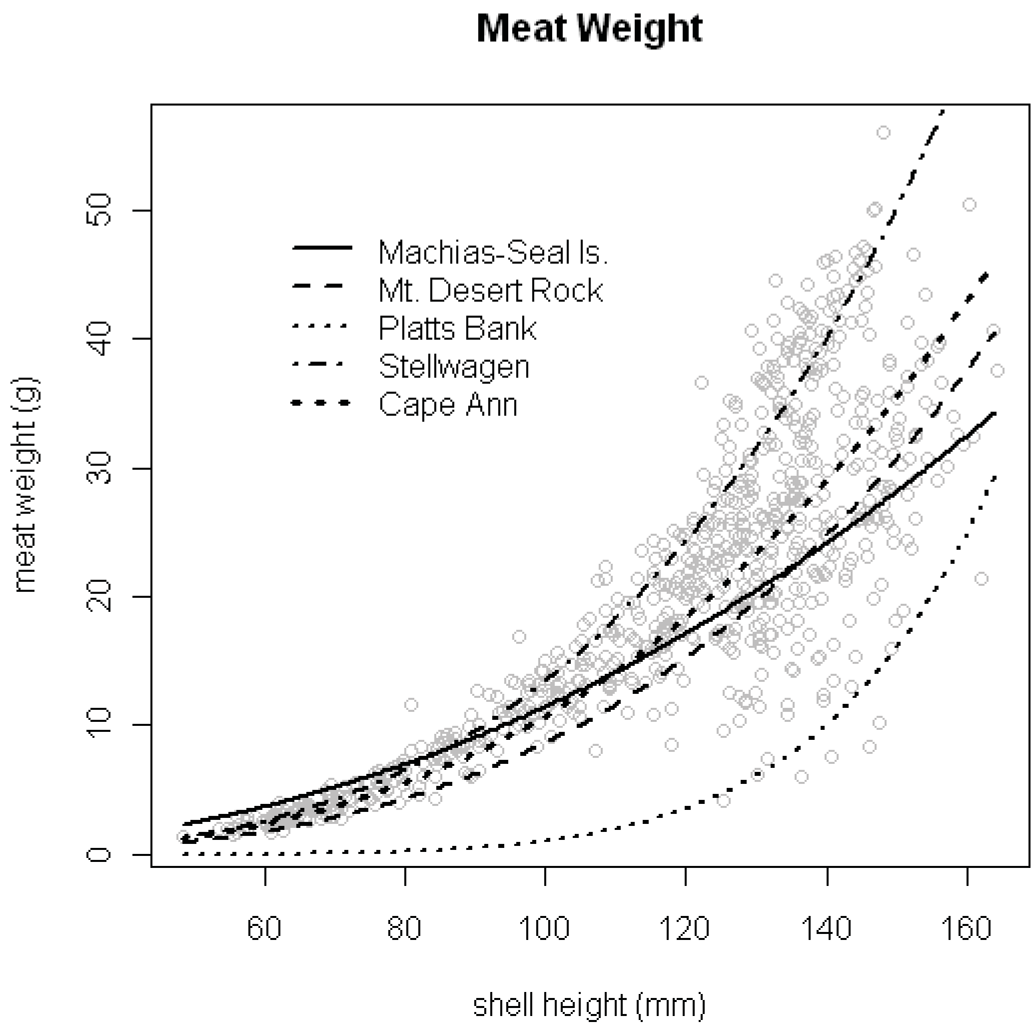
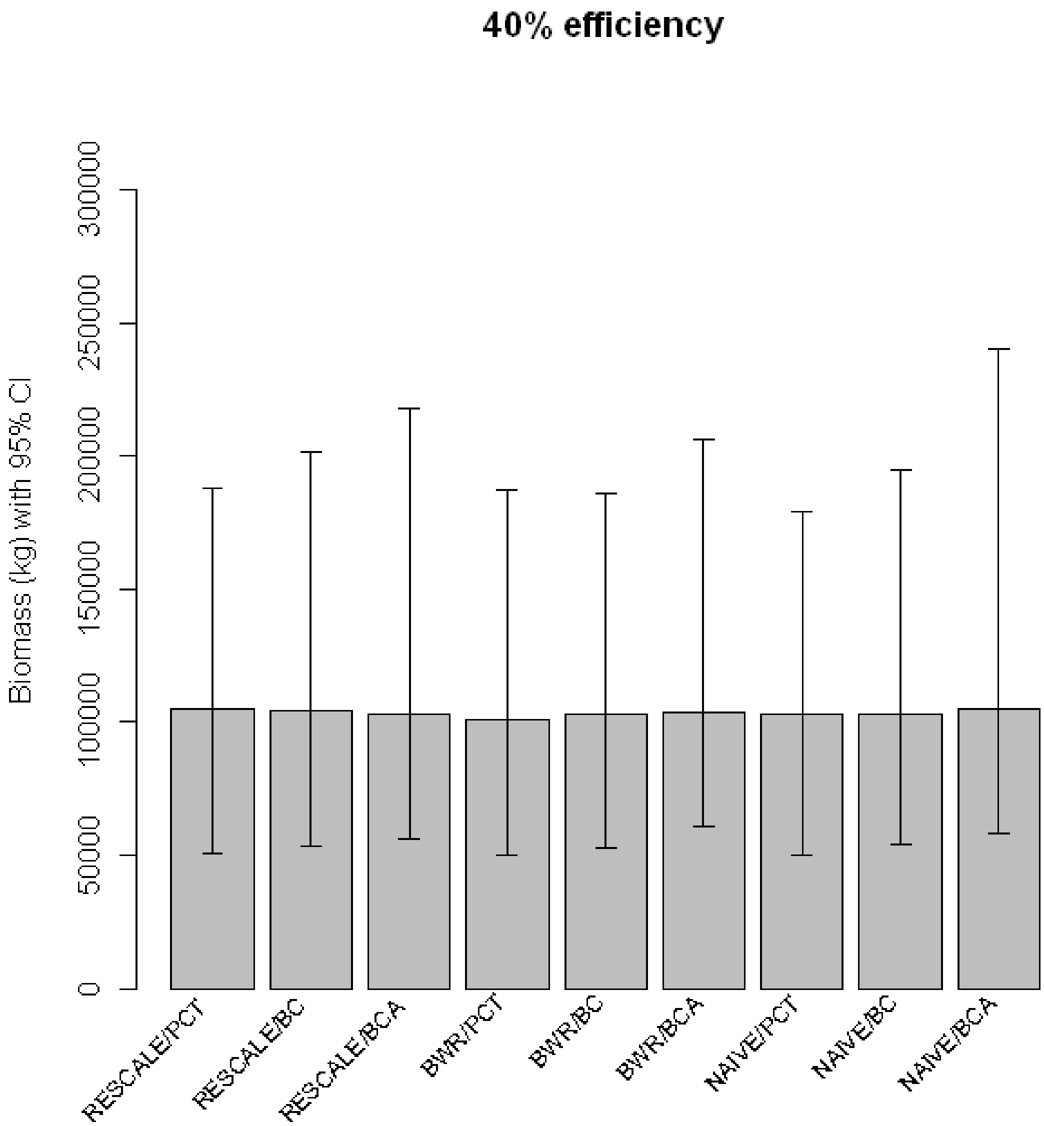
0.6
50
100
150
shell ht (mm)



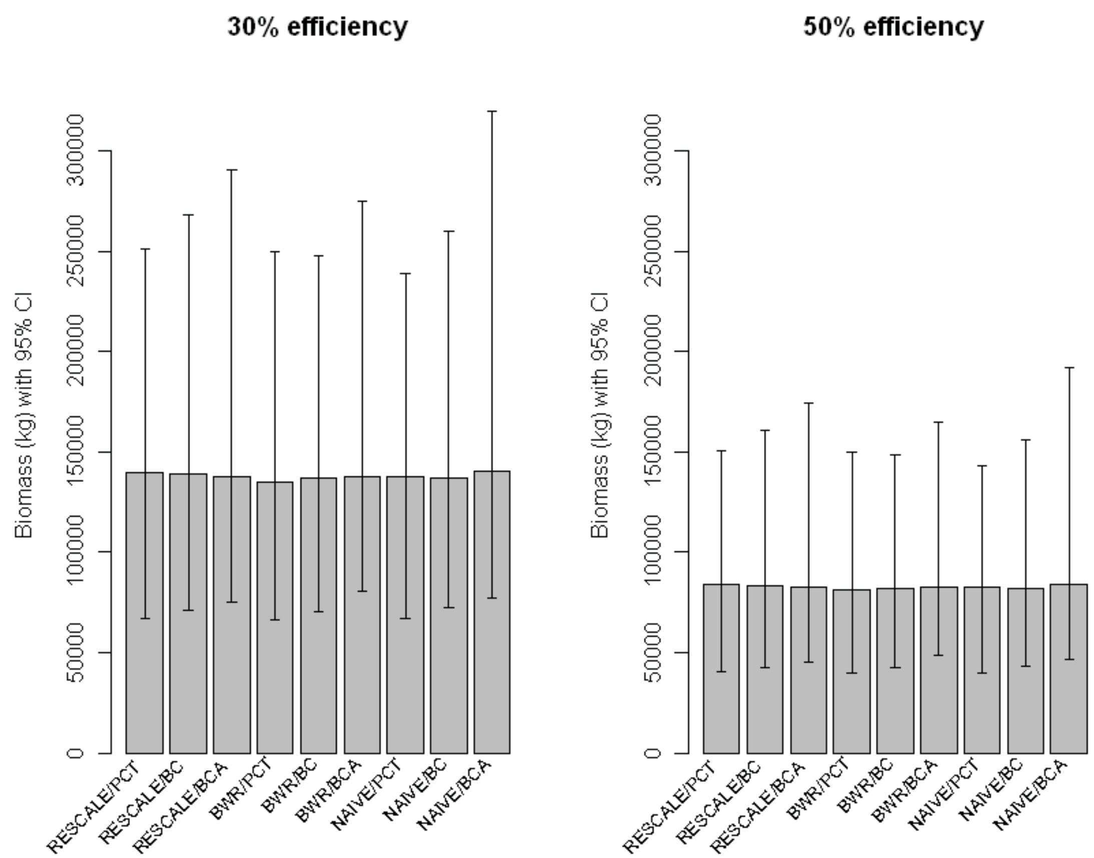
Appendix B6-Figure 4: Individual tow length frequency distributions. Example: SM5A14: 5 represents area 5; A represents subarea A (A is high density, B is medium density, C is low density, D is a tow in state waters); 14 indicates station number.



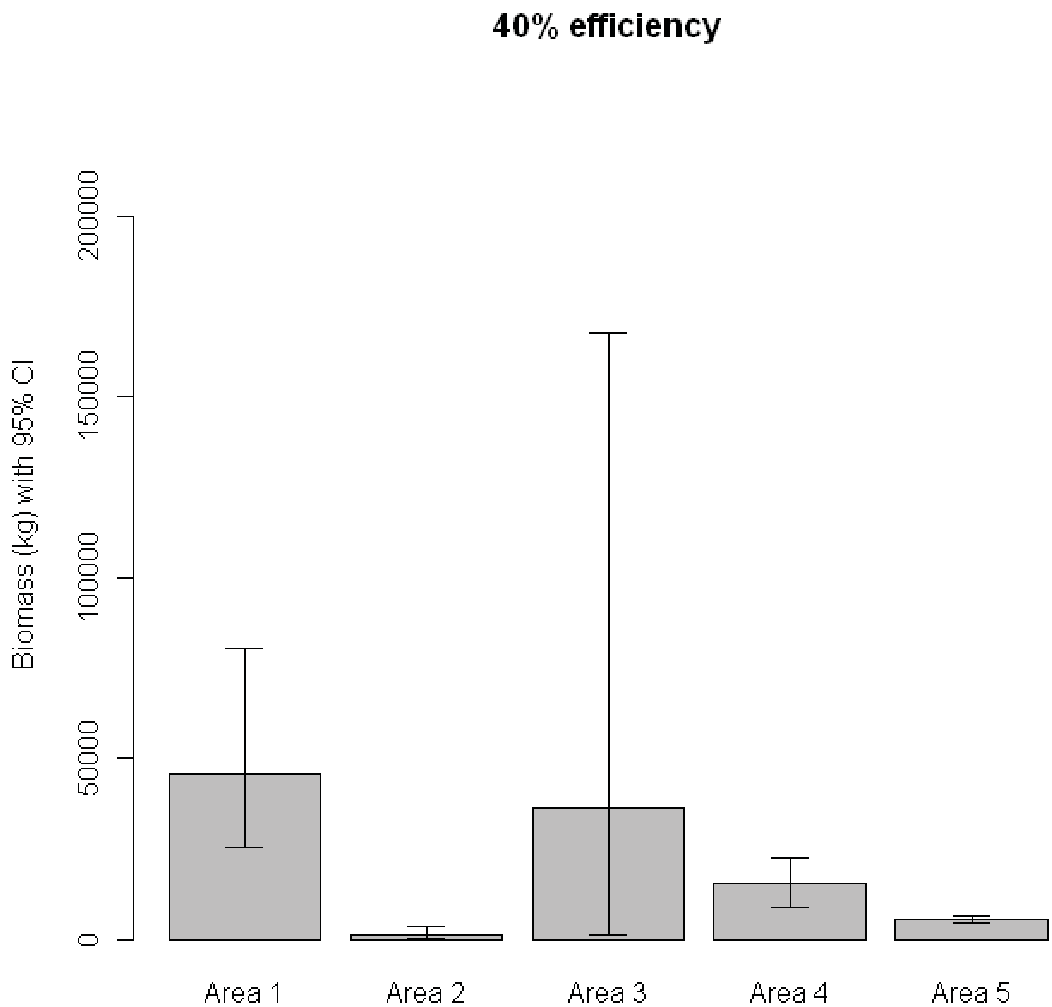
Appendix B6-Figure 5. SH-MW relationship observed for the NGOM survey. The largest meats relative to shell height were found on Stellwagen Bank. The model was $MW_i = \alpha SH_i^{\beta} e^{\varepsilon_i}$. Platts Bank is based on sample size of 8 scallops.



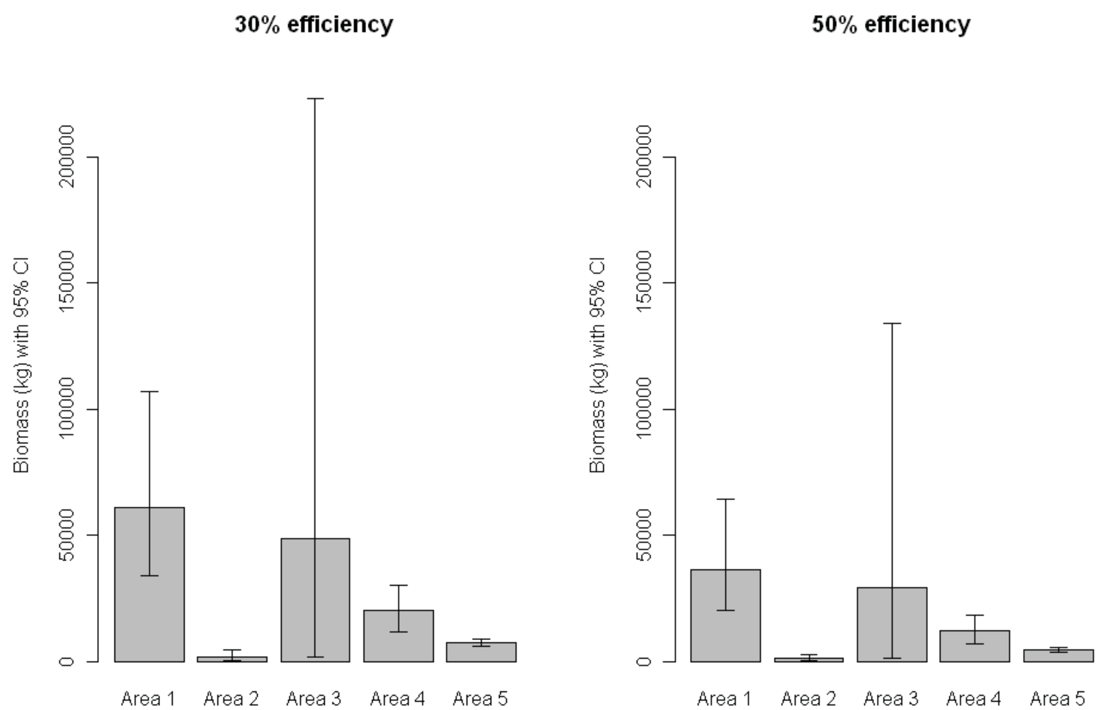
Appendix B6-Figure 6. Mean bootstrapped estimates of NGOM biomass and 95% confidence interval bounds assuming 40% dredge efficiency.



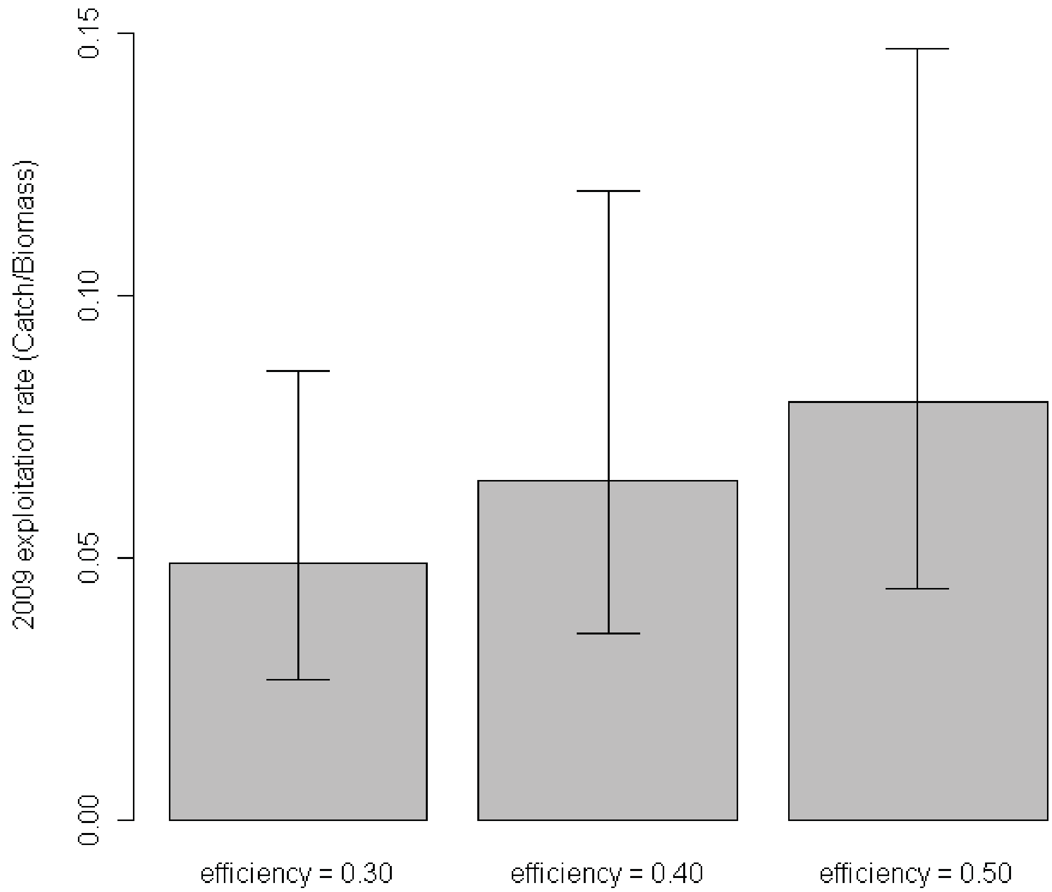
Appendix B6-Figure 7. Mean bootstrapped estimates of NGOM biomass and 95% confidence interval bounds assuming 30% and 50% dredge efficiency.



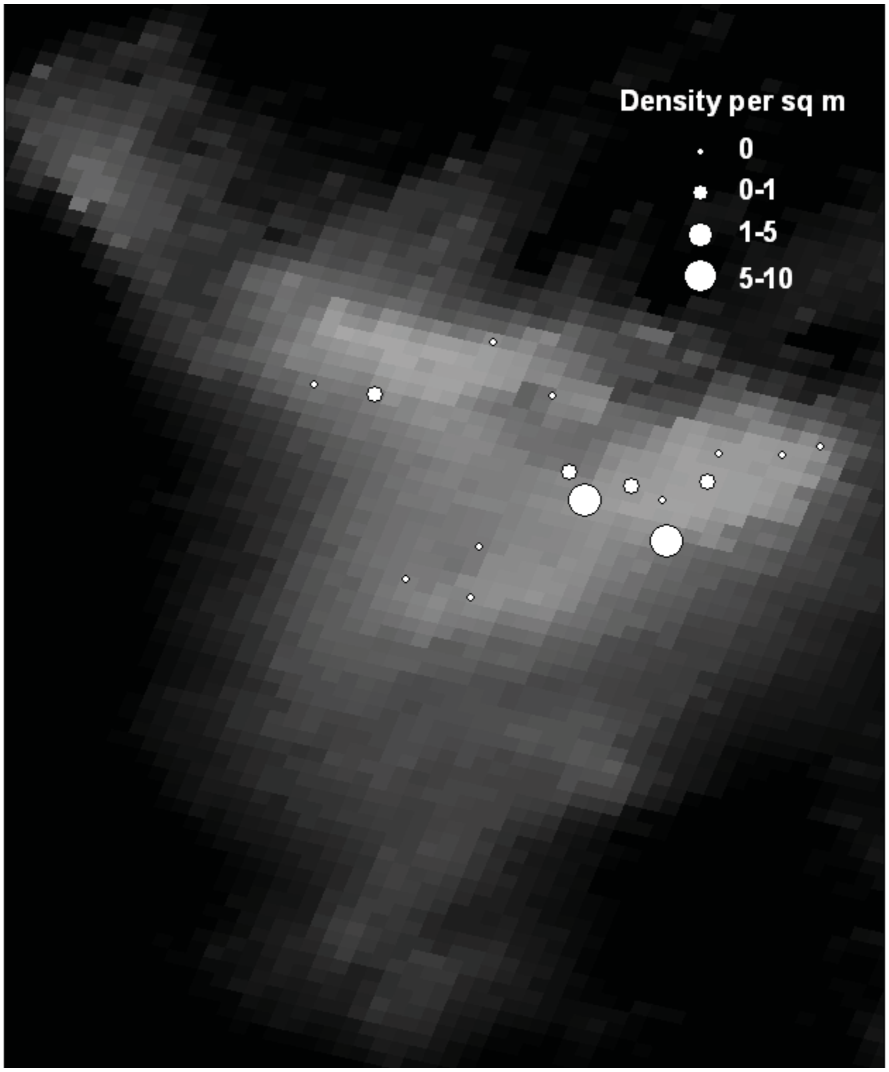
Appendix B6-Figure 8. Mean bootstrapped estimates of NGOM biomass by area and 95% confidence interval bounds using BWR/BC method and assuming 40% dredge efficiency.



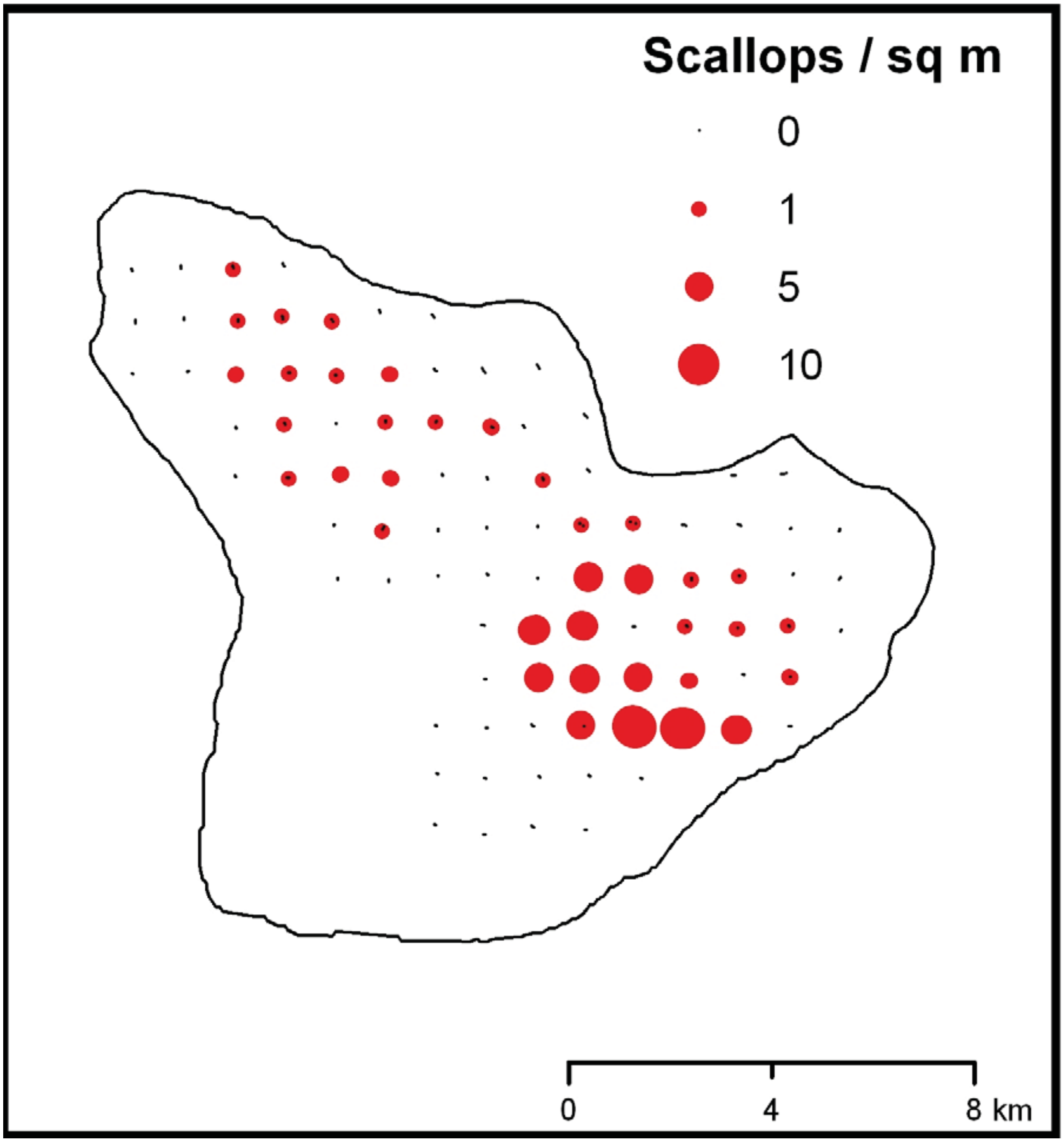
Appendix B6-Figure 9. Mean bootstrapped estimates of NGOM biomass by area and 95% confidence interval bounds using BWR/BC method and assuming 30% and 50% dredge efficiency.



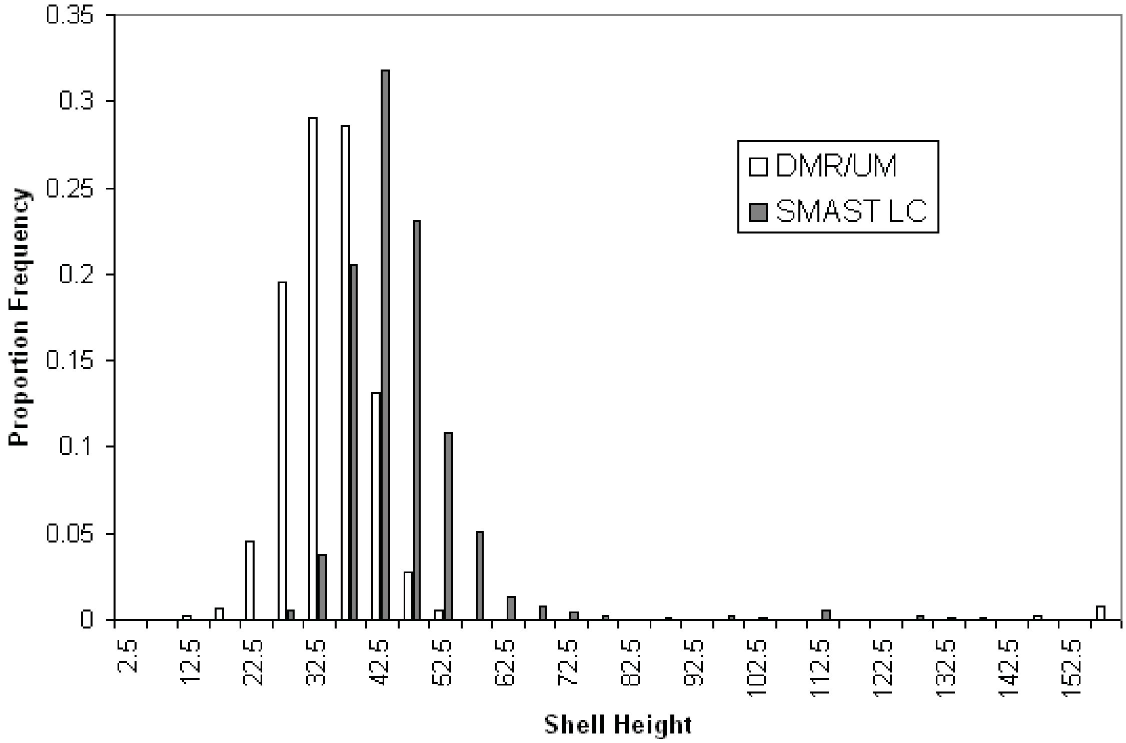
Appendix B6-Figure 10. Estimated NGOM exploitation rates at 30%, 40% and 50% dredge efficiencies with 95% confidence intervals based on BWR/BC method.



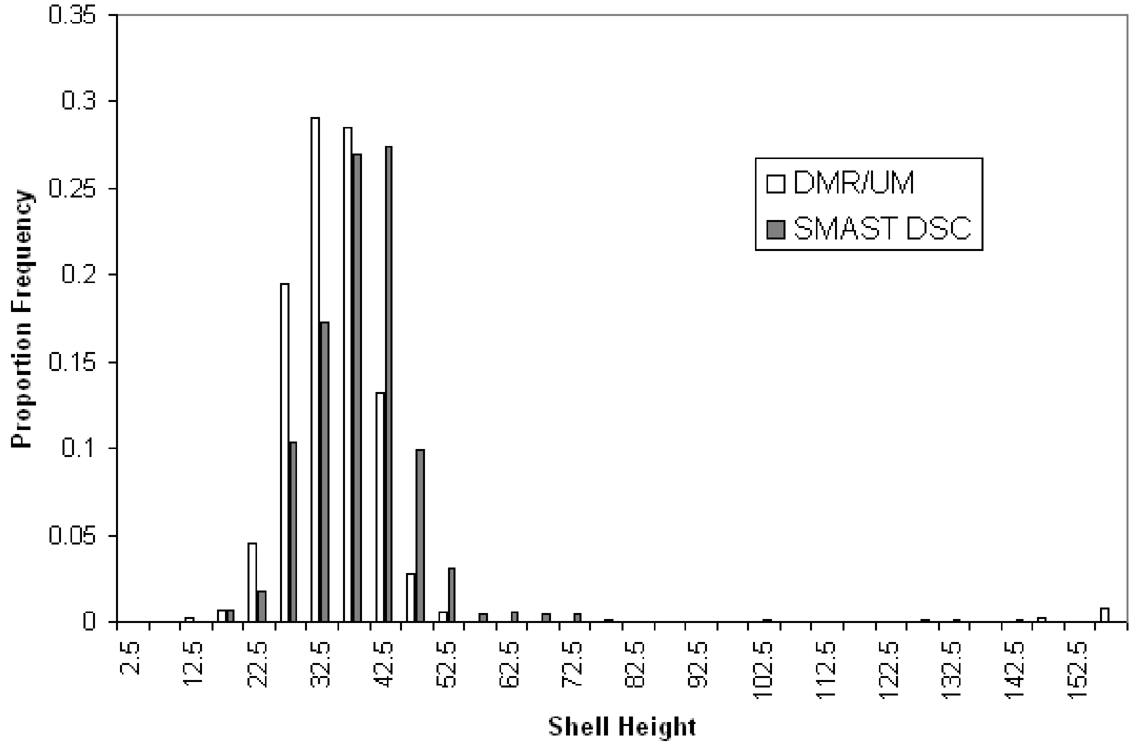
Appendix B6-Figure 11. DMR/UM Platts Bank survey locations indicating density per square meter.



Appendix B6-Figure 12. SMAST Platts Bank survey locations indicating density per square meter.



Appendix B6-Figure 13. Comparison of shell height distribution on Platts Bank between the DMR/UM survey and the SMAST survey (large camera). The DMR survey occurred on July 28th 2009 and the SMAST survey occurred August 12th and 13th 2009.



Appendix B6-Figure 14. Comparison of shell height distribution on Platts Bank between the DMR/UM survey and the SMAST survey (digital still camera). The DMR survey occurred on July 28th 2009 and the SMAST survey occurred August 12th and 13th 2009.

Appendix II:

Murray, Kimberly T. ***Interactions between sea turtles and dredge gear in the U.S. sea scallop (Placopecten magellanicus) fishery, 2001-2008***

Fisheries Research 107 (2011) 137–146

Contents lists available at ScienceDirect

Fisheries Research

journal homepage: www.elsevier.com/locate/fishres

Interactions between sea turtles and dredge gear in the U.S. sea scallop (*Placopecten magellanicus*) fishery, 2001–2008

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ARTICLE INFO

Article history:
Received 2 August 2010
Received in revised form 18 October 2010
Accepted 19 October 2010

Keywords:
Sea turtle
Fisheries interaction
Scallop dredge
GAM
Gear modification

ABSTRACT

Since 2006, the National Marine Fisheries Service (NMFS) has mandated gear modifications ("chain mats") and fishing effort reductions in the U.S. Mid-Atlantic sea scallop dredge fishery to alleviate or minimize interactions with sea turtles. Turtle interactions with gear can be defined as those that are "observable" based on standard fishery observer protocols, plus unobserved interactions, which include both quantifiable and unquantifiable interactions. Once a gear modification is in place, a turtle interaction that was once observable may become unobservable, because the gear modification successfully prevented the turtle from being captured. This paper describes turtle interactions in scallop dredge gear from 2001 to 2008, identifies gear and environmental correlates with observable interaction rates, and reports the average annual number of interactions and adult-equivalent interactions before and after chain mats were mandated in the fishery. Fisheries observer data were used to develop a Generalized Additive Model (GAM) to estimate rates of observable interactions of hard-shelled turtles. These rates were applied to commercial dredge fishing effort to estimate the total number of observable interactions, and to infer the number of unobservable, yet quantifiable interactions after chain mats were implemented. Interaction rates of hard-shelled turtles were correlated with sea surface temperature, depth, and use of a chain mat. The average number of annual observable interactions of hard-shelled turtles in the Mid-Atlantic scallop dredge fishery prior to the implementation of chain mats (1 January 2001 through 25 September 2006) was estimated to be 288 turtles (CV = 0.14, 95% CI: 209–363), which is equivalent to 49 adults. After implementation of chain mats, the average annual number of observable interactions was estimated to be 20 turtles (CV = 0.48, 95% CI: 3–42), equivalent to 4 adults. If the rate of observable interactions from dredges without chain mats had been applied to trips with chain mats, the estimated number of observable and inferred interactions of hard-shelled species after chain mats were implemented would have been 125 turtles per year (CV = 0.15, 95% CI: 88–163). Results from this analysis suggest that chain mats and fishing effort reductions contributed to the decline in estimated turtle interactions after 2006.

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1. Introduction

Over the past decade, scientists, the fishing industry, environmental groups and protected species managers have aimed to reduce or alleviate interactions between sea turtles and dredge gear harvesting sea scallops (*Placopecten magellanicus*) in the U.S. scallop fishery. Studies estimated several hundred loggerhead turtle (*Caretta caretta*) interactions with dredge gear during 2001–2005 in the Mid-Atlantic (Murray, 2004a,b, 2005, 2007), and fisheries observers have documented additional turtle interactions in dredge gear in recent years. Since 2001, observers have mainly reported loggerhead interactions with dredge gear, though they reported 2 Kemp's ridleys (*Lepidochelys kempii*) in dredge gear outside the Mid-Atlantic region (this study). Loggerheads and Kemp's ridley are protected under the U.S. Endangered Species Act (ESA). Interactions between listed species and fishing gear are considered "takes" under the ESA and are prohibited, unless a special exemption has been granted under Section 7 or Section 10 of the ESA.

Protected species managers and the industry have modified scallop dredge gear to reduce the gear's impact on turtles. Turtle "chain mats" have been required in the dredge fishery since 25 September 2006 (Fig. 1), in waters south of 41°9.0′N during May 1–Nov 30 each year (U.S. Department of Commerce, 2009). Chain mats consist of vertical and horizontal chains hung between the sweep and cutting bar and are intended to reduce the severity of some turtle interactions by preventing turtles from entering the dredge bag. Interaction rates between turtles and dredges with and without chain mats are not expected to differ (NMFS, 2008). Monitoring the effectiveness of chain mats is difficult because interactions could still be occurring, but the chain mat prevents the turtle from being captured and observed. Quantifying the maximum potential number of turtle captures prevented by chain mats

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0165-7836/$ – see front matter. Published by Elsevier B.V.
doi:10.1016/j.fishres.2010.10.017

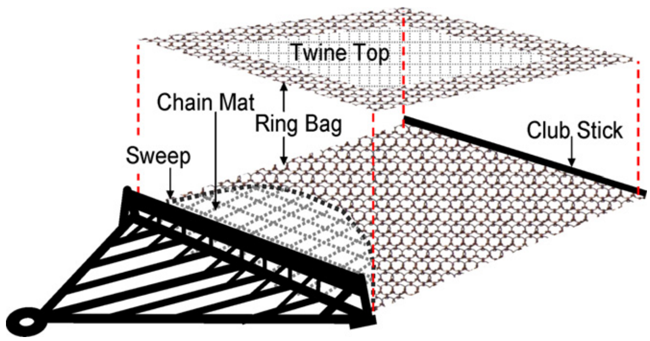

Fig. 1. Sea scallop dredge with turtle chain mat, strung between the sweep and cutting bar on the underside of the dredge bag.

would allow managers and the industry to better evaluate the gear modification.

The distribution of scallop fishing effort in the Mid-Atlantic responds to rotational area management, in which areas are closed to fishing periodically to protect juvenile scallops and then reopened for harvest once scallops reach a certain biomass. The goal of this system is to direct fishing effort to areas of high scallop biomass, thereby increasing scallop catch-per-unit-effort, while protecting juvenile scallops. Fishing activity inside the management areas is controlled via trip and possession limits, and outside of the management areas via days at sea limitations. The distribution and intensity of scallop fishing is very dynamic from year to year, as fishers respond to effort controls and the market.

While the Mid-Atlantic sea scallop fishery operates year-round, loggerhead turtles are typically present on the fishing grounds from late spring/early summer to the fall (Shoop and Kenney, 1992; Morreale and Standora, 2005; Hawkes et al., 2007; Mansfield et al., 2009). Fishery managers have implemented time/area closures or effort reductions in the Mid-Atlantic to minimize the industry's interactions with loggerheads. In order to balance turtle protection with the goals of rotational area management, fishing effort for the year remains allocated based on the scallop resource but limited in times and areas when turtles are present in the Mid-Atlantic (Fig. 2). For example, beginning in 2006 the National Marine Fisheries Service (NMFS) closed the "Elephant Trunk" sea scallop access area in the Mid-Atlantic from September 1 to October 31 to reduce sea turtle interactions, based on historic patterns of observed interactions in that area (U.S. Department of Commerce, 2006). Fishers can still take their allocated number of trips in this area, with the exception of September and October. In managing the fishery, NMFS must consider other times and areas for effort reductions each year to reduce impacts on sea turtles (NMFS, 2008).

This analysis estimates turtle "interactions" rather than "bycatch". Bycatch typically refers to discarded plus retained incidental catch (Alverson et al., 1994), and may also include unobserved mortality (NMFS, 1998). In the case of ESA protected species, bycatch estimates typically include animals captured in the bag or observed interacting with the gear (Murray, 2004a,b, 2005, 2007, 2009), both of which are considered "takes" under the ESA. Once a gear modification is in place, interactions may still occur but will not be observed if the modification successfully prevents capture of the animal. Therefore, traditional methods to estimate bycatch will under-represent the level of takes in the fishery.

The total number of interactions can be defined as those that are "observable" based on standard fishery observer protocols, plus unobserved interactions, which include both quantifiable and unquantifiable interactions. Unobserved, quantifiable interactions can be estimated after a gear modification is in place, based on what is known about gear and environmental factors affecting observable interaction rates. Unobserved, unquantified interactions will

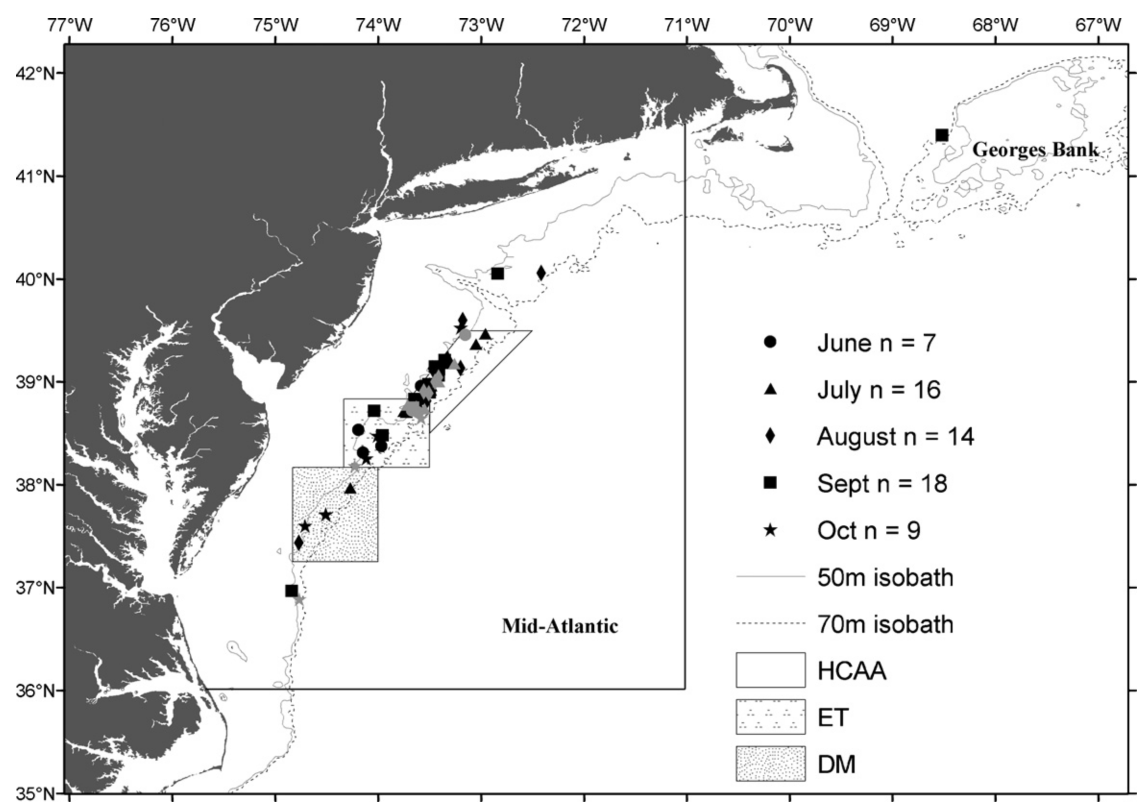

Fig. 2. Distribution of observed sea turtles in scallop dredge gear during on-watch hauls 2001–2008, showing boundaries of Mid-Atlantic study area and Mid-Atlantic scallop fishery management areas. Unidentified turtle species are in gray, and the turtle outside of the study area is a Kemp's ridley. HCAA = Hudson Canyon Access Area, ET = Elephant Trunk, DM = Delmarva.

occur whether there is a gear modification or not, but cannot be estimated due to a lack of evidence.

The purposes of this paper are to: (a) characterize turtle interactions in scallop dredge gear during 2001–2008; (b) identify factors correlated with estimated rates of observable interactions of hard-shelled turtle species over this time period in the Mid-Atlantic; (c) estimate the average annual number of observable interactions prior to the implementation of chain mats; and (d) estimate the average annual number of observable interactions plus unobserved, quantifiable loggerhead interactions after implementation of chain mats. This analysis also reports adult equivalent interactions, an important metric for understanding population level impacts of fisheries interactions (Haas, 2010). Results from this analysis will increase information available to fisheries managers, industry, and researchers aiming to understand and reduce the impacts of scallop dredge gear on turtles in the western North Atlantic.

2. Methods

2.1. Study region

The U.S. commercial scallop dredge fishery occurs mainly in the Mid-Atlantic and on Georges Bank. From 2001 to 2008, 25% of commercial scallop dredge effort (i.e. fishing hours) was outside of the Mid-Atlantic, where 2 Kemp's ridley turtle were observed. To date, observed turtle catches on Georges Bank are too rare to produce scientifically-defensible estimates of sea turtle interactions with scallop dredge gear. Therefore, an estimate for hard-shelled turtle species was calculated only for the Mid-Atlantic, defined in this study as west of 71°W and south of 42°N, to the southern limit of the distribution of the sea scallop dredge fishery (~36°N), extending westward to the coastline.

2.2. Data sources

2.2.1. Observer data

Data collected by NMFS Northeast Fisheries Science Center observers aboard commercial scallop dredges during 2001–2008 were analyzed to derive sea turtle interaction rates, expressed as the number of observed turtles per fishing hour. Observable interaction rates were estimated based on turtles reported via standard Northeast Fisheries Observer Program (NEFOP) sampling protocols when an observer was "on-watch", i.e. systematically collecting data on the haul characteristics, the catch, and details of any protected species interaction. Observable interaction rates were based on turtles either captured in or on the dredge gear, or observed interacting with the gear. Observers may collect data opportunistically when they are "off-watch", but these data are not used in the calculation of interaction rates because it is not known what fraction of off-watch interactions are reported. The quality of information collected by observers on turtles caught during on and off-watch hauls does not differ, so off-watch observations of turtles are included only in the description of fisheries interactions. Observers sampled roughly 3% of commercial fishing effort in the Mid-Atlantic during 2001–2008 (Table 1), proportional in space and time to commercial effort throughout the year.

2.2.2. Commercial data

Mandatory Vessel Trip Reports (VTRs) completed by commercial scallop fishermen during 2001–2008 provided a measure of total fishing effort. "Fishing hour" was the total amount of hours spent fishing per dredge. Trips used either 1 dredge (55%) or 2 dredges (45%). Dredge trips were coded as using a chain mat if they fished south of 41°9.0′N during 1 May to 30 November after September 25, 2006 (34% of all trips), when chain mats became mandatory in the fishery.

2.2.3. Sea surface temperature (SST) and chlorophyll (CHL) data

Sea surface temperature (SST) data were obtained for all VTR scallop dredge trips from 5-day SST composites derived from AVHRR Pathfinder Version 5, Modis Aqua, Modis Terra, and GOES satellites, or 5-day climatology images downloaded from NASA's Jet Propulsion Laboratory (Warden and Orphanides, 2008). Similar data were obtained for observed hauls for which SST data were missing (35%, because observers did not collect SST prior to 2004). Satellite-derived SST differed from observer recorded data on average by 0.2 °C (R^2 = 0.90). Surface chlorophyll *a* concentrations were obtained for all VTR and observed trips from five day composites of SeaWiFS high resolution satellite images from 2001 to 2008 (Warden and Orphanides, 2008).

2.3. Analytic approach

2.3.1. Estimation of observable interaction rates

2.3.1.1. Interaction rate model. Unidentified hard-shelled species were pooled with loggerhead turtles to estimate rates of observable interactions. It is likely that all or most of the unidentified turtles are loggerheads because all positively-identified observed turtles in the Mid-Atlantic were loggerheads and observer comments regarding unidentified turtles were consistent with loggerhead characteristics. Interaction rates were expressed as:

$$R = \frac{\text{number of observed turtles}}{\text{observed fishing hour}} \quad (1)$$

A Generalized Additive Model (GAM) with a Poisson distribution (GAM function, SPLUS 7.0) was used to model the expected turtle interaction rate. The form of the Generalized Additive Model (GAM) can be written as:

$$\mathrm{Log}(E[y_j]) = \log(\text{fishing hours}_j) + \alpha + \sum_{i=1}^{n} f_i(x_{ij}) + \xi \quad (2)$$

where y_j is the number of hard-shelled turtles observed on the jth haul, α is a constant intercept term, f_j are a series of smooth-

Table 1
Observer and commercial fishing effort, coverage levels, and observed on-watch turtles by year in Mid-Atlantic dredge gear. VTR = Vessel Trip Report commercial data; OC = Percent observer coverage, expressed as: (observed fishing hours/VTR fishing hours × 100). Cc = *Caretta caretta*, Lk = *Lepidochelys kempii*, Ui = Unidentified.

Year	Observed dredge hours	VTR dredge hours	OC	Cc	Lk	Ui
2001	9440	512,980	2%	2	0	9
2002	13,651	614,502	2%	15	0	2
2003	16,632	651,436	3%	17	0	5
2004	26,884	656,958	4%	8	0	0
2005	16,886	567,034	3%	0	0	0
2006	5175	324,973	2%	1	0	0
2007	12,711	386,143	3%	2	1	0
2008	24,280	430,438	6%	2	0	0
Total	125,658	4,144,464	3%	47	1	16

ing functions for each predictor variable, x_i describe environmental or fishing characteristics at each haul, and ξ is unexplained error (Hastie and Tibshirani, 1990).

2.3.1.2. Model selection process. Nine variables were tested in the model selection process. These variables were chosen based on *a priori* knowledge of factors affecting estimated interaction rates in scallop fisheries (Murray, 2004a,b, 2005, 2007) or anecdotal information. These included: sea surface temperature, depth, latitude, chlorophyll, use of a chain mat, time of day when the turtle was captured (binned into six 4 h periods), number of hauls made on a trip, the amount of scallop tons landed, and frame width of a dredge. After the preferred model was selected, year, spatial area, and month were tested to see if they explained significantly more variation in interaction rates than what was already explained by the preferred model. Spatial area referred to three scallop management areas and the open area outside the management areas. The model selection process was repeated separately with only loggerheads as the response to evaluate whether factors affecting estimated interaction rates changed.

The nine primary variables were tested in a forward stepwise model selection process (step.gam function, SPLUS 7.0). The null model consisting of the overall mean was the initial model in the stepwise procedure. At each step, the forward stepwise algorithm selected that variable which generated the greatest change in the Akaike Information Criterion (AIC) relative to all other model variables. Continuous variables were considered as smooth terms in the model using the default degrees of freedom in the fitting procedure. To ensure the step.gam procedure did not over fit, variables were also manually added to the null model, in the order in which the automated procedure selected the variables, and then evaluated with respect to the amount of deviance reduced. Variables that had a small change in AIC (i.e. <7), or that reduced the deviance by <2%, were not included in the model (Burnham and Anderson, 2002).

The final model was examined for overdispersion, measured by calculating the dispersion parameter (ϕ), defined as:

$$\phi = \frac{\Sigma(y_i - \hat{\mu}_i)^2/\hat{\mu}_i}{\text{residual df}} \quad (3)$$

2.3.2. Estimated turtle interactions

The final model was applied to VTR trips to derive an estimated hard-shelled turtle interaction rate for each VTR trip, and to estimate the number of observable interactions on each VTR trip. Total estimated observable interactions were the sum of the predicted number of turtle interactions over all trips in a year. Estimated loggerhead interactions were also derived by re-parameterizing the final model with loggerheads as the response and then applying the model in the same manner to VTR trips.

Unobserved, quantifiable interactions were estimated by applying the observed interaction rate of dredges with no chain mats to dredges with chain mats. To do this, both the hard-shelled turtle and loggerhead model were applied to VTR trips coded for having no chain mat. These additional unobserved interactions were estimated to have occurred, but were not observable because the chain mat prevented turtles from entering the dredge bag. The difference between the observable estimates and the unobserved but quantifiable estimates represents the number of turtle captures avoided due to the chain mat.

Bootstrap resampling was used to derive CVs around the average annual interaction estimates. Bootstrap replicates were generated by sampling hauls with replacement 1000 times from the original observer dataset, and then the preferred model parameterized with each replicate. Estimated interactions in each year were calculated by applying each replicate dataset to VTR dredge effort; 2006 was split into two periods, before and after chain mats. For each replicate, estimates of annual interactions were averaged in each time period (i.e. pre and post chain mat). CVs and 95% CIs around the average annual estimates were computed from the bootstrap replicates.

2.3.3. Estimated adult equivalent interactions

Observed sea turtles were grouped into size classes based on the six loggerhead life stages (TEWG 2009): Stage I (≤16.2 cm CCL), Stage II juvenile (>16.21–60.45 cm CCL), Stage III juvenile (>60.45 cm–75.72 cm CCL), Stage IVa juvenile (>75.72–88.61 cm CCL), Stage IVb juvenile (>88.61–101.5 cm CCL), and Stage V adult (>101.5 cm CCL). Because the life stages overlap (TEWG, 2009), size classes were truncated at the intersection of each life stage to create discrete size classes (Fig. 3a). Reproductive values (RV), defined as the contribution that the individual makes to current and future reproduction (Fisher, 1930), were assigned to the mid-point of each size class based on Wallace et al. (2008). Stage IV turtles were subdivided because RVs vary widely in this life stage. RVs assigned to each respective stage class were: 0.002, 0.008, 0.040, 0.124, 0.547, and 1.0. Similar RVs have been used for loggerheads (Bolten et al., 2010). RVs reported in Bolten et al. (2010) were not used because the RVs were based on ages rather than size, and included information on breeding/non-breeding adult stages which fisheries observers do not collect.

The number of estimated adult equivalent (AE) interactions over all six life stages and all eight years was calculated as:

$$\text{AE} = \sum_{j=1}^{8}\sum_{i=1}^{6} B_j * P_i * \text{RV}_i \quad (4)$$

where B = total estimated turtle interactions in dredge gear in year j, P = the proportion of loggerheads observed in life stage i, and RV_i = the reproductive value for life stage i. Loggerhead RVs and size classes were applied to the estimated hard-shelled interactions and the loggerhead interactions because unidentified turtles were not measured and many were likely loggerheads. It is assumed the unidentified turtles followed the same size distribution as the observed loggerheads. If the unidentified turtles were disproportionately smaller, the estimated adult equivalent interactions would be biased high, or if some were Kemp's ridleys the estimate would be biased low.

3. Results

During 2001–2008, observers reported 47 loggerheads, 1 Kemp's ridley, and 16 unidentified turtle interactions in scallop dredge gear (Table 1, Fig. 2). In addition, 15 turtle interactions (9 loggerheads, 1 Kemp's ridley, 5 unidentified) occurred on hauls when an observer was "off-watch" and were excluded from the rate analysis. Lastly, 8 severely decomposed turtles were caught in scallop dredge gear from 2001 to 2008, though these turtle were also excluded from the analysis because the state of decomposition suggested they died prior to interacting with the gear.

3.1. Characteristics of observed interactions

3.1.1. Temporal and spatial distribution

During 2001–2008, observers recorded loggerhead interactions between June 17 and Oct 14, from 36°53′N to 40°3′N. Loggerhead interactions occurred in waters 36–68 m deep, and in surface water temperatures ranging from 18 °C to 25 °C. The unidentified species of turtles were observed within the same time and area as loggerheads. The 2 Kemp's ridley turtles were observed north of 40°55′N and east of 70°W. One Kemp's ridley was observed in September in waters 77 m and 16 °C; the other occurred in August but the

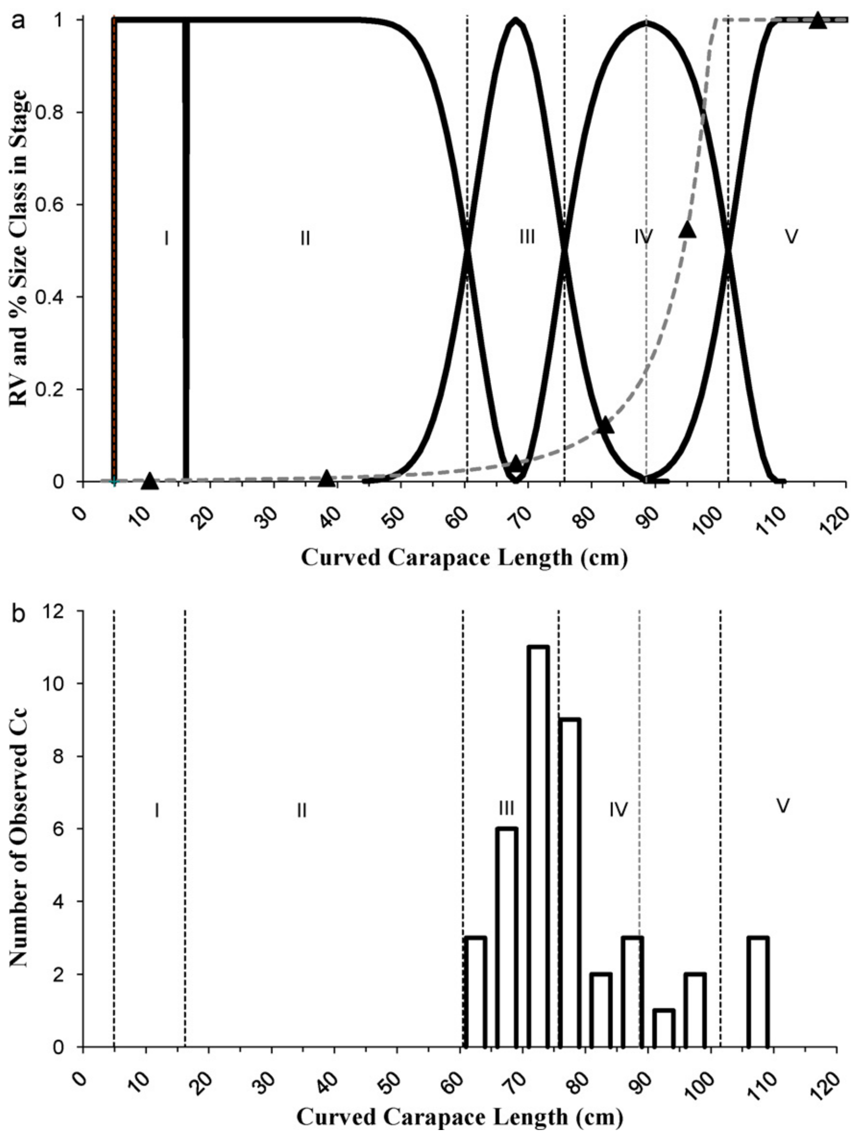

Fig. 3. (a) Loggerhead life stage (TEWG, 2009) and Reproductive Values (Wallace et al., 2008) (gray dashed line). Size class breaks are represented by dashed lines, and RVs at the mid-point of each size class represented by black triangles; (b) Distribution of observed loggerhead turtle sizes overlaid on life stage classes (dashed lines).

observer was "off-watch" and did not record depth or temperature information on the haul.

3.1.2. Turtle sizes and life stage

Curved carapace length (CCL, curvilinear length of the carapace from the nuchal notch to the posterior marginal tip measured to the nearest 0.10 cm) and curved carapace width (CCW, curvilinear width of the carapace across the widest part of the shell) of the observed loggerheads ranged between 62 and 107 cm CCL and 45 and 99 cm CCW ($n = 40$ turtles) (Fig. 3b). Sizes of observed loggerheads corresponded to Stage III (53%), Stage IV (40%), and Stage V (7%) life stage classes. One Kemp's ridley was 24.3 cm CCL and 26 cm CCW; the other Kemp's ridley and unidentified turtles were not measured.

3.1.3. Animal condition

During 2001–2008, 88% ($n = 49$) of observed loggerheads interacting with dredge gear during on and off-watch hauls were alive (with or without injuries), and 12% ($n = 7$) were dead. One Kemp's ridley was alive and the other was dead. All of the unidentified species were alive. Seventy-eight percent ($n = 18$) of the Stage III loggerheads were alive, and 100% were alive in Stage classes IV and V.

3.1.4. Entanglement situations

Entanglement situations are reported here for turtles observed in dredge gear from 2006 to 2008 only, because detailed descriptions of interactions between observed turtles and scallop dredge gear prior to this time have been described in Haas et al. (2008). Five loggerheads were caught in dredge gear equipped with chain mats, including two which occurred on off-watch hauls (Table 2). With the exception of one chain mat, all of the chain mats were properly configured. On properly configured chain mats the horizontal chains must intersect the vertical chains such that the length of each side of the openings formed by the intersecting chains is less than or equal to 14″ (35.5 cm), with the exception of the side of any individual opening created by the sweep (50 CFR 223.206(d)(11)). Two loggerheads and a Kemp's ridley were captured in hauls without chain mats (two were before or outside of the regulatory period/area, and the other had improper connections in the chains so was considered to have no chain mat).

Table 2
Entanglement situations of sea turtles observed in scallop dredge gear, 2006–2008. Cc = *Caretta caretta*, Lk = *Lepidochelys kempii*.

	Chain mat properly configured	Species	Animal condition	Position of entanglement, per observer/captain comments
Dredge with chain mat	Y	Cc	Alive, injured	Turtle stuck on the outside of the turtle chain mat
	Y	Cc	Alive, injured	Turtle on top of dredge frame
	N	Cc	Alive, injured	Chains measured 16"at top and 20" at bottom. Loggerhead caught inside the dredge bag.
	Y	Cc	Dead	Turtle wedged between bale bars
	Y	Cc	Dead	Turtle wedged between bale bars
Dredge without chain mat	N/A	Cc	Alive, injured	Turtle caught inside dredge bag
	N/A	Lk	Dead	Turtle caught inside dredge bag
	N/A	Cc	Alive, injured	Turtle hanging on outside of dredge bag by its flipper

3.2. Commercial effort characteristics

Commercial fishing effort in the Mid-Atlantic declined in scope and magnitude after the implementation of chain mats (Figs. 4 and 5). Fishing effort in the Mid-Atlantic is influenced by scallop rotational management that results in higher scallop catches per unit effort, days at sea allocations in the fishery, and management actions to shift effort from areas and times of potential turtle interactions. From 2001 to September 2006 (prior to chain mats), the average dredge hours fished per year from November to May was ∼260,000 h, and from June to October was ∼248,000 h. From September 2006 to 2008, the average dredge hours fished per year from November to May was ∼148,000 h, and from June to October was ∼119,000 h. During the months sea turtles are generally present in the Mid-Atlantic (June–October), effort declined by roughly 52%.

3.3. Estimation of observable interaction rates

3.3.1. Interaction rate model

Factors correlated with observable interaction rates of hard-shelled turtles in the Mid-Atlantic sea scallop dredge fishery included: SST (smoothed), depth (smoothed), and use of a chain mat (Table 3 and Fig. 6). Cumulatively these variables explained 21% of the variation in observable interaction rates. Year, spatial area, and month explained <1% additional variance over these variables so were not included in the final model. Factors correlated with observable rates of pooled species (unidentified and

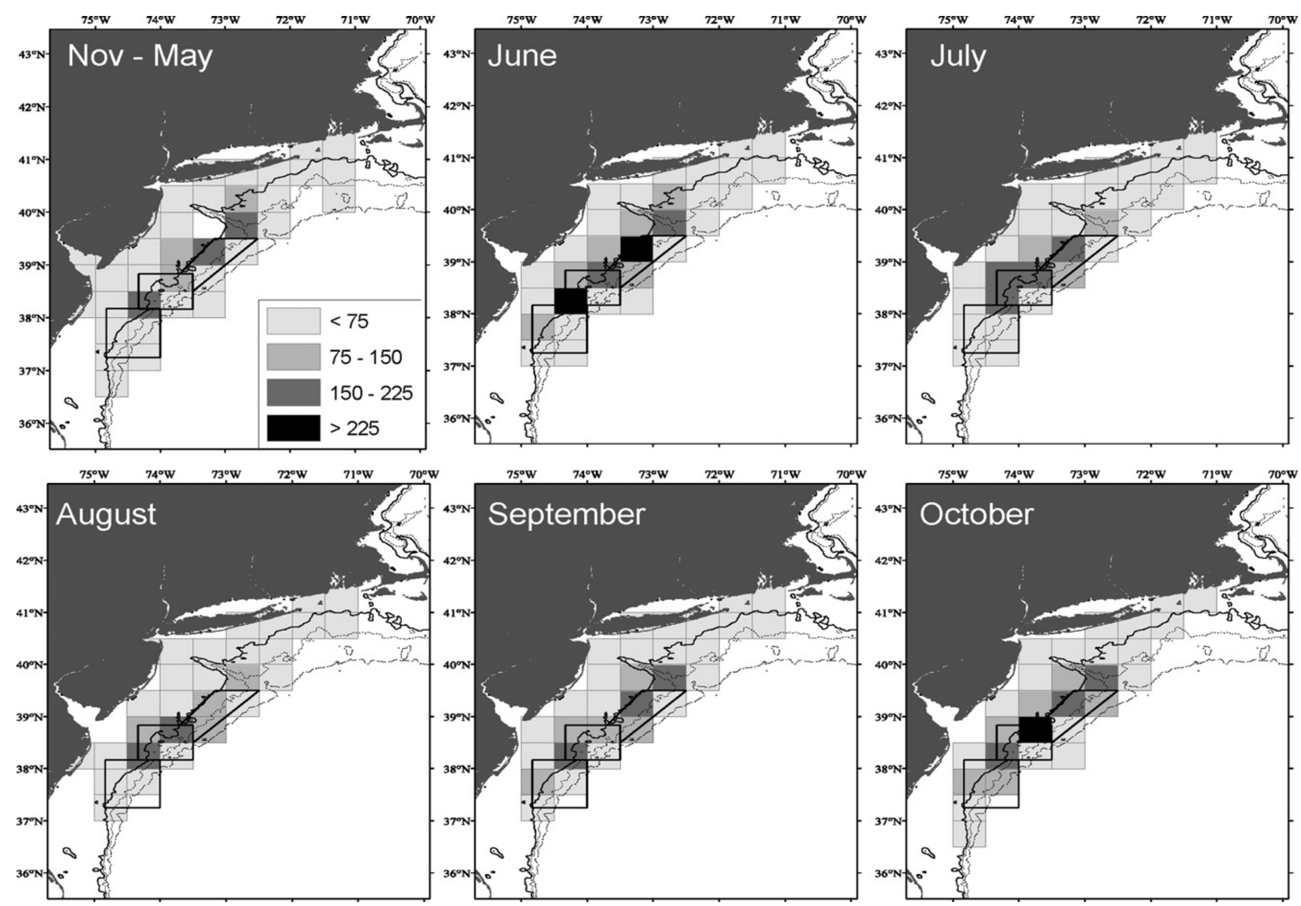

Fig. 4. Distribution over 30' squares of commercial fishing effort on VTR dredge trips, 2001–September 25 2006 (pre chain mats). Each square represents the total amount of dredge hours fished per day in each stratum (where stratum is month block within 2001–September 25 2006). Squares with fewer than 10 VTR trips have been excluded. The 50 m, 70 m, and 200 m bathymetry lines are shown. From north to south, the Hudson Canyon Access Area, Elephant Trunk, and Delmarva scallop management areas are represented by the black rectangles.

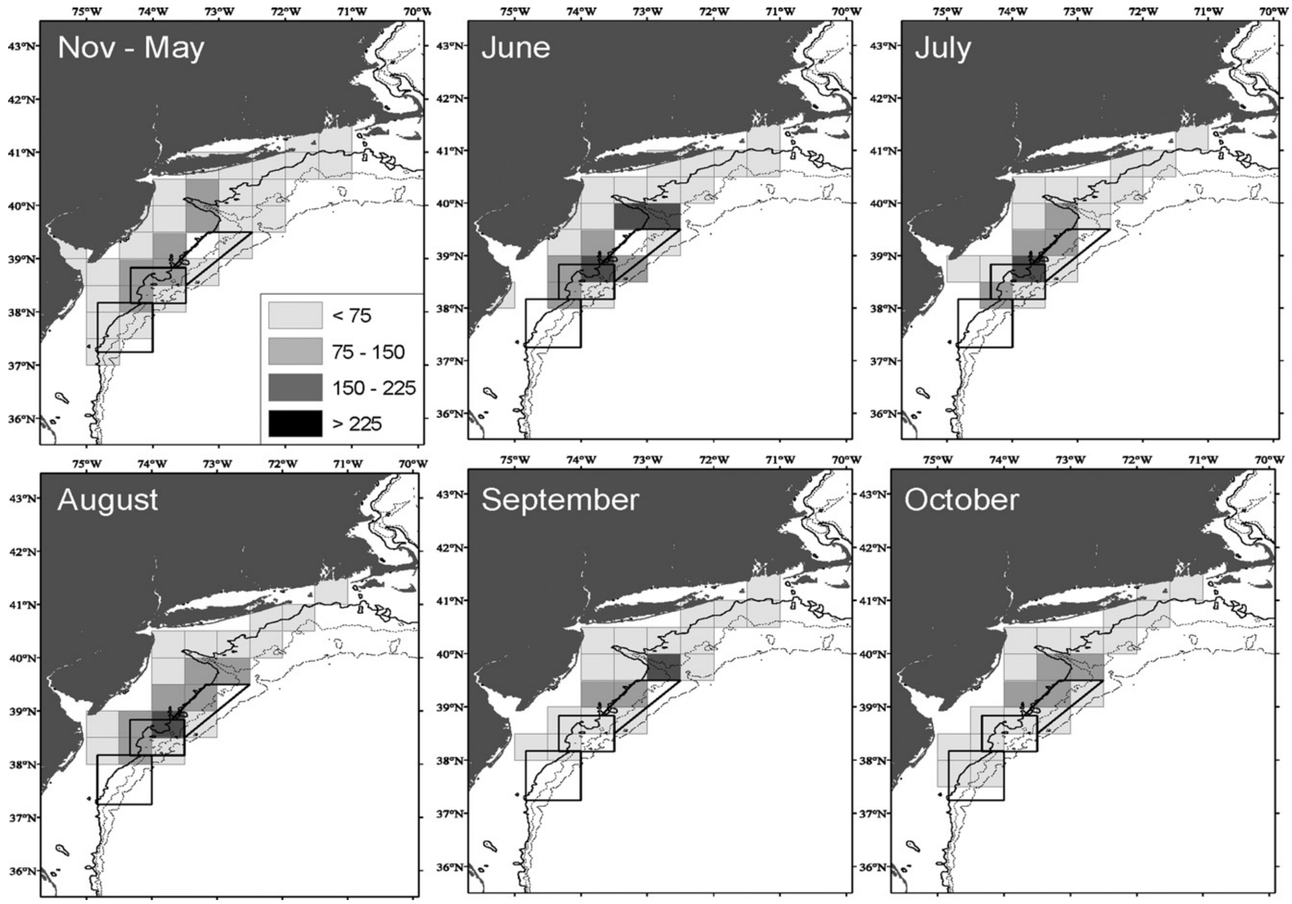

Fig. 5. Distribution over 30' squares of commercial fishing effort on VTR dredge trips, September 26 2006–2008 (post chain mats). Each square represents the total amount of dredge hours fished per day in each stratum (where stratum is month block within September 26 2006–2008). Squares with fewer than 10 VTR trips have been excluded. The 50 m, 70 m, and 200 m bathymetry lines are shown. From north to south, the Hudson Canyon Access Area, Elephant Trunk, and Delmarva scallop management areas are represented by the black rectangles.

loggerheads) were the same as those when modeling only loggerheads as the response. The estimated dispersion parameter of the selected model was 0.90, indicating no overdispersion (Burnham and Anderson, 2002).

The model suggests that the observable interaction rate of a chain mat equipped dredge is ~1/7 the rate of a dredge without a chain mat, when holding all other variables constant in the model. When the interaction rate of dredges without chain mats was applied to VTR trips in the Mid-Atlantic, the average estimated rates were highest from July to October (Fig. 7). The higher rates in October were primarily south of 39°N.

3.4. Estimated interactions

The average annual amount of observable turtle interactions in the Mid-Atlantic scallop dredge fishery from 2001 to 25 September 2006 (prior to the implementation of chain mats) was 288 estimated hard-shelled species per year (CV = 0.14, 95% CI: 209–363),

Table 3
Variables examined in an analysis of factors correlated with rates of observable interactions of loggerhead turtles in dredge gear. "Secondary" variables were tested separately, after the best-fitting candidate model was selected. The selected model is highlighted in gray.

Model structure	Residual d.f.	Residual deviance	Cumulative % of deviance explained	AIC statistic	Pr (Chi)
Primary variables					
Null model	66,580.0	873.6		875.6	
Null + s(SST)	66,576.2	752.0	0.139	761.6	0.00
Null + s(SST) + s(depth)	66,572.2	708.5	0.189	726.2	0.00
Null + s(SST) + s(depth) + chain mat	66,571.2	688.4	0.212	708.0	0.00
Null + s(SST) + s(depth) + chain mat + s(scallop tons)	66,567.3	676.9	0.225	704.4	0.02
Null + s(SST) + s(depth) + chain mat + s(scallop tons) + s(latitude)	66,567.3	679.4	0.222	706.8	0.06
Null + s(SST) + s(depth) + chain mat + s(chlorophyll a)	66,567.3	685.4	0.215	712.8	0.54
Null + s(SST) + s(depth) + chain mat + time bin	66,570.2	687.0	0.214	708.6	0.24
Null + s(SST) + s(depth) + chain mat + number of hauls	66,570.2	688.2	0.212	709.9	0.72
Null + s(SST) + s(depth) + chain mat + dredge frame width	66,570.2	688.0	0.212	709.7	0.55
Secondary variables					
Null + s(SST) + s(depth) + chain mat + year	66,570.2	680.5	0.221	702.2	0.01
Null + s(SST) + s(depth) + chain mat + spatial area	66,566.2	677.5	0.224	707.2	0.05
Null + s(SST) + s(depth) + chain mat + month	66,560.3	687.0	0.214	728.4	0.10

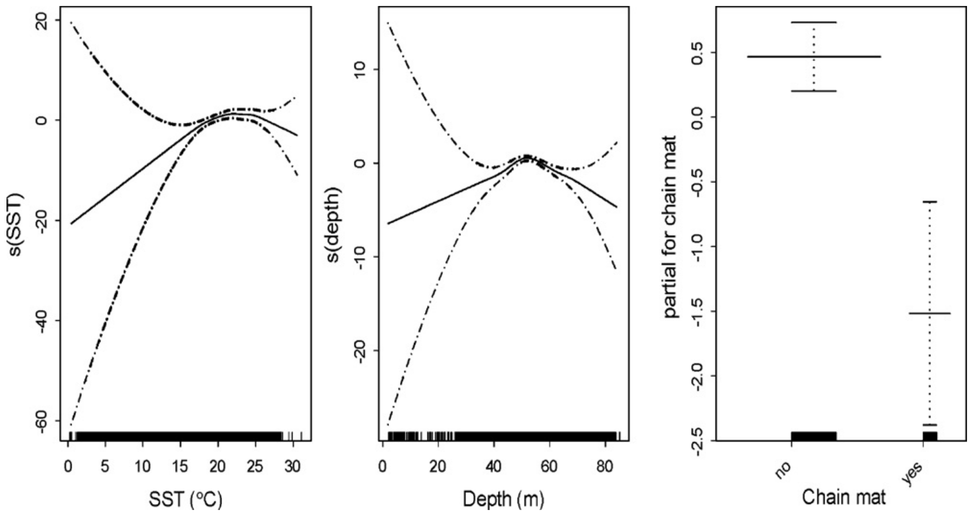

Fig. 6. Generalized additive model smoothers depicting effect of sea surface temperature, depth, and chain mats on hard-shelled turtle interaction rates. Rugplot on *x*-axis shows the number of observations; dashed lines are 95% confidence intervals.

which equates to 49 adult equivalents, and 218 loggerheads (CV = 0.16, 95% CI: 149–282), which equates to 37 adult equivalents (Table 4).

From 26 September 2006 to 2008 (after the implementation of chain mats) the average annual amount of observable interactions was 20 estimated hard-shelled turtles per year (CV = 0.48, 95% CI: 3–42), which equates to 4 adult equivalents, and 19 loggerheads (CV = 0.52, 95% CI: 2–41), which equates to 3 adult equivalents.

If the observable interaction rate from dredges without chain mats had been applied to trips that used chain mats from 26 September 2006 to 2008, the estimated number of observed inter-

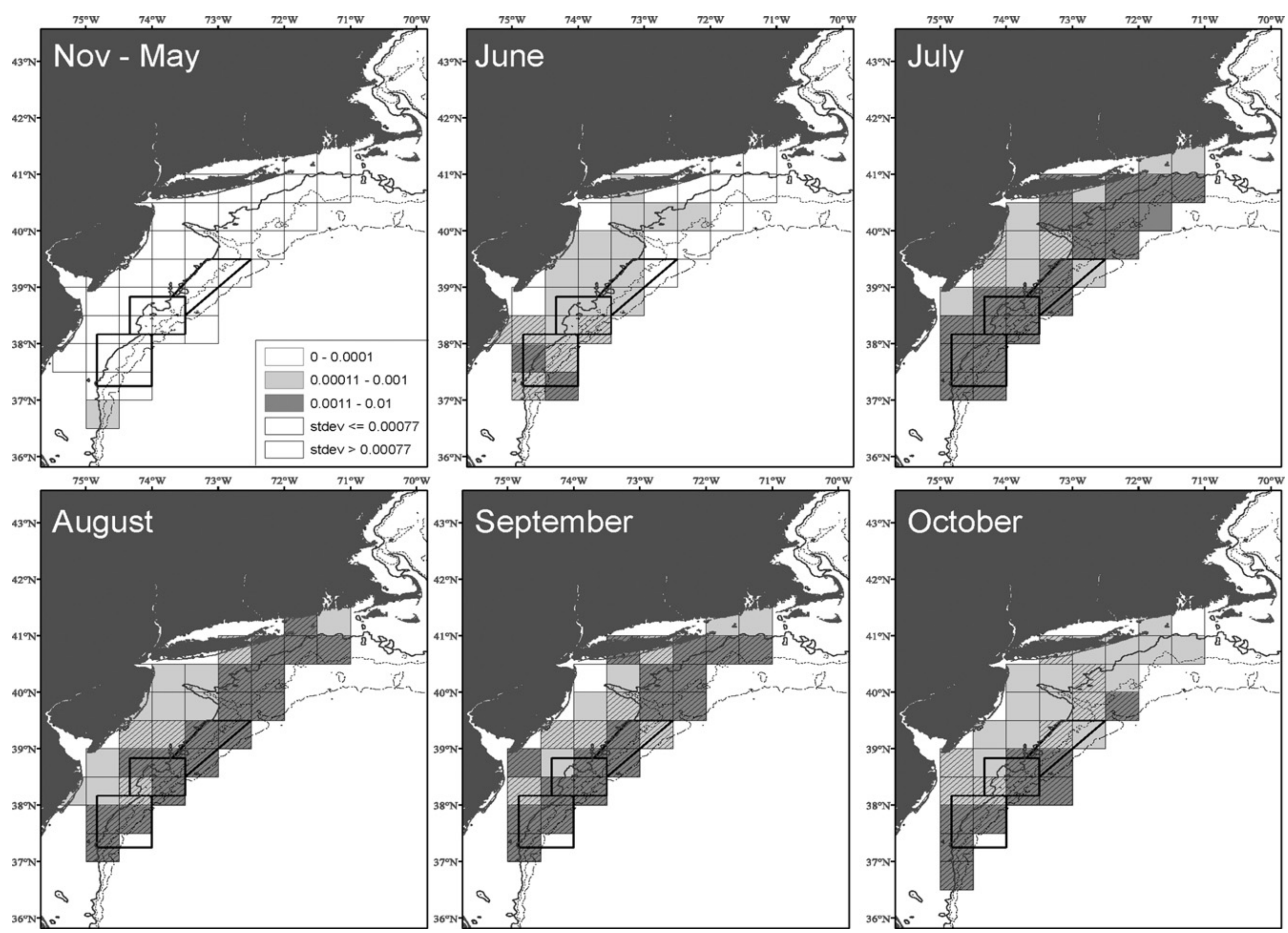

Fig. 7. Distribution over 30' squares of average predicted interaction rates without chain mats on VTR dredge trips, 2001–2008. Squares with fewer than 10 VTR trips have been excluded. The 50 m, 70 m, and 200 m bathymetry lines are shown. From north to south, the Hudson Canyon Access Area, Elephant Trunk, and Delmarva scallop management areas are represented by the black rectangles. Median standard deviation around rates over all months = 0.00077.

Table 4
Average annual estimated interactions of hard-shelled (unidentified and loggerhead species pooled) and loggerhead turtles in the Mid-Atlantic scallop dredge fishery before and after chain mats were required on dredges (CV and 95% Confidence Interval). AE = adult equivalent estimated interactions. A = estimated interactions from dredges without chain mats; B = estimated observed interactions from dredges with or without chain mats; C = estimated observed and unobserved, quantifiable interactions from dredges without chain mats, to estimate the mat's maximum conservation value.

	Time period	Interactions		Interactions	
		Hard-shelled	AE	Loggerhead	AE
A	2001–25 Sept 2006	288 (0.14, 209–363)	49	218 (0.16, 149–282)	37
B	26 Sept 2006–2008	20 (0.48, 3–42)	3	19 (0.52, 2–41)	3
C	26 Sept 2006–2008	125 (0.15, 88–163)	22	95 (0.18, 63–130)	16

actions, plus unobserved, quantifiable interactions, would have been 125 hard-shelled species per year, and 95 loggerheads.

4. Discussion

These results suggest that the estimated rate of observable interactions increases as surface temperatures warm, and are higher around 40–60 m depth. These rates reflect the co-occurrence of sea turtles in the area (Braun-McNeill et al., 2008), the distribution of the scallop resource (Hart and Chute, 2004), and the behavior of turtles and scallop fishers. These broad times and areas suggest that high rates of observable interactions are not localized in space or time within a small area of the Mid-Atlantic. The risk of turtle interactions can be lowered if effort moves out of the Mid-Atlantic from July through October, versus shifting within the Mid-Atlantic during this time period. The Elephant Trunk closure during September and October is well placed as a conservation measure for turtles, so long as the effort does not increase in July or August in the Mid-Atlantic from effort redistributions.

The model unexpectedly predicted high interaction rates during July through September in the northeast region of the Mid-Atlantic, where no turtle interactions were observed. Few commercial dredge trips were observed (<1% observer coverage) in the Mid-Atlantic north of $\sim 40^{\circ}30'$N and west of $\sim 71^{\circ}$W, so the model may perform poorly in this region. If the model predicted zero turtle interactions for trips in this time and area the estimated interactions over all years would change by only $\sim 1\%$, so the degree to which this affected the results was considered to be low. Turtle interactions could occur in this time and area, though more observer coverage is needed to determine whether rates are equivalent to rates farther south.

The percentage of dead turtles captured in dredge gear between 2001 and 2008 (12%) represents a minimum mortality estimate. Several turtles had injuries that may have led to mortalities, though guidelines to determine post-release lethal injuries are still being developed. The National Marine Fisheries Service has been consulting with experts to establish guidelines for assessing injuries to turtles captured in scallop dredge gear. Once these guidelines are established, turtle injuries from interactions with dredge gear can be reassessed to refine mortality rates in the fishery.

These results suggest that an estimated average of 105 turtles per year (125 turtles reduced to 20) were not captured because chain mats were implemented in 2006. Hence, the estimated maximum conservation benefit of the chain mats was 105 turtles per year. If all of these 105 turtles survived the interaction with the chain mat, and would not have survived had they been captured in the bag, then this 84% reduction would be viewed as the conservation benefit of chain mats. There is not enough information in this analysis to evaluate how the chain mat affected the injury and mortality rate of turtles in the gear, though by design the chain mat is intended to reduce injuries resulting from capture in the dredge bag. The realized conservation benefit could be better quantified if mortality and injury rates in traditional gear were refined, and mortality and injury rates in chain mat gear were known. There is no evidence to suggest that the injury rate of a chain mat equipped dredge is higher than that of a traditional dredge.

Reductions in fishing effort during months with high turtle interaction rates (July through October) contributed to the decline in estimated interactions after 2006. An estimated average of 163 turtle interactions per year (288 interactions reduced to 125, or a 57% reduction) were avoided from reductions in fishing effort from the pre-chain mat to post-chain mat period. Since 2006 the Elephant Trunk area was closed to fishing during September and October to protect sea turtles, the Delmarva area was closed to fishing year-round in 2007 and 2008 as part of rotational area management, and the Hudson Canyon Area was closed to fishing in 2008. These closures and other effort reductions tied to rotational area scallop management coincided with times and areas that historically had high turtle interaction rates.

The model developed in this analysis provides a tool to monitor turtle interactions with chain mats. NMFS is required to monitor levels of sea turtle interactions in the scallop fishery. With the use of chain mats preventing the observation of some turtle captures, and in turn preventing the ability to estimate the total number of interactions as had been done prior to chain mat use, the most recent ESA Biological Opinion on the fishery established a surrogate measure for monitoring the Incidental Take Statement (ITS) (NMFS, 2008). The ITS provides an exemption for the anticipated level of take by the fishery, while identifying measures necessary to minimize impacts from the exemption. The Opinion states that NMFS will use dredge hours as the surrogate measure of actual takes; if dredge hours do not exceed the benchmark level, it is presumed the ITS has not been exceeded. This study provides an alternate way to estimate loggerhead interactions in the fishery after 2005.

There are some statistical aspects of the model that should be considered prior to evaluating interactions in future years. First, the chain mat requirement is currently required every year from May to November. With each new year of data, hauls without chain mats will only be from the winter time, and therefore will not represent a random sample. Over the whole time series, hauls without chain mats will be clumped in the early years, and will also become disproportionately smaller in the dataset. In addition, observing and estimating interactions may become more complicated in the future if new modified dredges designed to direct turtles up and over the dredge are used in the fishery (Smolowitz et al., 2010).

In summary, this study offers new information to fisheries managers, the industry, and researchers aiming to reduce or alleviate turtle interactions in the Mid-Atlantic dredge fishery. The distribution of observable interaction rates in the fishery will help managers identify times and areas for further effort reductions if needed. Furthermore, reporting adult equivalent interactions may help managers prioritize conservation actions with limited resources (Wallace et al., 2008). The model developed here represents an alternative approach to monitoring turtle interactions with scallop dredge gear equipped with chain mats. Finally, this study suggests that chain mats and fishing effort reductions contributed to the decline in estimated turtle interactions after 2006.

Acknowledgements

Thanks to Heather Haas, Ron Smolowitz, Carrie Upite, Pat Scida, and Mary Colligan for their valuable review comments, Chris Orphanides for assistance acquiring remotely-sensed SST and chlorophyll data, Bryan Wallace for reproductive value data, and the many fisheries observers who collected data for this analysis.

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Appendix III
Economic Model used in Framework 22

1.0 ESTIMATION OF PRICES, COSTS, PROFITS AND NATIONAL BENEFITS

The economic model includes an ex-vessel price equation, a cost function and a set of equations describing the consumer and producer surpluses. The ex-vessel price equation is used in the simulation of the ex-vessel prices, revenues, and consumer surplus along with the landings and average meat count from biological projections. The cost function is used for projecting harvest costs and thereby for estimating the producer benefits as measured by the producer surplus. The set of equations also includes the definition of the consumer surplus, producer surplus, profits to vessels, and total economic benefits.

1.1 ESTIMATION OF ANNUAL EX-VESSEL PRICES

Fish prices constitute one of the important channels through which fishery management actions affect fishing revenues, vessel profits, consumer surplus, and net economic benefits for the nation. The degree of change in ex-vessel price in response to a change in variables affected by management, i.e., scallop landings and meat count, is estimated by a price model, which also takes into account other important determinants of price, such as disposable income of consumers and price of imports.

Given that there could be many variables that could affect the price of scallops, it is important to identify the objectives in price model selection for the purposes of cost-benefit analyses. These objectives (in addition to developing a price model with sound statistical properties) are as follows:

- To develop a price model that uses inputs of the biological model and available data. Since the biological model projects annual (rather than monthly) landings, the corresponding price model should be estimated in terms of annual values.
- To select a price model that will predict prices within a reasonable range without depending on too many assumptions about the exogenous variables. For example, the import price of scallops from Japan could impact domestic prices differently than the price of Chinese imports, but making this separation in a price model would require prediction about the future import prices from these countries. This in turn would complicate the model and increase the uncertainty regarding the future estimates of domestic scallop prices.

In addition to the changes in size composition and landings of scallops, other determinants of ex-vessel price include level of imports, import price of scallops, disposable income of seafood consumers, and the demand for U.S. scallops by other countries. The main substitutes of sea scallops are the imports from Canada, which are almost identical to the domestic product, and imports from other countries, which are generally smaller in size and less expensive than the domestic scallops. An exception is the Japanese imports, which have a price close to the Canadian imports and could be a close substitute for the domestic scallops as well.

The ex-vessel price model estimated below includes the price, rather than the quantity of imports as an explanatory variable, based on the assumption that the prices of imports are, in general, determined exogenously to the changes in domestic supply. This is equivalent to assuming that the U.S. market conditions have little impact on the import prices. An alternative model would estimate the price of imports according to world supply and demand for scallops, separating the impacts of Canadian and Japanese imports from other imports since U.S. and Canadian markets for scallops, being in proximity, are highly connected and Japanese scallops tend to be larger and closer in quality to the domestic scallops. The usefulness of such a simultaneous equation model is limited for our present purposes, however, since it would be almost impossible to predict how the landings, market demand, and other factors such as fishing costs or regulations in Canada or Japan and in other exporting countries to the U.S. would change in future years.

Since the average import price is equivalent to a weighted average of import prices from all countries weighted by their respective quantities, the import price variable takes into account the change in composition of imports from Canadian scallops to less expensive smaller scallops imported from other countries. This specification also prevents the problem of multi-co-linearity among the explanatory variables, i.e., prices of imports from individual countries and domestic landings. In terms of prediction of future ex-vessel prices, this model only requires assignment of a value for the average price of imports, without assuming anything about the composition of imports, or the prices and the level of imports from individual countries. The economic impact analyses of the fishery management actions usually evaluate the impact on ex-vessel prices by holding the average price of imports constant. The sensitivity of the results affected by declining or increasing import prices could also be examined, however, using the price model presented in this section.

The price model presented below estimates annual average scallop ex-vessel price by market category (PEXMRKT) as a function of

- Meat count (MCOUNT)
- Average price of all scallop imports (PIMPORT)
- Per capita personal disposable income (PCDPI)
- Total annual landings of scallop minus exports (SCLAND-SCEXP)
- Percent share of landings by market category in total landings (PCTLAND)
- A dummy variable as a proxy for price premium for Under 10 count scallops (DU10).

Because the data on scallop landings and revenue by meat count categories were mainly collected since 1998 through the dealers' database, this analysis included the 1999-2008 period. All the price variables were corrected for inflation and expressed in 2008 prices by deflating current levels by the consumer price index (CPI) for food. The ex-vessel prices are estimated in semi-log form to restrict the estimated price to positive values only as follows:

Log (PEXMRKT) = f(MCOUNT, PIMPORT, PCDPI, SCLAND-SCEXP, PCTLAND, DU10)

The coefficients of this model are shown in Table 1. Adjusted R2 indicates that changes in meat count, composition of landings by size of scallops, domestic landings net of exports, average price of all imports, disposable income, and price premium on under 10 count scallops and 2005 dummy variable explain 82 percent of the variation in ex-vessel prices by market category. In contrast to the price model estimates for the earlier years, the coefficient for the landings net of exports was not statistically significant for the period 1999-2008 for the range of landings observed in this period probably because annual variation in landings in recent years were relatively small and the change in the composition of landings toward larger scallops had a larger impact on prices.

In addition, values of the all the explanatory variables are held at the recent levels. For example, disposable income per capita and import prices are assumed to stay constant at the 2008 level. This is because it is not possible to predict accurately the changes in the future values of the explanatory variables and also because our goal is determine the response in prices to the change in landings and the composition in terms of market category given other things held constant. Therefore, future prices could be higher (lower) than predicted depending on the values of the explanatory variables.

Table 1. Regression results for price model

Regression Statistics	
R Square	0.85
Adjusted R Square	0.82
Observations	40

Table 2. Coefficients of the Price Model

Variables	Coefficients	Standard Error	t Stat
INTERCEPT	-1.18096	0.49743	-2.37
MCOUNT	-0.00414	0.00185	-2.23
PIMPORT	0.21944	0.05449	4.03
PCDPI	0.06606	0.01124	5.87
SCLAND-SCEXP	-0.00131	0.00458	-0.29
DU10	0.05008	0.05106	0.98
PCTLAND	-0.23569	0.08327	-2.83

These numerical results should be interpreted with caution, however, since the analysis covers only 10 years of annual data from a period during which the scallop fishery underwent major changes in management policy including area closures, controlled access, and rotational area management.

1.1.1 Estimation of trip costs

1.1.2 Trip Costs

Data for variable costs, i.e., trip expenses include food, fuel, oil, ice, water and supplies. The trip costs per day-at-sea (ffiwospda) is postulated to be a function of vessel crew size (CREW), vessel size in gross tons (GRT), fuel prices (FUELP), and dummy variables for trawl

(TRW) and small dredge (DFT) vessels. This cost equation was assumed to take a double-logarithm form and estimated with data obtained from observer database. The empirical equation presented in Table 3 estimated more than 70% of the variation in trip costs and has proper statistical properties.

Table 3. Estimation of total trip costs per DAS used

The MODEL Procedure

Nonlinear GMM Summary of Residual Errors

Equation	DF Model	DF Error	SSE	MSE	R-Square	Adj R-Sq	Durbin Watson
lnffiwospda	6	206	24.9349	0.1210	0.7159	0.7090	1.8100

Nonlinear GMM Parameter Estimates

Parameter	Estimate	Approx Std Err	t Value	Approx Pr > |t|
intc	3.991271	0.3129	12.76	<.0001
grtco	0.286919	0.0499	5.75	<.0001
crewco	0.632637	0.1411	4.48	<.0001
dftco	-0.27828	0.0794	-3.51	0.0006
trwco	-0.39799	0.1559	-2.55	0.0114
fuelpco	0.84357	0.0846	9.97	<.0001

1.1.3 Estimation of fixed costs

The fixed costs include those expenses that are not usually related to the level of fishing activity or output. These are insurance, maintenance, license, repairs, office expenses, vessel improvement, professional fees, dues, and utility, interest, communication costs, association fees and dock expenses. The data on these items are obtained from the 2006-07 Cost Survey data. The data included 196 observations and the fixed costs are estimated by using the 97 observations for vessels with dredge and trawl gear. Because the data on communications costs and association fees were missing for most observations, these costs were not included in the estimation but their average values for the scallop vessels were added on to fixed costs.

The following model is based on stepwise regression and estimates fixed costs as a function of length, year built, horse power and a dummy variable for boats that have multispecies permit.

Table 4. Basic fixed costs (do not include improvement costs, includes other costs including fuel and maintenance –double entries)

GMM with HCCME=1

The MODEL Procedure

Nonlinear GMM Summary of Residual Errors

Equation	DF Model	DF Error	SSE	MSE	Root MSE	R-Square	Adj R-Sq	Durbin Watson
lnfcbasic	5	92	25.6041	0.2783	0.5275	0.6246	0.6083	2.2879

Nonlinear GMM Parameter Estimates

Parameter	Estimate	Approx Std Err	t Value	Approx Pr > |t|
intc	-300.972	88.0508	-3.42	0.0009
lenco	1.69467	0.2572	6.59	<.0001
bltco	40.13193	11.6098	3.46	0.0008
d10co	-0.44158	0.1346	-3.28	0.0015
hpco	0.145956	0.1503	0.97	0.3341

Number of Observations		Statistics for System	
Used	97	Objective	2.09E-18
Missing	0	Objective*N	2.028E-16

1.1.4 Profits and crew incomes

As it is well known, the net income and profits could be calculated in various ways depending on the accounting conventions applied to gross receipts and costs. The gross profit estimates used in the economic analyses in the FSEIS simply show the difference of gross revenue over variable (including the crew shares) and fixed expenses rather than corresponding to a specific accounting procedure. It is in some ways similar to the net income estimated from cash-flow statements since depreciation charges are not subtracted from income because they are not out-of-pocket expenses.

Gross profits per vessel are estimated as the boat share (after paying crew shares) minus the fixed expenses such as maintenance, repairs and insurance (hull and liability). Based on the input from the scallop industry members and Dan Georgianna on the lay system, the profits and crew incomes are estimated as follows:

- The association fees, communication costs and a captain bonus of 5% are deducted from the gross stock to obtain the net stock.
- Boat share is assumed to be 48% and the crew share is assumed to be 52% of the net stocks.
- Profits are estimated by deducting fixed costs from the boat share.
- Net crew income is estimated by deducting the trip costs from the crew shares.

1.1.5 Consumer surplus

Consumer surplus measures the area below the demand curve and above the equilibrium price. For simplicity, consumer surplus is estimated here by approximating the demand curve between the intercept and the estimated price with a linear line as follows:

CS= (PINT*SCLAN-EXPR*SCLAN)/2

$$PVCS = \sum_{t=2000}^{t=2008} (CS_t / (1+r)^t)$$

Where: r=Discount rate.

CS_t= Consumer surplus at year "t" in 1996 dollars.

PVCS= Present value of the consumer surplus in 1996 dollars.

EXPR= Ex-vessel price corresponding to landings for each policy option.
PINT=Price intercept i.e., estimated price when domestic landings are zero.
SCLAN= Sea scallop landings for each policy option.

Although this method may overestimate consumer surplus slightly, it does not affect the ranking of alternatives in terms of highest consumer benefits or net economic benefits.

1.1.6 Producer surplus

The producer surplus (PS) is defined as the area above the supply curve and the below the price line of the corresponding firm and industry (Just, Hueth & Schmitz (JHS)-1982). The supply curve in the short-run coincides with the short-run MC above the minimum average variable cost (for a competitive industry). This area between price and the supply curve can then be approximated by various methods depending on the shapes of the MC and AVC cost curves. The economic analysis presented in this section used the most straightforward approximation and estimated PS as the excess of total revenue (TR) over the total variable costs (TVC). It was assumed that the number of vessels and the fixed inputs would stay constant over the time period of analysis. In other words, the fixed costs were not deducted from the producer surplus since the producer surplus is equal to profits plus the rent to the fixed inputs. Here fixed costs include various costs associated with a vessel such as depreciation, interest, insurance, half of the repairs (other half was included in the variable costs), office expenses and so on. It is assumed that these costs will not change from one scenario to another.

PS=EXPR*SCLAN- ΣOPC
ΣOPC = Sum of operating costs for the fleet.

$$PVPS = \sum_{t=2000}^{t=2008} (PS_t / (1+r)^t)$$

Where: r=Discount rate.
PS_t= Producer surplus at year "t" in 1996 dollars.
PVPS= Present value of the producer surplus in 1996 dollars.
SCALN= Sea scallop landings for each policy option.

EXPR= Price of scallops at the ex-vessel level corresponding to landings for each policy option in 1996 dollars.

Producer Surplus also equals to sum of rent to vessels and rent to labor. Therefore, rent to vessels can be estimated as:

RENTVES=PS – CREWSH

Rentves= Quasi rent to vessels
Crewsh= Crew Shares

1.1.7 Total economic benefits

Total economic benefits (TOTBEN) is estimated as a sum of producer and consumer surpluses and its value net of status quo is employed to measure the impact of the management alternatives on the national economy.

TOTBEN=PS+CS

Present value of the total benefits= PVTOTBEN= PVPS+PVCS

1.2 REFERENCES

Daniel Georgianna and Debra Shrader (2005); "Employment, Income and Working Conditions in New Bedford's Offshore Fisheries". Final Report for Contract No. NA03NMF4270265, Saltonstall-Kennedy Program, NMFS, June 22, 2005.

Daniel Georgianna, A.Caas and P.Amaral (1999); The Cost of Fishing for Sea Scallops in the Northeastern United States. University of Massachusetts Dartmouth, Cooperative Marine Education and Research Program, NMFS, Contract Number NA67FE0420. December 16, 1999.

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ERRATA TO THE ENVIRONMENTAL ASSESSMENT FOR FRAMEWORK ADJUSTMENT 22 TO THE ATLANTIC SEA SCALLOP FISHERY MANAGEMENT PLAN

April 2011

NOAA's National Marine Fisheries Service, Northeast Region
55 Great Republic Drive
Gloucester, MA 01930-22766

1.0 BACKGROUND AND PURPOSE

The New England Fishery Management Council (Council) submitted Framework Adjustment 22 (Framework 22) to the Atlantic Sea Scallop Fishery Management Plan (FMP) to NOAA's National Marine Fisheries Service (NMFS) on March 23, 2011. Following the submission Framework 22, NMFS has identified additional information which could help clarify discussion regarding recent proposed listings of protected species and the impacts of some alternatives on other fisheries. This errata document provides this additional information to the Environmental Assessment to Framework Adjustment 22 (Framework 22) to the Atlantic Sea Scallop Fishery Management Plan (FMP).

This errata applies to the following sections of Framework 22: 2.2, 4.3, 4.3.1, 4.2.3.1, 5.3, 5.3.8, 5.6.1, 5.6.5, 5.6.7, 5.7.5, 5.7.6, 5.7.8, and 8.0.

2.0 SUMMARY OF THE PROPOSED ACTION

Corresponds to Section 2.1 (Management alternatives under consideration) in the Council's Framework 22 document.

Replace the section number for "Updated allocations for LAGC IFQ vessels (Proposed)" in Table 2 (page 14 of Council's Framework 22 document) with "2.6.2" to reflect the correct section number. Currently, the document states "2.6.1" for both the No Action alternative and the proposed alternative.

4.3 PROTECTED RESOURCES

Corresponds to Section 4.3 (Protected Resources; Page 100) in Council's Framework 22 document.

Insert the following text at the end of the list of protected species found in the environment in which the sea scallop fishery is prosecuted.

"**Proposed Species for Listing**	**Proposed Status**
Atlantic sturgeon *(Acipenser oxyrinchus oxyrinchus)*	Endangered/Threatened
Loggerhead sea turtle *(Caretta caretta)*	Endangered*

* Proposed up-listing from threatened, which is the current status under ESA."

4.3.1 Proposed, Threatened, and Endangered Species Not Likely to be affected by the Alternatives under Consideration

Corresponds to Section 4.3.1 (Threatened and Endangered Species Not Likely to be affected by the Alternatives under Consideration; Page 101 of Framework 22 document).

Insert the following text at the end of the discussion of threatened and endangered species not likely to be affected by the Framework 22 Alternatives under Consideration.

“Atlantic Sturgeon (Proposed for Listing)
Atlantic sturgeon have been proposed for listing under the ESA (75 FR 61872 and 75 FR 61904; October 6, 2010). NMFS has concluded that the U.S. Atlantic sturgeon spawning populations comprise five Distinct Population Segments (DPSs) (ASSRT, 2007). The Gulf of Maine DPS of Atlantic sturgeon is proposed to be listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon are proposed as endangered. Atlantic sturgeon of each of the five DPSs occur where the scallop fishery operates.

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). Information on population sizes for each Atlantic sturgeon DPS is very limited.

Based on the best available information, NMFS has concluded that incidental catch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon. Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for caught sturgeon (ASMFC TC 2007). Scallop dredge and trawl gear are not known to pose a risk for Atlantic sturgeon despite many hours of observer coverage for these gear types. In fact, according to the NMFS Observer database, there are no reports of Atlantic sturgeon captures in scallop dredge or trawl gear from 2001 through 2010 (NEFSC 2011, Stein et al. 2004a, ASMFC TC 2007). Because the scallop fishery predominantly uses dredge gear, this species is not likely to be affected by the operation of the scallop fishery. Final determinations on the proposed listings are expected by October 6, 2011.”

4.3.2.1 Sea Turtle Background

Corresponds to Section 4.3.2.1 (Sea Turtle Background; Page 105 of Framework 22 document).

Replace the last two paragraphs of the loggerhead sea turtles discussion with the following:

"As mentioned in Section 4.3.2.1, the Services published a proposed rule to designate nine loggerhead DPSs worldwide, with seven as endangered and two as threatened, on March 16, 2010 and the timeline for the final determination was extended for six months until September 16, 2011 (76 FR 15932).

ESA Section 7 consultations are required when a proposed action may affect listed species; however, a conference is required only when the proposed action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. Therefore, a conference would be required if it were determined that the scallop fishery, including implementation of Framework 22, was likely to jeopardize one or more of the proposed nine DPSs of loggerhead sea turtles. The effects of the scallop fishery on loggerhead sea turtles was conducted in the March 14, 2008, Biological Opinion. That Biological Opinion concluded that the scallop fishery may affect, but was not likely to jeopardize, loggerhead sea turtles. An incidental take statement and associated reasonable and prudent measures (RPMs) and terms and conditions (T/Cs) were included with that Biological Opinion. In reaching that conclusion, the Biological Opinion considered the effect of the estimated take on nesting beach aggregations and ultimately to the global species as listed. The difference between the analysis contained in the 2008 Biological Opinion and that conducted for the proposed species would be that it was conducted at the level of the global species and it was conducted for a species listed as threatened whereas the proposal is for nine DPSs, two of which are proposed to be listed as threatened and seven to be listed as endangered. The Northwest Atlantic DPS is the one affected the most by the scallop fishery, and it is proposed to be listed as endangered. It is important to note that the effects analysis was conducted by examining the estimated number of takes against what is known about the biological status of loggerhead sea turtles and did not explicitly include any specific variable that would be affected by the listing status (*e.g.*, threatened or endangered). Since the 2008 Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not likely change the conclusion of that Biological Opinion.

Regardless of the proposed up-listing of the Northwest Atlantic DPS, the Council and NMFS must still adhere to the current RPMs and T/Cs of the most recent Biological Opinion."

5.3 IMPACTS ON PROTECTED RESOURCES

Corresponds to Section 5.3 (Impact on Protected Resources) of the Council's Framework 22 document).

5.3.8 Alternatives to minimize impacts of incidental take of sea turtles as per the 2008 scallop biological opinion

Corresponds to Section 5.3.8 (Alternatives to minimize impacts of incidental take of sea turtles as per the 2008 scallop biological opinion) of the Council's Framework 22 document).

Insert the following paragraph at the beginning of this Section (page 201):

"As mentioned in Section 4.3.2.1, the Services' proposed rule to designate nine loggerhead DPSs worldwide, with seven as endangered and two as threatened, would not change the conclusion of the 2008 Biological Opinion of the sea scallop fishery. Therefore, the Council and NMFS must still adhere to the current RPMs and T/Cs of the most recent Biological Opinion. Since the 2008 Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not likely change the conclusion of that Biological Opinion. The proposed up-listing of loggerhead sea turtles does not currently impact anything the Council and NMFS are required to do for FW22 with regards to adhering to the current RPMs and T/Cs of the most recent Biological Opinion."

5.6.1 ACCEPTABLE BIOLOGICAL CATCH (ABC)

Corresponds to Section 5.6.1 (ABC; Page 276 of the Council's Framework 22 document).

This information replaces the text in Section 5.6.1 to read as follows:

"There are not expected to be any additional impacts on other fisheries as a result of setting ABC values in the scallop fishery as proposed (60.1 M lb in fishing year (FY) 2011 63.8 M lb in FY 2012). These proposed ABC values are similar to the No Action ABC alternative (57.8 M lb for both FYs). The scallop fishery's ABC, defined as the maximum catch that is recommended for harvest, is part of the process of establishing the annual catch limits (ACLs) for the scallop fishery. Buffers for management uncertainty are applied to the ABC to further reduce the total scallop landings allocated to this fishery. For fish species known to be caught while on dedicated scallop trips, such as yellowtail flounder, separate ACLs have been allocated to the scallop fishery through the Northeast Multispecies FMP. Amendment 15 to the FMP only considers accountability measures (AMs) for non-target species that have been identified by the primary FMP that manages a particular species, and yellowtail flounder is the only species that has currently been identified. Because the impact of scallop landings for yellowtail flounder has already been considered and accounted for in the Northeast Multispecies FMP, and because no other fisheries' FMPs have identified a need for a sub-ACL in the scallop fishery, the two scallop ABC alternatives are not expected to have any additional impacts on other fisheries."

5.6.5 Modify the in-shell possession limit for Limited Access General Category (LAGC) vessels seaward of the VMS demarcation line

Corresponds to Section 5.6.5 (Modify the in-shell possession limit for LAGC vessels seaward of the VMS demarcation line; Page 277 of the Council's Framework 22 document).

This information replaces the text in Section 5.6.5 to read as follows:

"The No Action (proposed) alternative will keep the in-shell possession limit at 100 bu of scallops. Currently, LAGC scallop vessels are able to possess 100 bu of scallops seaward of the VMS line but may not possess more than 50 bu when shoreward of the VMS demarcation line. The only other alternative considered was to reduce this seaward possession limit due to enforcement concerns that LAGC vessels were buoying 50 bu of scallops seaward of the VMS line to retrieve and land them the next day. Because this was an enforcement-related issue focusing on possessing scallops onboard a vessel, neither of the alternatives considered are expected to have direct impacts on other fisheries."

5.6.7 Eliminate reference to Georges Bank (GB) access area schedule in regulations
Corresponds to Section 5.6.7 (Eliminate reference to GB access area schedule in regulations; Page 277 of the Council's Framework 22 document).

This information replaces the text in Section 5.6.7 to read as follows:

"The two alternatives considered by the Council were the No Action alternative (keep the current one year closed/two years open schedule) or to remove this schedule so that the access area schedule would be based solely on scallop biomass projections and set in biennial framework adjustments (proposed alternative). The proposed alternative is merely allowing the access area schedules to be set as they have in previous years but relieves the unnecessary confusion that has resulted due to the late implementation of frameworks. These alternatives are not expected to have direct impacts on fisheries because they are administrative in nature."

5.7.5 Past and Present actions – Protected Species
Corresponds to Section 5.7.5 (Past and Present actions) of the Council's Framework 22 document).

Insert the following paragraphs at the end of the protected species discussion on page 289:

"As mentioned in Section 4.3.2.1, the Services' proposed rule to designate nine loggerhead DPSs worldwide, with seven as endangered and two as threatened, would not change the conclusion of the 2008 Biological Opinion of the sea scallop fishery. Therefore, the Council and NMFS must still adhere to the current RPMs and T/Cs of the most recent Biological Opinion. Since the 2008 Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not likely change the conclusion of that Biological Opinion. The proposed up-listing of loggerhead sea turtles does not currently impact anything the Council and NMFS are required to do for FW22 with regards to adhering to the current RPMs and T/Cs of the most recent Biological Opinion."

5.7.6 Reasonably Foreseeable Future Actions – Protected Species

Corresponds to Section 5.7.6 (Reasonably Foreseeable Future Actions) of the Council's Framework 22 document).

Insert the following text at the end of this Section (page 302):

"As mentioned in Section 4.3.2.1, the Services' proposed rule to designate nine loggerhead DPSs worldwide, with seven as endangered and two as threatened, would not change the conclusion of the 2008 Biological Opinion of the sea scallop fishery. Therefore, the Council and NMFS must still adhere to the current RPMs and T/Cs of the most recent Biological Opinion. Since the 2008 Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not likely change the conclusion of that Biological Opinion. The proposed up-listing of loggerhead sea turtles does not currently impact anything the Council and NMFS are required to do for FW22 with regards to adhering to the current RPMs and T/Cs of the most recent Biological Opinion."

5.7.8 Cumulative Effects Analysis – Protected Species

Corresponds to Section 5.7.8 (Cumulative Effects Analysis – Summary of cumulative effects on protected resources) of the Council's Framework 22 document).

Insert the following text before the last sentence of the second paragraph of this Section (page 313):

"If the final determination of NMFS is to up-list the loggerhead sea turtle to Endangered status for the Northwest Atlantic Ocean DPS, Section 7 consultation under ESA will be reinitiated on the sea scallop fishery. Since the March 14, 2008, Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not likely change the conclusion of that Biological Opinion."

8.0 LITERATURE CITED

Corresponds to Section 8.0 (Literature Cited; Page 370 of the Council's Framework 22 document).

Insert the following citations to Section 8.0 of the Council's Framework 22 document:

"ASMFC TC (Atlantic States Marine Fisheries Commission Technical Committee). 2007. Special Report to the Atlantic Sturgeon Management Board: Estimation of Atlantic sturgeon bycatch in coastal Atlantic commercial fisheries of New England and the Mid-Atlantic. August 2007. 95 pp.

ASSRT (Atlantic Sturgeon Status Review Team). 2007. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). National Marine Fisheries Service. February 23, 2007. 188 pp.

Dadswell, M. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. Fisheries 31: 218-229.

Dovel, W. L. and T. J. Berggren. 1983. Atlantic sturgeon of the Hudson River estuary, New York. New York Fish and Game Journal 30: 140-172.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus*) within the Northwest Atlantic Ocean determined from five fishery-independent surveys. Fish. Bull. 108:450-465.

Holland, B.F., Jr., and G.F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. Division of Commercial and Sports Fisheries, North Carolina Dept. of Natural and Economic Resources, Special Scientific Report No. 24. 130pp.

Kynard, B. and M. Horgan. 2002. Ontogenetic behavior and migration of Atlantic sturgeon, *Acipenser oxyrinchus oxyrinchus*, and shortnose sturgeon, *A. brevirostrum*, with notes on social behavior. Environmental Behavior of Fishes 63: 137-150.

Laney, R.W., J.E. Hightower, B.R. Versak, M.F. Mangold, W.W. Cole Jr., and S.E. Winslow. 2007. Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988-2006. *In* Anadromous sturgeons: habitats, threats, and management (J. Munro, D. Hatin, J.E. Hightower, K. McKown, K.J. Sulak, A.W. Kahnle, and F. Caron (eds.)), p. 167-182. Am. Fish. Soc. Symp. 56, Bethesda, MD.

New England Fisheries Science Center (NEFSC). 2011. Standard Bycatch Reporting Methodology Annual Discard Report 2010, Section 2.

Stein, A. B., K. D. Friedland, and M. Sutherland. 2004a. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. North American Journal of Fisheries Management 24: 171-183.

Stein, A.B., K. D. Friedland, and M. Sutherland. 2004b. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. Transaction of the American Fisheries Society 133:527-537.

Waldman, J. R., J. T. Hart, and I. I. Wirgin. 1996. Stock composition of the New York Bight Atlantic sturgeon fishery based on analysis of mitochondrial DNA. Transactions of the American Fisheries Society 125: 364-371."