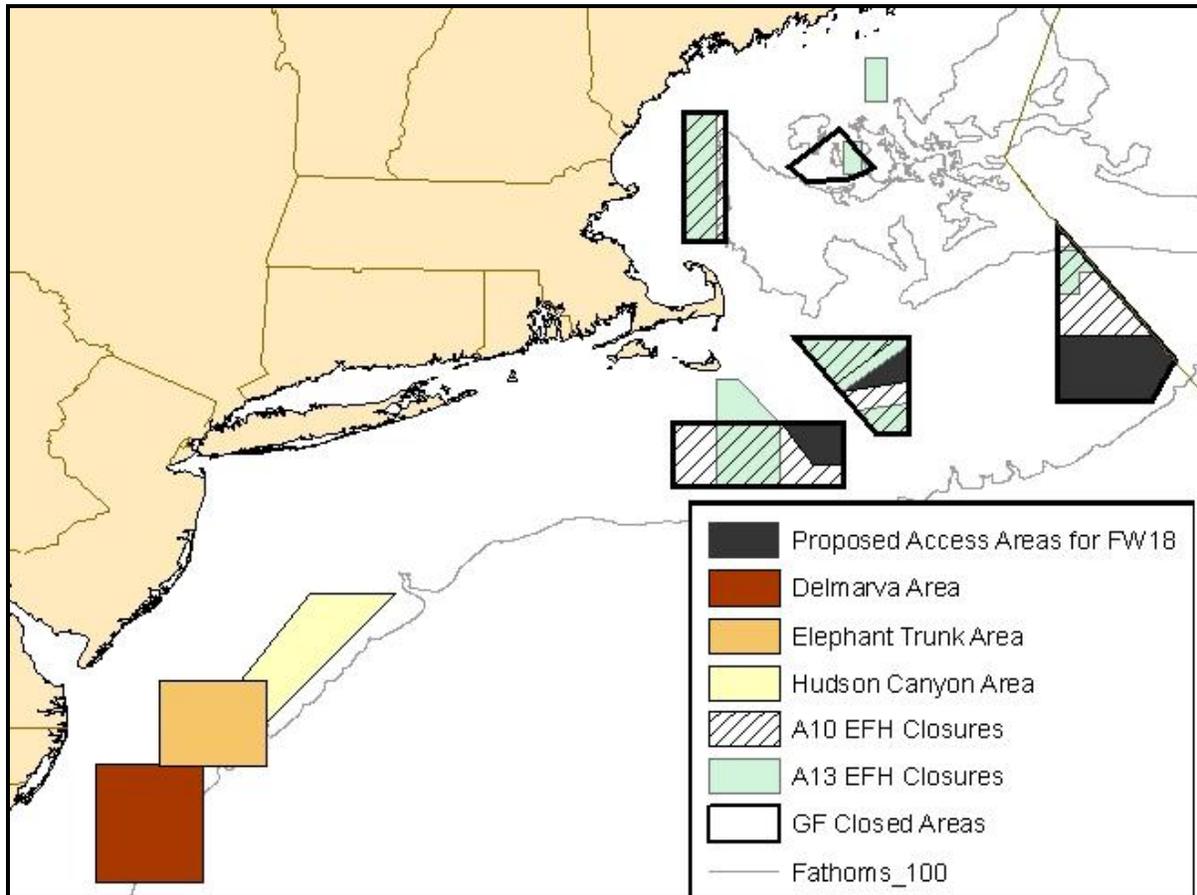


Framework Adjustment 18 to the Atlantic Sea Scallop FMP

Including an
Environmental Assessment, Regulatory Impact Review, 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

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Executive Summary

The New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Act. The Scallop Fishery Management Plan (FMP) specifies the management measures for the sea scallop resource in the Northeast. The FMP was implemented in 1982 and overtime has been amended through various amendments and framework adjustments. In 2004, Amendment 10 introduced rotation area management and changed the way the FMP allocates fishing effort for limited access scallop vessels. Instead of allocating an annual pool of days-at-sea (DAS) for limited access vessels to fish in any area, vessels now have to use a portion of their total DAS allocation in controlled access areas defined by the plan, or exchange them with another vessel to fish in a different controlled access area. Vessels are also allocated a specific number of open area DAS that can be fished in areas that are not designated as controlled access areas or closed areas.

Framework 16 to the Scallop Plan was the last framework action that proposed management measures to control scallop fishing effort in re-opened portions of the Georges Bank groundfish closed areas (controlled access areas). Framework 16 implemented measures for fishing years 2004 and 2005. The primary purpose of this action (Framework 18) is to set specifications for the 2006 and 2007 fishing years. The alternatives under consideration would change the order of rotation and the fishing mortality targets for the Georges Bank controlled access areas. This action is also considering a number of other measures to prevent overfishing and improve yield-per-recruit through area rotation adjustments, reduce administrative burdens and risks to safety at sea, as well as measures to address sea turtle interactions with scallop fishing gear.

Proposed Action

Area specific limits on fishing by limited access vessels

The Council considered area specific allocation of total pounds per vessel with no trip possession limit for controlled access areas, but determined that action may be premature. Instead, the status quo alternative for area specific limits will remain in place. The proposed action would continue the current regulations that authorize limited access vessels to take a limited number of trips in each controlled access area with a scallop possession limit for each trip. Each access area trip made by a full-time vessel may land up to 18,000 pounds of scallop meats. Part-time vessel may land 40% of the full-time amount and occasional vessels may land 1/12th of the full-time amount.

Georges Bank Area Access Measures

- *Revise the Georges Bank area access schedule*

Parts of the multispecies closed areas on Georges Bank have been periodically opened for controlled scallop fishing since 1999. This action considered modifications to the access schedule, with no changes in boundaries. Based on the Scallop Plan Development Team (PDT) recommendations, the Council selected the “Contingency Alternative” as the proposed action. Under this alternative, five Georges Bank access trips would be allocated in 2006 with the Closed Area I access trip reassigned to Closed Area II. In 2007, two access trips would be allocated (one in Closed Area I and one in Nantucket Lightship). Tables 13-15 show the specifications for the proposed action.

- *Adjustments when YT Flounder catches reach the 10% TAC limit)*

Under current regulations, if the 10% yellowtail flounder TAC is reached and Georges Bank access areas close, vessels that have not taken trips are authorized to take up to two unused trips in the

open fishing areas, but the regulations are silent about 2007. The Council proposes to allocate additional open area DAS for each trip not taken before areas close, but at a prorated value of DAS. Upon an area closure, each vessel with unused trips would be allocated a specific amount of additional open area DAS, based on this pre-defined ratio.

Hudson Canyon Area Rotation Measures

The Hudson Canyon area was initially closed in 1998 to protect a strong year class of young scallops. New data indicates that scallop biomass in the Hudson Canyon area in 2005 is much less than had been predicted by Amendment 10 from 2003 survey results. Catch rates dropped quicker than had been anticipated, and many vessels took sub-optimal trips in 2005 or chose to delay taking their 2005 access trips. The proposed action would extend the duration of the Hudson Canyon area access program until February 28, 2008 when the area would be open as a regular scallop fishing area.

Elephant Trunk Area (ETA) Rotation Measures

Amendment 10 closed the ETA to scallop fishing in July 2004 to protect two very strong year classes and anticipated that the scallops would reach optimum size for harvest in 2007. Framework 18 considered several alternatives for managing this access area when it re-opens including how many trips should be allocated, when the area should open and whether or not the area should be closed seasonally to reduce the risk of interactions with sea turtles and reduce scallop and finfish discard mortality.

- *Initial trip allocations*

The Council selected precautionary initial trip allocations and set-asides to achieve a fishing mortality target of 0.16, as compared to 0.32 under the status quo. The proposed action allocates five trips for full-time vessels and a proportionate amount for part-time and occasional vessels.

- *Re-opening date*

The Council determined that the Elephant Trunk Area should re-open early on January 1, 2007, rather than on March 1, 2007 as planned under Amendment 10.

- *Seasonal closure to potentially reduce sea turtle interactions in the Elephant Trunk Area and reduce scallop and finfish discard mortality*

During the 2007 fishing year, the ETA would be closed to scallop fishing for a two month period (September 1 - October 31) to possibly reduce sea turtle interactions. This alternative would close the redefined ETA when the majority of turtle catches were observed over the last two years, and minimize the potential economic impacts of a longer closure.

Procedures to adjust ETA allocations to account for uncertainty in 2007 ETA biomass estimates

The Council approved a rulemaking process that would allow the Regional Administrator to adjust allocations in the ETA based on updated biomass projections. The proposed action would allow adjustments to be made more quickly to ensure that the ETA allocations do not cause overharvesting. If biomass estimates are lower than projected, the number of access trips can be reduced quickly using event-triggered rulemaking.

Delmarva Area Rotation Closure

High numbers of small scallops from the 2003 year class were observed by the 2005 survey in many stations in the proposed Delmarva rotation area. Under the proposed action, the area would close in 2007 when the Elephant Trunk area opens (January 1, 2007). The Delmarva area would remain closed for three years until February 28, 2010 when the small scallops have grown sufficiently to be harvested.

Open Area Management

The open area DAS allocations are set annually and adjusted every two years to achieve optimum yield at the target fishing mortality ($F=0.2$) for the total scallop resource. Since the formula also includes the mortality in controlled access areas, the open area DAS allocations depend on what controlled access area management TACs are approved. The Council considered ten options with different combinations of GB access areas, access into ETA, access into Hudson Canyon, and whether or not the Delmarva area would be closed in 2007. Based on the rotation area management decisions the Council made, their recommendation for open area DAS is 20,000 open area DAS. The specifications associated with 20,000 open area DAS translates based on the number of permits issued into 52 DAS for full-time vessels in 2006 and 51 DAS in 2007. Part-time vessels would be allocated 21 DAS in 2006 and 20 DAS in 2007, and occasional vessels would receive 4 DAS for both years.

Limited Access Crew Limits

The Council proposes to eliminate the 7 person crew limit (5 for small dredge vessels) on controlled access area trips. Under the proposed action, limited access vessels on a controlled access area trip would have no limit on the number of crew onboard. This action is intended to eliminate fishing costs caused by the crew limit measure.

Trip Exchange Deadline

The proposed action would allow vessels to exchange controlled access area trip allocations at any time during the fishing year, with proper notification and approval by NMFS. Amendment 10 required that transactions be completed within 90 days of when allocations were made, but this restriction was found to be unnecessary for adequate monitoring and compliance. Therefore, the Council proposes to eliminate the June 1 deadline.

Controlled Access Area Trip Exchanges

The proposed action includes three measures to liberalize the trip exchange program: 1) one-to-one exchanges of 2006 GB access area trips and 2007 ETA trips; 2) one-to-one exchanges of GB access trips and unused 2005 Hudson Canyon area trips to be used in 2006; and 3) the Status Quo alternative - one-to-one exchanges of controlled access area trips for areas open to fishing during the same fishing year. Without the proposed action, Mid-Atlantic vessels would not be able to gain a Mid-Atlantic controlled access area trip in exchange for a Georges Bank controlled access area trip; because no Mid-Atlantic controlled access areas would be open to fishing.

Broken Trip Exemption Program

The broken trip exemption program allows vessels that return to port on a controlled access area trip to catch the remaining portion at a later date on a compensation trip. The Council recommends a 60-day carry forward provision to reduce business and safety risks. The Council did approve an additional reporting requirement for broken trips. The addition would establish an identification number for each compensation trip issued in response to a broken trip.

Considered and Rejected Alternatives

The Council considered and rejected a number of alternatives to address effort in the general category fleet, aspects of both the Hudson Canyon and Elephant Trunk Areas, additional aspects of trip exchanges, and modifications to the research set-aside program. These measures are described in Section 3.4. The Council has decided to initiate work on two Amendments in the near future; Amendment 11 to address the general category fleet, and Amendment 12 will be an omnibus amendment to all plans in the region to address standardized bycatch reporting methodologies.

Summary of Environmental Consequences

The Environmental Consequences of the proposed action, and the alternatives to the proposed action are described in Section 5.0. In describing the impacts of this action, this document assessed five valued ecosystem components (VECs). The biological impacts on the *sea scallop resource* are described in Section 5.1.1. The biological impacts on *non-target species* (bycatch) are described in Section 5.1.2. The impacts on *protected and endangered species* are described in Section 5.1.3, and the impacts on *essential fish habitat* are in Section 5.1.4. Lastly, the impacts on the *human environment* are described in Section 5.2 (Section 5.2.1 describes the economic impacts and Section 5.2.2 summarizes the social impacts).

Table 1 has been created to assist the reader in finding relevant sections in the framework document that describe and analyze the proposed action. It includes the specific sections that describe each measure in Section 3.0 with the analysis of impacts in Section 5.0. In addition, the Council used a decision document at the final Council meeting that summarized the alternatives under considerations as well as the impacts of each measure. This document has been attached to the framework document (Attachment A).

Table 1 – Cross reference of sections that describe and analyze the proposed action

Decision Number from Decision Document(1)	Title of Action	Description of Action (Section 3.0)	Environmental Consequences by VEC (Section 5.0)					
			Biological Environment (Section 5.1)				Human Environment (Section 5.2 and 5.3)	
			Sea Scallop Resource (5.1.1)	Non-target Species (5.1.2)	Protected Species (5.1.3)	Essential Fish Habitat (5.1.4)	Economic Impacts (5.2)	Social Impacts (5.3)
1	Area Specific Limits	3.3.1.1.2	5.1.1.1	5.1.2.1	5.1.3.1	5.1.4.1	5.2.2.1	5.3.1
2 A	GB access schedule	3.3.1.2.3	5.1.1.2.5	5.1.2.2	5.1.3.2	5.1.4.2.1	5.2.1,5.2.2.2	5.3.2
2B	YT flounder adjustments	3.3.1.2.4	5.1.1.2.5	5.1.2.2.3	5.1.3.2.1	5.1.4.2.2	5.2.2.3	5.3.2
3	Hudson Canyon rotation	3.3.1.3.1	5.1.1.2.6	5.1.2.2	5.1.3.3	5.1.4.3	5.2.1,5.2.2.4	5.3.3
4A	ETA initial allocation	3.3.1.4.1.1	5.1.1.2.7	5.1.2.2	5.1.3.4.1	5.1.4.4.1	5.2.1,5.2.2.5.1	5.3.4
4B	ETA re-opening date	3.3.1.4.2.1	5.1.1.2.7	5.1.2.2	5.1.3.4.2	5.1.4.4.2	5.2.2.5.2	5.3.4
4C	ETA seasonal closure	3.3.1.4.3.3	5.1.1.2.7	5.1.2.2.2	5.1.3.4.3	5.1.4.4.3	5.2.2.5.3	5.3.4
5	Procedures to adjust ETA	3.3.1.5.1	5.1.1.2.8	5.1.2.2	5.1.3.5	5.1.4.5	5.2.2.6	5.3.4.1
6	Delmarva area rotation	3.3.1.6.1	5.1.1.2.9	5.1.2.2	5.1.3.6	5.1.4.6	5.2.2.7	5.3.5
7	Open area management	3.3.2	5.1.1.3	5.1.2.3	5.3.1.7	5.1.4.7	5.2.1,5.2.3	5.3.6
8	Limited access crew limits	3.3.3.1	5.1.1.4	5.1.2.4	5.1.3.8	5.1.4.8	5.2.4	5.3.7
9	Trip Exchange Deadline	3.3.4.1	5.1.1.5	5.1.2.5	5.1.3.9	5.1.4.9	5.2.5.1	5.3.8
10	Cont. access trip exchange	3.3.5	5.1.1.5	5.1.2.5	5.1.3.9	5.1.4.10	5.2.5.2-5.2.5.5	5.3.9
11	Broken Trip exemption	3.3.6.1	5.1.1.5	5.1.2.6	5.1.3.9	5.1.4.11	5.2.5.6	5.3.10

1 The decisions numbers refer to the Decision Document that was used at the Final Council meeting (November 17, 2005). The Decision Document has been attached to this document (Attachment A).

Impacts on the sea scallop resource

Most measures in the proposed action have positive effects on the scallop resource. This action proposes measures to improve the overall performance of the rotational area program, having positive long-term impacts on the resource. Closing the Delmarva Area is expected to have positive effects because this measure will protect small scallops, and therefore improve overall yield from the resource in the long-term. Likewise, measures to allocate effort in the Elephant Trunk Area will have positive cumulative effects. Limiting open area effort to 20,000 DAS is expected to keep overall fishing mortality low and improve yield-per-recruit. One measure that may have some negative cumulative effects on the scallop resource is eliminating the crew limit for controlled access area trips, only if it enables vessels to land smaller scallops and, as a result, catch rates in the area decline.

Impacts on non-target species

In general, all the measures included in the proposed action have positive or neutral impacts on non-target species. Many of the measures proposed in this action concentrate fishing effort in areas with high scallop catch per-unit-of-effort, which reduces fishing time and bycatch. 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. Several measures in this action are proposed to limit derby-style fishing which can lead to higher levels of bycatch. Limiting open area DAS to 20,000 will keep scallop biomass at target levels and maintains relatively high scallop landings-per-unit-of-effort (LPUE). This keeps vessels from fishing long durations in marginal areas, where bycatch can be higher than normal.

Impacts on protected and endangered species

The proposed action is not expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species. This action also includes a measure specifically designed to reduce potential interactions with scallop gear and sea turtles in the Mid-Atlantic (seasonal closure for fishing in the ETA from September 1 to October 31). Limiting and controlling scallop fishing effort in Mid-Atlantic areas where sea turtle interactions with the scallop fishery are known to have occurred is expected to help reduce the likelihood of further interactions in those areas. Overall, there is no information at this time to suggest that interactions between sea turtles and scallop fishing gear will increase as a result of the measures proposed in this action.

Impacts on essential fish habitat

The effects of this action on habitat are expected to be minimal. Amendment 10 to the Atlantic Sea Scallop FMP and Amendment 13 to the Northeast Multispecies FMP adopted a suite of measures that minimized, to the extent practicable, the adverse effects of fishing on EFH from gears used in the scallop fishery. These measures included areas restricted to all bottom-tending mobile gear, gear modifications and benefits that accrue from the effort reductions and other provisions of the amendments. While this action proposes access into portions of the Groundfish mortality closed areas, it is important to note that none of the measures allow for access to the Habitat Closed Areas established by either Amendment 10 to the Atlantic Sea Scallop FMP or Amendment 13 to the Northeast Multispecies FMP. Therefore, adverse impacts to EFH will continue to be minimized.

Impacts on the human environment

Overall, the majority of measures proposed in this action are designed to make rotational area management more flexible, which improves the overall performance of the program, and has positive

long-term impacts on the resource and fishery. Therefore, most of the measures in the proposed action have positive effects (economic and social impacts) on the human environment. Area rotation and controlled access area management had positive economic and social impacts in the past and the revised access schedule for Georges Bank will augment these positive impacts by allocating more access trips consistently over the years. All the measures related to rotational management (Closing the Delmarva area, ETA management and the Hudson Canyon Area) will have some potentially negative and some positive economic impacts; however, the overall impacts on the human environment from this action are expected to be positive.

Cumulative Effects

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 adverse impact. In general, this action proposes modifications to the rotational area management program. For the most part, these modifications increase flexibility and performance of the management program and have positive impacts on the resource and fishery.

This framework adjustment was prepared by the New England Fishery Management Councils, in consultation with NMFS and the Mid-Atlantic Fishery Management Council. Framework 18 also serves as the 2005 Stock Assessment and Fishery Evaluation (SAFE) Report as required by the scallop regulations. The SAFE Report is in Section 4.0 of this document and includes several Appendices, which are attached to this document.

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1.0 Table of Contents

1.0	Table of Contents	1-1
1.1	List of Tables	1-7
1.2	List of Figures	1-12
1.3	List of Maps	1-13
1.4	List of Acronyms	1-14
2.0	INTRODUCTION AND BACKGROUND.....	2-1
2.1	Purpose and Need for Action	2-1
2.2	Background	2-2
2.2.1	Scallop management	2-2
2.2.2	Setting specifications	2-4
2.2.3	Area rotation management	2-5
2.2.4	Reducing administrative burdens and risks to safety	2-6
2.2.5	Minimize interactions with sea turtles	2-7
2.2.6	Other issues not in this action	2-7
2.2.6.1	Measures for the general category fishery.....	2-7
2.2.6.2	Standardized bycatch reporting methodology (SBRM)	2-8
3.0	MANAGEMENT ALTERNATIVES.....	3-1
3.1	Summary of the Proposed Action	3-1
3.1.1	Area specific limits on fishing by limited access vessels.....	3-1
3.1.2	Georges Bank area access measures	3-1
3.1.2.1	Revise the Georges Bank area access schedule.....	3-1
3.1.2.2	Adjustments when yellowtail flounder catches reach 10% TAC limit.....	3-2
3.1.3	Hudson Canyon area (HCA) rotation measures	3-2
3.1.4	Elephant Trunk Area (ETA) rotation measures	3-3
3.1.4.1	Initial trip allocations.....	3-3
3.1.4.2	Re-opening date.....	3-4
3.1.4.3	Seasonal closure to potentially reduce sea turtle interactions in the Elephant Trunk Area	3-4
3.1.5	Procedures to adjust ETA allocations to account for uncertainty in 2007 ETA biomass estimated.....	3-4
3.1.6	Delmarva (DMV) area rotation closure	3-5
3.1.7	Open area management.....	3-5
3.1.8	Limited access crew limits	3-6
3.1.9	Trip exchange deadline	3-6
3.1.10	Controlled access area trip exchanges	3-7
3.1.11	Broken trip exemption program.....	3-8
3.2	Comparison of Alternatives with No Action and Status Quo	3-9
3.2.1	No Action	3-9
3.2.2	Status Quo	3-9
3.2.3	Comparison of Alternatives considered in Framework 18 with No Action and Status Quo..	3-10
3.2.4	Measures that will be in effect March 1, 2006 until Framework 18 is Implemented.....	Error!
	Bookmark not defined.	
3.3	Description of Non-selected Alternatives Considered and Analyzed, as well as the Proposed Action	3-12
3.3.1	Area Rotation Measures and Allocations.....	3-15
3.3.1.1	Area specific limits on fishing by limited access vessels.....	3-19
3.3.1.2	Georges Bank Area Access Measures	3-23

3.3.1.3	Hudson Canyon Area Rotation Measures	3-35
3.3.1.4	Elephant Trunk Area (ETA) Rotation Measures	3-38
3.3.1.5	Procedures to adjust Elephant Trunk Area (ETA) allocations to account for uncertainty in 2007 Elephant Trunk Area biomass estimates	3-44
3.3.1.6	Delmarva Area Rotation Closure	3-46
3.3.2	Open Area Management.....	3-49
3.3.2.1	DAS Allocations.....	3-49
3.3.2.2	DAS set-aside for observers (1%) and research (2%) and assumptions for catches by the general category fleet	3-52
3.3.2.3	DAS administration and monitoring.....	3-53
3.3.3	Limited access crew limits	3-54
3.3.3.1	Preferred alternative: Eliminate the 7 person crew limit (5 persons on small dredge vessels) for vessels on controlled access area trips (proposed action).....	3-54
3.3.3.2	Raise the crew limit from 7 to 8 persons for limited access vessels and from 5 to 6 persons on limited access small dredge vessels while on a controlled access area trip	3-54
3.3.3.3	Status quo: Continue 7 person crew (5 persons on vessels with small dredge permits) limit on all limited access vessels	3-55
3.3.4	Trip exchange deadline	3-55
3.3.4.1	Preferred alternative: Elimination of the June 1 deadline for controlled access area trip exchanges (proposed action).....	3-55
3.3.4.2	Status quo: Require trip exchanges to be completed by June 1, or 90 days after allocations are made.....	3-55
3.3.5	Controlled access area trip exchanges.....	3-56
3.3.5.1	Preferred alternative: One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk Area trips with another vessel (proposed action)	3-56
3.3.5.2	Exchanges of 2006 Georges Bank access trips and open area DAS with another limited access vessel.....	3-57
3.3.5.3	Preferred alternative: One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon Area trips authorized to be used in the 2006 fishing year (proposed action)	3-58
3.3.5.4	Preferred alternative: One to one exchanges of controlled access area trips for controlled access area trips open to fishing during the same fishing year (Status quo) (proposed action)	3-59
3.3.6	Broken trip exemption program	3-59
3.3.6.1	60-day carry forward of compensation trips (proposed action).....	3-59
3.3.6.2	Status quo: No carry forward of compensation trips	3-59
3.3.7	Research set-aside program (none selected for proposed action)	3-60
3.3.7.1	Compensation for multi-year research projects (RSA management issue #1)	3-60
3.3.7.2	Disposition of unused research set-asides (RSA management issue #2).....	3-60
3.3.7.3	Cooperative survey dedicated set-aside (RSA management issue #3)	3-61
3.3.7.4	Allowance of combination research/compensation trips in areas closed to scallop fishing (RSA management issue # 4).....	3-62
3.3.7.5	Status quo	3-62
3.4	Considered and Rejected Alternatives	3-63
3.4.1	General Category Measures	3-63
3.4.1.1	Limited entry and a permit moratorium	3-63
3.4.1.2	Fleet quotas.....	3-63
3.4.1.3	Possession limit time period	3-63
3.4.1.4	Limiting number of scallop trips per week.....	3-63
3.4.1.5	Effort controls via landings windows	3-64

3.4.1.6	Ten and one-half foot maximum dredge width and a scallop bycatch allowance for vessels using trawls	3-64
3.4.1.7	Status quo: Other than in areas which require NE Multispecies FMP exemptions, maximum 31 foot dredge width, 144 foot trawl sweep	3-64
3.4.1.8	Crew limits (range 3 to 5 persons).....	3-64
3.4.1.9	Maximum number of general category scallop trips	3-64
3.4.1.10	Scallop possession limit adjustment	3-65
3.4.2	Hudson Canyon Area Rotation Measures	3-65
3.4.2.1	Allow vessels to take unused 2005 Hudson Canyon Area trips during 2006 in the Georges Bank controlled access areas	3-65
3.4.2.2	Allow vessels to take unused 2005 Hudson Canyon Area trips during 2006 in open fishing areas	3-65
3.4.2.3	Close the Hudson Canyon Area to scallop fishing during 2006 and 2007	3-65
3.4.3	Elephant Trunk Area (ETA) Rotation Measures.....	3-66
3.4.3.1	Split-season trip allocations.....	3-66
3.4.3.2	Unrestricted trip allocations.....	3-66
3.4.4	Controlled access area trip exchanges.....	3-66
3.4.4.1	DAS leasing.....	3-66
3.4.4.2	Default open area DAS.....	3-67
3.4.5	Research set-aside program.....	3-67
3.4.5.1	Experimental fishing in closed areas	3-67
4.0	DESCRIPTION OF AFFECTED ENVIRONMENT (2005 SAFE REPORT)	4-1
4.1	The Atlantic Sea Scallop Resource	4-1
4.1.1	Biomass	4-2
4.1.2	Fishing mortality	4-3
4.2	Non-target Species	4-5
4.3	Threatened, Endangered and Other Protected Species	4-7
4.3.1	Sea Turtle Interactions	4-8
4.4	Physical Environment and Essential Fish Habitat	4-13
4.5	Fishery Businesses and Communities.....	4-17
4.5.1	Participation and permits in sea scallop fishery	4-17
4.5.2	Trends in landings, revenues and prices in the sea scallop fishery	4-19
4.5.3	Limited access scallop fishery.....	4-20
4.5.4	General Category Fleet.....	4-26
4.5.5	Fishing Practices and Use of Space.....	4-33
4.5.6	The scallop ports	4-34
5.0	ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES.....	5-1
5.1	Biological Impacts	5-1
5.1.1	Impacts on the Sea Scallop Resource.....	5-1
5.1.1.1	Area Specific Limits on Fishing by Limited Access Vessels.....	5-1
5.1.1.2	Area Rotation Measures and Allocations	5-1
5.1.1.3	Open Area Management.....	5-42
5.1.1.4	Limited Access Crew Limits	5-46
5.1.1.5	Other Measures (trip exchange deadline, trip exchanges, and broken trip exemption program)	5-52
5.1.2	Impacts on Non-target Species.....	5-52
5.1.2.1	Areas specific limits on fishing by limited access vessels	5-54
5.1.2.2	Area Rotation Measures	5-54
5.1.2.3	Effect of transfers on yellowtail flounder bycatch	5-71
5.1.2.4	Open Area Management.....	5-71
5.1.2.5	Limited access crew limits on limited access vessels.....	5-72

5.1.2.6	Trip exchange deadline & controlled access area trip exchanges	5-72
5.1.2.7	Broken trip exemption program	5-73
5.1.2.8	Research set-aside program	5-73
5.1.3	Impacts on Threatened, Endangered, and Other Protected Species	5-73
5.1.3.1	Area specific limits on fishing by limited access vessels and a maximum number of trips by area with a scallop possession limit (Section 3.3.1.1).....	5-74
5.1.3.2	Georges Bank area access measures (Section 3.3.1.2)	5-74
5.1.3.3	Hudson Canyon area rotation measures (Section 3.3.1.3).....	5-76
5.1.3.4	Elephant Trunk Area (ETA) rotation measures (Section 3.3.1.4).....	5-76
5.1.3.5	Procedures to adjust Elephant Trunk Area allocations (Section 3.3.1.5)	5-78
5.1.3.6	Delmarva Area Rotation Closure (Section 3.3.1.6).....	5-78
5.1.3.7	Open Area Management (Section 3.3.2)	5-79
5.1.3.8	Limited Access Crew Limits (Section 3.3.3)	5-80
5.1.3.9	Other Measures (Sections 3.3.4, 3.3.5, 3.3.6, and 3.3.7).....	5-80
5.1.4	Impacts on Essential Fish Habitat	5-81
5.1.4.1	Impacts of Area specific limits on fishing by limited access vessels	5-81
5.1.4.2	George’s Bank Area Access Schedule	5-82
5.1.4.3	Impacts of Hudson Canyon area (HCA) rotation measures	5-85
5.1.4.4	Impacts of Elephant Trunk Area (ETA) rotation measures.....	5-86
5.1.4.5	Procedures to adjust ETA allocations.....	5-87
5.1.4.6	Impacts of Delmarva area rotation closure.....	5-87
5.1.4.7	Impacts of Open Area Management.....	5-87
5.1.4.8	Impacts of Limited Access Crew Limits	5-89
5.1.4.9	Trip Exchange Deadline	5-90
5.1.4.10	Controlled Access Area Trip Exchanges.....	5-90
5.1.4.11	Broken Trip Exemption Program	5-90
5.1.4.12	Research Set-Aside Program	5-91
5.2	Economic Impacts.....	Error! Bookmark not defined.
5.2.1	Economic impacts of the rotation area alternatives.....	Error! Bookmark not defined.
5.2.1.1	Summary of economic impacts	Error! Bookmark not defined.
5.2.1.2	Aggregate economic impacts in the short- term (2006-2007)	Error! Bookmark not defined.
5.2.1.3	Aggregate economic impacts in the long-term (2008-2019).....	Error! Bookmark not defined.
5.2.1.4	Economic impacts of no action and status quo alternatives	Error! Bookmark not defined.
5.2.1.5	Discussion of prices, costs and sources of uncertainty in the analyses	Error! Bookmark not defined.
5.2.2	Economic impacts of controlled access area alternatives, area specific limits, trip and quota allocations	Error! Bookmark not defined.
5.2.2.1	Area specific limits on fishing by limited access vessels.....	Error! Bookmark not defined.
5.2.2.2	Georges Bank area access measures.....	Error! Bookmark not defined.
5.2.2.3	Adjustments when yellowtail flounder catches reach the 10% TAC limit.....	Error! Bookmark not defined.
5.2.2.4	Hudson Canyon Area Rotation Measures	Error! Bookmark not defined.
5.2.2.5	Elephant Trunk area (ETA) rotation measures.....	Error! Bookmark not defined.
5.2.2.6	Procedures to adjust Elephant Trunk Area (ETA) allocations	Error! Bookmark not defined.
5.2.2.7	Economic impacts of Delmarva closures	Error! Bookmark not defined.
5.2.3	Open area management	Error! Bookmark not defined.

5.2.4	Economic Impacts of the elimination of crew limits for controlled access areas	Error! Bookmark not defined.
5.2.5	Economic Impacts of the controlled access area trip exchanges.....	Error! Bookmark not defined.
5.2.5.1	Economic Impacts of the elimination of the June 1 deadline for controlled access area trip exchanges	Error! Bookmark not defined.
5.2.5.2	One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel	Error! Bookmark not defined.
5.2.5.3	Exchanges of 2006 Georges Bank access trips and open area DAS with another limited access vessel.....	Error! Bookmark not defined.
5.2.5.4	One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year	Error! Bookmark not defined.
5.2.5.5	One to one exchanges of controlled access area trips for controlled access area trips open to fishing during the same fishing year (status quo) (proposed action)	Error! Bookmark not defined.
5.2.5.6	Economic impacts of broken trip exemption program (60-day carry forward).....	Error! Bookmark not defined.
5.2.6	Economic impacts of the research set-aside program	Error! Bookmark not defined.
5.3	Social Impacts	Error! Bookmark not defined.
5.3.1	Area Specific landings limits (quota).....	Error! Bookmark not defined.
5.3.2	Georges Bank Access Area Measures.....	Error! Bookmark not defined.
5.3.3	Hudson Canyon trip exchanges.....	Error! Bookmark not defined.
5.3.4	Elephant Trunk Area Rotation	Error! Bookmark not defined.
5.3.5	Adjustments to Elephant Truck Area Allocations.....	Error! Bookmark not defined.
5.3.6	Delmarva Area Rotation.....	Error! Bookmark not defined.
5.3.7	Open Area allocation.....	Error! Bookmark not defined.
5.3.8	Crew Limits.....	Error! Bookmark not defined.
5.3.9	Trip exchange deadline	Error! Bookmark not defined.
5.3.10	Trip exchange	Error! Bookmark not defined.
5.3.11	Broken trip 60-day carry forward	Error! Bookmark not defined.
5.3.12	Research-set-aside program	Error! Bookmark not defined.
5.4	Cumulative impacts.....	5-134
5.4.1	Introduction to Cumulative Impacts.....	5-134
5.4.2	Past, Present and Reasonably Foreseeable Future Actions Related to Fishing Activities	5-135
5.4.2.1	Sea Scallop Resource and Non-target Species	5-135
5.4.2.2	Threatened, Endangered and Other Protected Species	5-137
5.4.2.3	Habitat	5-141
5.4.2.4	Human Communities.....	5-142
5.4.3	Summary of Past, Present, and Reasonably Foreseeable Future Actions Related to Non-Fishing Activities	5-143
5.4.4	Cumulative Impacts of the Proposed Action.....	5-148
5.4.4.1	Sea scallop resource	5-148
5.4.4.2	Non-target species	5-148
5.4.4.3	Protected and Endangered Species	5-149
5.4.4.4	Essential Fish Habitat	5-149
5.4.4.5	Human Environment	5-150
5.4.4.6	Summary of Cumulative Impacts	5-150
6.0	APPLICABLE LAW	6-1
6.1	Magnuson-Stevens Fishery Conservation and Management Act	6-1
6.1.1	Compliance with National Standards.....	6-1
6.1.1.1	National Standard 1: Overfishing and Optimum Yield	6-1

6.1.1.2	National Standard 2: Best Available Science	6-1
6.1.1.3	National Standard 3: Management Unit	6-2
6.1.1.4	National Standard 4: Fairness and equity	6-2
6.1.1.5	National Standard 5: Efficiency	6-2
6.1.1.6	National Standard 6: Variations and Contingencies.....	6-3
6.1.1.7	National Standard 7: Cost and Duplication	6-3
6.1.1.8	National Standard 8: Communities.....	6-3
6.1.1.9	National Standard 9: Bycatch	6-4
6.1.1.10	National Standard 10: Safety	6-5
6.1.2	Required Provisions of an FMP	6-5
6.1.3	Required Provisions of Other FMPs	6-6
6.1.3.1	Skate Baseline Review	6-6
6.1.3.2	Updated Stock Status for Thorny and Barndoor Skates Error! Bookmark not defined.	
6.1.3.3	Summary of potential impacts on skate mortality from the measures under consideration that modify the NE Multispecies year-round closed areas Error! Bookmark not defined.	
6.1.3.4	Summary of potential impacts on skate mortality from the measures under consideration that modify the Scallop DAS restrictions Error! Bookmark not defined.	
6.1.3.5	Conclusions	Error! Bookmark not defined.
6.1.4	EFH Assessment	6-6
6.1.4.1	Description of Action	6-17
6.1.4.2	Assessing the Potential Adverse Impacts	6-18
6.1.4.3	Minimizing or Mitigating Adverse Impacts	6-20
6.1.4.4	Conclusions	6-21
6.2	NEPA	6-22
6.2.1	Environmental Assessment	6-22
6.2.2	Finding of No Significant Impact.....	6-22
6.2.3	List of Preparers; Point of Contact.....	6-26
6.2.4	Agencies Consulted.....	6-27
6.2.5	Opportunity for Public Comment.....	6-27
6.3	Endangered Species Act.....	6-27
6.4	Marine Mammal Protection Act	6-28
6.5	Coastal Zone Management Act.....	6-28
6.6	Administrative Procedure Act.....	6-28
6.7	Data Quality Act	6-28
6.7.1	Utility	6-28
6.7.2	Integrity	6-29
6.7.3	Objectivity.....	6-29
6.8	Executive Order 13158 (Marine Protected Areas).....	6-30
6.9	Executive Order 13132 – Federalism.....	6-30
6.10	Executive Order 12898 – Environmental Justice.....	6-30
6.11	Paperwork Reduction Act.....	6-31
6.12	Initial Regulatory Flexibility Act/E.O. 12866.....	6-31
6.12.1	Introduction.....	Error! Bookmark not defined.
6.12.2	Determination of Significant Economic Impact on a Substantial Number of Small Entities Error! Bookmark not defined.	
6.12.2.1	Description of the small business entities.....	Error! Bookmark not defined.
6.12.2.2	Determination of significant effects	Error! Bookmark not defined.
6.12.2.3	Economic impacts of the proposed measures and alternatives.... Error! Bookmark not defined.	
6.12.2.4	Indirectly affected industries	Error! Bookmark not defined.

6.12.2.5	Identification on Overlapping Regulations.....	Error! Bookmark not defined.
6.12.2.6	Conclusion.....	Error! Bookmark not defined.
6.13	Regulatory Impact Review.....	6-31
6.13.1	Introduction.....	Error! Bookmark not defined.
6.13.2	Economic Impacts.....	Error! Bookmark not defined.
6.13.2.1	Summary of Regulatory Impacts.....	Error! Bookmark not defined.
6.13.3	Enforcement Costs.....	Error! Bookmark not defined.
6.13.4	Determination of Significant Regulatory Action.....	Error! Bookmark not defined.
7.0	GLOSSARY.....	7-1
8.0	LITERATURE CITED.....	7-1

ATTACHMENTS

- A** Decision Document for the Final Council Meeting (November 17, 2005)
- B** List of Threatened, Endangered, and Other Protected Species Inhabiting the Scallop Management Unit (Excerpted from Amendment 10 and updated with information in Section 4.3 of this document)

LIST OF APPENDICES RELEVANT TO THE 2005 SAFE REPORT

- I** Economic and Social Trends in the Sea Scallop Fishery
- II** Methods used for Sea Scallop Biological Projections
- III** Total Bycatch Estimate of Loggerhead Turtles in the 2004 Atlantic Sea Scallop Dredge Fishery
- IV** Summary of 2005 Sea Safety Information for the First Coast Guard District
- V** Methods and Detailed Analysis of Finfish Bycatch in the Scallop Access Programs
- VI** Updated Scallop Assessment – Scallop Plan Development Team Report

1.1 List of Tables

Table 1 – Cross reference of sections that describe and analyze the proposed action.....	5
Table 2. Examples of proposed permissible and prohibited controlled access area trip exchanges.	3-8
Table 3. Comparison of allocated DAS for full-time vessels under the No Action and Status Quo Alternatives.....	3-10
Table 4. Comparison of No Action, Status Quo, and other Framework 18 alternatives.....	3-11
Table 5. Comparison of management measures contemplated in Framework 18 and No Action which could apply at the start of the 2006 fishing year.	Error! Bookmark not defined.
Table 6. Comparison of estimated maximum number of trips for full-time limited access vessels by management area.	3-17

Table 7. Estimated controlled access area allocations and possession limits. Controlled access area DAS allocations are 12 DAS per allocated trip for all vessel categories.	3-18
Table 8. Summary of controlled access trip and DAS allocations under consideration (proposed is shaded).	3-18
Table 9. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.	3-25
Table 10. Specifications for Closed Area I based on estimated exploitable biomass.	3-25
Table 11. Specifications for Closed Area II based on estimated exploitable biomass.	3-26
Table 12. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.	3-27
Table 13. Specifications for Closed Area I based on estimated exploitable biomass.	3-27
Table 14. Specifications for Closed Area II based on estimated exploitable biomass.	3-28
Table 15. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.	3-29
Table 16. Specifications for Closed Area I based on estimated exploitable biomass.	3-29
Table 17. Specifications for Closed Area II based on estimated exploitable biomass.	3-30
Table 18. Calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.	3-32
Table 19. A second example calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.	3-33
Table 20. A third example calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.	3-33
Table 21. Example maximum number of trips and allocations, before and after potential mid-season adjustment.	3-34
Table 22. Estimated specifications for Elephant Trunk Area under the preferred alternative.	3-40
Table 23 – Specifications for the Elephant Trunk Area under the status quo alternative.	3-41
Table 24. Estimated 2006 ETA exploitable biomass associated with the initial TAC and trip allocations in Framework 18.	3-45
Table 25. Proposed boundaries of Delmarva area rotation closure.	3-46
Table 26. Area Rotation and open area DAS management scenarios (10 options analyzed) (proposed action shaded).	3-51
Table 27. Estimated allocations and projected DAS use for open scallop fishing areas, proposed action shaded.	3-52
Table 28. Annual open area DAS set-asides for 2006 and 2007.	3-53
Table 29. Example one-to-one exchanges among two full-time limited access vessels.	3-57
Table 30. Example exchanges among two full-time limited access vessels.	3-58
Table 31. Seasonal Observer Coverage in the Atlantic Sea Scallop Dredge Fishery 2001-2004*	4-9
Table 32. Observed Turtle Interactions by Month and Year in the Atlantic Sea Scallop Dredge Fishery 2001-2004.	4-9
Table 33. Observed Turtle Interactions by Month, Year, and Mid-Atlantic Region in the Atlantic Sea Scallop Dredge Fishery 2001-2004.	4-11
Table 34. Summary species and life stage’s EFH adversely impacted by otter trawling and scallop dredging (gears that adversely impact EFH used in the Scallop fishery).	4-16
Table 35. Scallop Permits by application year.	4-18
Table 36. DAS allocations and fishing effort.	4-19
Table 37. Total scallop landings and revenues by limited access and by vessels with general category permits.	4-20
Table 38. Trends in landings, Revenue and vessel size by limited access vessels.	4-21
Table 39. Landings by limited access vessels by gear type.	4-22
Table 40. Trends in landings, Revenue and vessel size by full-time vessels.	4-23
Table 41. Revenue per vessel for full-time vessels by tonnage class.	4-24
Table 42. Scallop revenue per full-time vessel by region (determined by home state).	4-25
Table 43. Average gross tonnage of full-time vessels by region.	4-26
Table 44. Percentage of Revenue from Scallops (2004).	4-26

Table 45. General category landings by permit and gear type.....	4-27
Table 46. General category vessel characteristics and activity in 2003 and 2004.	4-27
Table 47. General category activity by region of homeport in 2004.	4-28
Table 48. General category landings by gear and area-fished, and according to new activity (as a % of total general category landings in 2004).	4-28
Table 49. General category landings by gear and fishing area by year and gear type (as a % of total general category landings).	4-29
Table 50. Landings and number of general category vessels by maximum scallop pounds per trip.	4-30
Table 51. Landings and number of general category vessels by maximum scallop pounds per trip and activity (2004).	4-30
Table 52. General category vessels by the number of scallop trips in a year.	4-31
Table 53. General category vessel by percentage of annual revenue from scallops (2004)	4-32
Table 54. General Category Vessels catching at least half of their annual scallop catch in one statistical area, Fishing years 1995-2004. Source: 1994-2005 logbooks.	4-34
Table 55. Limited Access Vessels catching at least half of their annual scallop catch in one statistical area, Fishing years 1995-2004. Source: 1994-2005 logbooks.	4-34
Table 56 Management Scenarios	5-2
Table 57. Projection scenarios performed to analyze the effect of area rotation alternatives.....	5-3
Table 58 Short Term Summary (2006-2007 means except for biomass)	5-4
Table 59 Long Term Summary (2006-2020 means).....	5-5
Table 60. Estimated maximum number of trips allocated by area to achieve the TACs.	5-6
Table 61. Total controlled access area trip allocations and possession limits by limited access permit category and fishing year.	5-7
Table 62. Comparison of controlled access area trip allocation alternatives.	5-10
Table 63. Estimated 2006 and 2007 Closed Area I fishing mortality at various 2004 exploitable biomass amounts, with and without (CA1 contingency) a 2006 Closed Area I trip.	5-12
Table 64. Projected trends in initial exploitable biomass (mt) at various assumed 2004 biomass levels within Closed Area I access area boundaries.	5-12
Table 65. Projected trends in landings per DAS (lbs./day) at various assumed 2004 biomass levels within Closed Area I access area boundaries.	5-13
Table 66. Projected trends in area swept (nm ²) at various assumed 2004 biomass levels within Closed Area I access area boundaries.	5-13
Table 67. Estimated 2006 and 2008 Closed Area II fishing mortality with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.	5-15
Table 68. Projected trends in exploitable biomass within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.	5-15
Table 69. Projected trends in landings per DAS within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.	5-15
Table 70. Projected trends in area swept (nm ²) within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.	5-15
Table 71. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size.	5-19
Table 72. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size.	5-21
Table 73. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size.	5-22
Table 74. Adjustment of Elephant Trunk Area trips to keep fishing mortality between 0.16 and 0.32 over a range of 2006 total exploitable biomass values.....	5-26
Table 75. Projected fishing mortality vs. number of scallops landed by rotation area management alternative.....	5-27
Table 76. Total projected area swept for two comparative standard projections.....	5-36

Table 77. Distribution of 2006 exploitable biomass by area and management status.	5-38
Table 78. Distribution of 2007 exploitable biomass by area and management status.	5-39
Table 79. Fishing mortality estimates by sub-region classified for fishing with open area DAS, by alternative.....	5-44
Table 80. Total open area DAS allocations, estimated DAS used, and estimated total fishing mortality for various Framework 18 area rotation scenarios and open area effort allocations to achieve optimum yield.	5-46
Table 81. Average observed catch rates in access and open areas during 2004, including the Hudson Canyon Area.	5-55
Table 82. Projected area swept per DAS used in access and open areas for the preferred alternative ...	5-56
Table 83. Average observed catch rates in access and open areas during 2004, excluding the Hudson Canyon Area.	5-57
Table 84. Summary of 2004 yellowtail flounder bycatch rates by stock area from sea sampled trips and total catch estimates.	5-60
Table 85. Summary of 2004 cod bycatch rates by stock area from sea sampled trips and total catch estimates.....	5-60
Table 86. Summary of 2004 monkfish bycatch rates by stock area from sea sampled trips and total catch estimates.....	5-60
Table 87. Summary of 2004 barndoor skate bycatch rates by stock area from sea sampled trips and total catch estimates.	5-61
Table 88. Projection of yellowtail flounder bycatch in access areas by management alternative for 2006 and 2007.....	5-61
Table 89. Total area swept (nm ²) for all trips taken in open areas and expected average scallop landings (lbs. meats) per trip in open areas for the preferred alternative in 2006.	5-63
Table 90. Example of DAS tradeoffs in 2006 for unused trips with Framework 18 area rotation, a 2 year extension of the Hudson Canyon Area, and 20,000 open area DAS allocation.....	5-64
Table 91. Area swept estimates for trips transferred from access to open areas during 2006.	5-65
Table 92. DAS tradeoffs in 2007 for unused trips with Framework 18 area rotation, a 2 year extension of the Hudson Canyon Area, and 20,000 open area DAS allocation.	5-65
Table 93. Area swept estimates for trips transferred from access to open areas during 2007.	5-66
Table 94. Estimated DAS tradeoffs and open area catches in 2006 for Alternative 1.....	5-67
Table 95. Area swept per trip estimates for 2006 yellowtail flounder closure DAS transfer alternatives. .5-68	
Table 96. Estimated DAS tradeoffs and open area catches in 2007 for Alternative 1.....	5-69
Table 97. Area swept per trip estimates for 2007 yellowtail flounder closure DAS transfer alternatives. .5-70	
Table 98. Yellowtail flounder catch rate per hour fished on observed trips during 2004.....	5-71
Table 99. Projected Area Swept for Rotational Area Management Alternatives	5-89
Table 100. Area Rotation Alternatives	Error! Bookmark not defined.
Table 101. Short-term economic impacts of area rotation options on landings, prices and revenues (in 2004 inflation adjusted prices) (proposed action shaded).....	Error! Bookmark not defined.
Table 102. Short-term economic impacts of area rotation options on producer, consumer and total benefits (in 2004 inflation adjusted prices) (proposed action shaded)	Error! Bookmark not defined.
Table 103. Short-term cumulative benefits compared to no action (in 2004 inflation adjusted prices)	Error! Bookmark not defined.
Table 104. Short-term cumulative benefits compared to action in 1996 prices (adjusted for inflation using GDP deflator).....	Error! Bookmark not defined.
Table 105. Long-term economic impacts of area rotation options on landings, prices and revenues (in 2004 inflation adjusted prices, assuming 1.4% increase in disposable income).....	Error! Bookmark not defined.

Table 106. Long-term present value of cumulative benefits compared to no action during 2008-2019 (in 2004 inflation adjusted prices).....	Error! Bookmark not defined.
Table 107. Long-term cumulative benefits compared to no action in 1996 prices (adjusted for inflation using GDP deflator).....	Error! Bookmark not defined.
Table 108. Composition of scallop landings and price by market category	Error! Bookmark not defined.
Table 109. Variable costs per full-time vessel during 2001-2004 (in 2004 inflation adjusted prices)	Error! Bookmark not defined.
Table 110. Estimated LPUE from controlled access areas for the proposed option including 20,000 open area DAS and closure of Delmarva starting in 2007.....	Error! Bookmark not defined.
Table 111. Average trip duration, LPUE, and scallop landings in 2004 by full-time limited access holders	Error! Bookmark not defined.
Table 112. Cost saving estimates from area specific quotas.....	Error! Bookmark not defined.
Table 113. Scenario analysis of the economic impacts of a potential race to fish...	Error! Bookmark not defined.
Table 114. Landings and number of trips during the proposed closure seasons for areas 621 and 622.	Error! Bookmark not defined.
Table 115. Landings and number of trips during the alternative closure season for areas 621 and 622.	Error! Bookmark not defined.
Table 116. The activity by full-time limited access vessels by specific areas in Mid-Atlantic	Error! Bookmark not defined.
Table 117. The activity by part-time limited access vessels by specific areas in Mid-Atlantic	Error! Bookmark not defined.
Table 118. Scallop landings and fishing activity by 3 digit statistical area	Error! Bookmark not defined.
Table 119. Scallop Revenue and characteristics of vessels that fished in Delmarva 626 area	Error! Bookmark not defined.
Table 120. Full-time vessels that fished Mid-Atlantic region only by their % landings from 3 digit statistical area 626.....	Error! Bookmark not defined.
Table 121. Full-time vessel activity by home state and area fished in 2004.....	Error! Bookmark not defined.
Table 122. A scenario analysis of economic impacts of increasing of crew size assuming constant increase in LPUE with additional crew.....	Error! Bookmark not defined.
Table 123. A scenario analysis of economic impacts of increasing of crew size assuming exponential increase in LPUE with additional crew.....	Error! Bookmark not defined.
Table 124 - Trip characteristics in the proposed Delmarva closure (2004 logbooks)	Error! Bookmark not defined.
Table 125 Use of the proposed Delmarva closure, by port of landing (2004 logbooks) ..	Error! Bookmark not defined.
Table 126- Potential non-fishing threats to fish habitat in the New England region prioritized within regions (H = high; M = moderate; L = low)2	5-144
Table 127 – Summary of past, present, and reasonably foreseeable future actions related to fishing and non-fishing actions.....	5-147
Table 128 – Summary of cumulative impacts of the proposed action on the sea scallop resource	5-152
Table 129 – Summary of cumulative impacts of the proposed action on non-target species	5-155
Table 130 – Summary of cumulative impacts of the proposed action on protected and endangered species	5-158
Table 131 – Summary of cumulative impacts of the proposed action on essential fish habitat	5-160
Table 132 - Summary of cumulative impacts of the proposed action on the human environment.....	5-162
Table 133 - Summary of NEFSC biomass indices for barndoor and thorny skate from 1992 through 2004	Error! Bookmark not defined.
Table 134 – Number of barndoor and thorny skates from the NMFS Autumn trawl survey (1963 through 2003).....	Error! Bookmark not defined.

Table 135 – Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the Groundfish closed areas (1963 through 2003). **Error! Bookmark not defined.**

Table 136 – Allocated DAS for all three limited access scallop vessel categories, as well as DAS allocations for fishing years 2006-2007 under the proposed action..... **Error! Bookmark not defined.**

Table 137 –Scallop DAS allocated and DAS used for fishing years 1999 through 2005, and DAS allocated and projected for use under the proposed action for 2006 and 2007..... **Error! Bookmark not defined.**

Table 138. Summary of Potential Impacts to Essential Fish Habitat by Proposed Action 6-20

Table 139. Economic impacts of Framework 18 alternatives on producer, consumer and total benefits (in 1996 inflation adjusted prices)..... **Error! Bookmark not defined.**

1.2 List of Figures

Figure 1. Trend in R/V Albatross stratified mean weight per tow, 1994-2005 (preliminary), by region. B_{target} is identified by the FMP as B_{MSY} and is calculated as the biomass that would result from average scallop recruitment and fishing at F_{max} 4-3

Figure 2. Estimated and projected trends in DAS use and fishing mortality. 4-4

Figure 3. Trend in fishing mortality, 1994-2004, by region. $F_{threshold}$ is identified as F_{max} , a fishing mortality rate that maximizes yield-per-recruit..... 4-5

Figure 4. Scallop revenue per full-time dredge vessel (in 2004 inflation adjusted prices) 4-22

Figure 5. Seasonal trend in scallop meat yield at size (shell height) from 1988 samples taken in the Mid-Atlantic region (from Schmitzer 1990). 5-18

Figure 6. 2006 exploitable biomass thresholds that would trigger an adjustment in Elephant Trunk Area trips for 2007 to ensure fishing mortality is between 0.16 and 0.32. 5-24

Figure 7. Projected relationship between 2005 biomass index and total exploitable biomass in 2006. . 5-25

Figure 8. Estimated fishing mortality in 2007 vs. number of scallops landed for various rotation area management alternatives..... 5-28

Figure 9. Comparison between Delmarva Area projections for total survey biomass (g/tow). 5-31

Figure 10. Comparison between Delmarva Area projections for exploitable biomass (mt). 5-32

Figure 11. Comparison between Delmarva Area projections for landings (million pounds). Landings for rotation management (DMV closed 2005 data) are 15% higher in 2007 to 2014 compared to keeping the DMV area open to fishing..... 5-33

Figure 12. Comparison between Delmarva Area projections for landings (million pounds) by size category. Landings of U10 scallops for rotation management (DMV closed 2005 data) are 180% higher in 2007 to 2014 compared to keeping the DMV area open to fishing. 5-34

Figure 13. Comparison between Delmarva Area projections for average landings per DAS..... 5-35

Figure 14. Comparison between Delmarva Area projections for total area swept (nm^2). Total area swept is 32% less for DMV area rotation than keeping the area open to fishing during 2007 to 2014 (170 nm^2 per year vs. 250 nm^2 per year). 5-36

Figure 15. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons, assumed to work 14 hr/d and shucking scallops for 30 min/hr..... 5-48

Figure 16. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons, assumed to work 16 hr/d and shucking scallops for 40 min/hr..... 5-49

Figure 17. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons. 5-50

Figure 18. Days to catch and shuck 18,000 lbs. of scallops. Steaming time when the crew is not shucking scallops must be added to these estimates to compare with dock-to-dock trip duration. 5-51

Figure 19. Shucking capacity compared to example catch rate of the gear and vessel. As an example, the catch rate of 15 count scallops is 3,200 lbs./day, but 4,000 lbs./day of 25 count scallops. 5-51

Figure 20. Monthly mean and variation of air temperature (left) and sea surface temperature (right) for Station 440095-59

Figure 21. Reported fishing locations by vessels with general category permits using dredges to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports.....**Error!**
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Figure 22. Reported fishing locations by vessels with general category permits using scallop trawls to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports **Error!**
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Figure 23. Reported fishing locations by vessels with general category permits using finfish trawls to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports.....**Error!**
Bookmark not defined.

1.3 List of Maps

Map 1. Boundaries of Georges Bank Access Areas (outlined in bold), showing the distribution of scallop catches during calendar year 2004. Note: Closed Area I was not open in 2004.3-24

Map 2. Boundaries of Georges Bank access areas (bold outline) per court order on *Oceana Inc. v. Evans et al.* (8/2/05), showing the distribution of scallop catches during fishing year 2000.3-31

Map 3. Boundaries of the Hudson Canyon Area3-36

Map 4. Location of the Elephant Trunk Area, SE of Delaware Bay and Cape May, NJ overlaid with distribution of scallop catch during calendar year 2004.3-39

Map 5. Boundaries of the Delmarva Area.3-47

Map 6. Distribution of < 70 mm scallops in the 2005 NMFS annual scallop survey, showing proposed boundaries of a new scallop rotation management area, immediately south of the ETA slated to re-open to fishing in 2007.3-48

Map 7 Turtle Bycatch in the Atlantic Sea Scallop Dredge Fishery 2001-2004 (Observer Database). ...4-10

Map 8 Predicted bycatch rates of turtles in the Mid-Atlantic sea scallop dredge fishery, June to November 2004 (Murray 2005).4-13

Map 9. Comparison of Amendment 10 access area boundaries with the distribution of scallop catches in 2004.5-8

Map 10. Comparison of Amendment 10 access area boundaries with the distribution of scallop catches in 2000.5-9

Map 11. Geographic distribution of 1988 meat yield samples taken by Schmitzer (1990).5-20

Map 12. Distribution of scallops smaller than 70 mm in the 2005 R/V Albatross scallop survey. Areas shown, from north to south, include the Hudson Canyon Area, the Elephant Trunk Area, and proposed the proposed DMV Area closure.5-29

Map 13. Distribution of 2004 scallop catches by state of landing.5-41

Map 14 Overlap of habitat closed areas established by Amendment 10 to the Atlantic Sea Scallop FMP (shaded) versus habitat closed areas established by Amendment 13 to the Northeast Multispecies FMP (hatched). Both areas are currently closed to scallop fishing.....5-84

Map 15 – Distribution of Barndoor skate from NMFS Autumn trawl survey data (1963 – 2003).....**Error!**
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Map 16 - Distribution of Thorny skate from NMFS Autumn trawl survey data (1963 –2003).....**Error!**
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1.4 List of Acronyms

A10 – Amendment 10 to the Atlantic Sea Scallop Fishery Management Plan
A13 – Amendment 13 to the Northeast Multispecies Fishery Management Plan
BMSY – Biomass Maximum Sustainable Yield
BO – Biological opinion
CEQ – Council on Environmental Quality
CA1 – Closed Area I
CA2 – Closed Area II
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.
DAS – Day-at-sea
EA – Environmental Assessment
ESA – Endangered Species Act
EFH – Essential Fish Habitat
EFH designation life stages
A – Adult life stage
J – Juvenile life stage
E – Egg life stage
FMP – Fishery Management Plan
FR – Federal Register
FSEIS – Final supplemental environmental impact statement
FW13 – Framework Adjustment 13 to the Atlantic Sea Scallop Fishery Management Plan, which allowed access for scallop fishing in parts of Closed Area I, Closed Area II, and the Nantucket Lightship Area
GB – Georges Bank
HAPC – Habitat Area of Particular Concern
LPUE – Landings per unit effort, usually a DAS in this document
IRFA – Initial Regulatory Flexibility Analysis
MAFMC – Mid-Atlantic Fishery Management Council
NAAA – Northwest Atlantic Analysis Area
NEFMC – New England Fishery Management Council
NEFMC – New England Fishery Management Council
NEFSC – Northeast Fisheries Science Center
NEPA – National Environmental Policy Act
NLSA – Nantucket Lightship Area
NMFS – National Marine Fisheries Service
PSP – Paralytic Shellfish Poisoning
RIR – Regulatory Impact Review
SAP – Special access program – a provision in the Multispecies FMP that may allow special fisheries in closed groundfish areas under special rules to limit the impact on overfished species.
SARC – Stock Assessment Review Committee
SAW – Stock assessment workshop
SBNMS – Stellwagen Bank Marine Sanctuary
SEIS – Supplemental Environmental Impact Statement
SMAST – School of Marine Science and Technology, University of Massachusetts Dartmouth
VMS – Vessel Monitoring System
TAC – Total Allowable Catch. This includes discards for finfish species, but not for scallops which have a much lower discard mortality rate.
U10 – A classification for large scallops, less than 10 meats per pound.

USGS – United States Geological Survey

2.0 INTRODUCTION AND BACKGROUND

2.1 Purpose and Need for Action

The underlying purpose for this action is to achieve the objectives of the Atlantic Sea Scallop Fishery Management Plan (Scallop FMP) to prevent overfishing and improve yield-per-recruit from the Atlantic Sea Scallop Fishery. The primary need of this action is to set specifications to adjust the day-at-sea (DAS) allocations and area rotation schedule for the 2006 and 2007 fishing years as part of the biennial adjustment process implemented under Amendment 10 to the Scallop FMP.

In 2004 Amendment 10 introduced rotation 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 vessels to fish in any area, vessels now have to use a portion of their total DAS allocation 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. The Amendment 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 the next two fishing years, 2006 and 2007. The Scallop Plan Development Team (PDT) reviews scallop abundance data and determines which areas and what level of fishing effort is appropriate to allocate in order to achieve optimum yield.

More specifically this framework adjustment will address four primary management issues:

- Fishery specifications for 2006 and 2007, including limited access DAS allocations, controlled access area TACs and trip allocations. Specifications are proposed to achieve optimum yield, responding to changing resource conditions and new estimates of biomass and scallop distribution. The controlled access area allocations are proposed to allow the catch and landings of large scallops that have grown within the closed groundfish areas on Georges Bank, with restrictions that minimize the impacts and effects on finfish bycatch and habitat to the extent practicable.
- Area rotation adjustments to achieve optimum yield and reduce mortality on areas having abundant small scallops. Area rotation management was adopted by the Council in Amendment 10, as a means to enhance yield from the scallop fishery. Periodic adjustments are needed to respond to changing resource conditions and the appearance of new recruitment. The purpose of the proposed alternatives in Framework Adjustment 18 are therefore to make these needed changes and improve yield while reduce environmental effects by keeping fishing time per DAS low.
- Changes to reduce administrative burdens and risks to safety at sea. Some of the Amendment 10 management measures intended to reduce the incidence of evading the controlled access area regulations increased costs to the industry or may have induced vessels to remain at sea under adverse conditions longer than they should have for fear of losing opportunities to catch scallops.
- Sea turtle interactions have been identified in the sea scallop fishery in the Mid-Atlantic area, particularly in areas where effort is high and during the summer and fall. This action proposes measures that may reduce the potential for interactions between the scallop fishery and sea turtles.

The proposed action is intended for implementation as soon as possible after March 1, 2006 (the beginning of the 2006 fishing year), with some measures taking effect at specific times during 2006 or 2007. During this delay in implementation the management measures would be the same as those under the No Action alternative. These measures and their impacts are described more fully in Section 3.2.4.

According to the current regulations, NMFS would allocate 67 full-time open area DAS (and part-time and occasional DAS on a prorated basis) on March 1, 2006. In addition, vessels would be allocated one trip to fish in each of the Closed Area I and Nantucket Lightship Area access areas, beginning on June 15, 2006. Under the default allocation, DAS used between March 1, 2006 and implementation of Framework 18 would be counted against the final 2006 allocations under the framework adjustment.

The Elephant Trunk Area would remain closed until March 1, 2007 and the Hudson Canyon Area would revert to an open area status on March 1, 2006². Vessels on a limited access DAS could carry no more than 7 persons as crew and the vessel must use gear with rings no less than 4" diameter and twine top mesh no less than 10". Vessels having broken trips would be authorized to take compensation trips before the end of the fishing year and 2006 trip exchanges between vessels must be completed before June 15, 2006. Vessels may exchange Nantucket Lightship Area and Closed Area I trips, so that each vessel would be authorized to take two trips in one area or the other.

Other issues that were considered but not included in this framework because of limitations on time and the scope of actions that may be taken in a framework adjustment were measures to control fishing mortality in the general category fishery, adjustments to the research set aside process, revisions to the standardized bycatch reporting methodology, and other measures described in Section 3.4.

2.2 Background

2.2.1 Scallop management

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). 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 management unit also includes populations found within the Gulf of Maine and Cape Cod Bay. These areas include the territorial seas throughout the range, primarily in Maine (ME) and Massachusetts (MA). Fishing for sea scallops within state territorial waters is not subject to regulation under the FMP except for vessels that hold a Federal scallop permit when scalloping in state waters. Nevertheless, sea scallops within state waters are included within the management unit in recognition of market interactions and the need for complementary state management action.

The Council established the Scallop FMP in 1982. A number of Amendments and Framework Adjustments have been implemented since that time to adjust the original plan. Amendment 4 was implemented in 1994 and introduced major changes in scallop management, including a limited access

² Amendment 10 anticipated that after managing the Hudson Canyon Area by controlled access and increasing fishing mortality targets for five years under area rotation, the surplus biomass from the 1998-2000 closure would have been caught and the area should revert to an open area status until a new strong year class of small scallops occurs there.

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, and an annual framework adjustment process to allow certain measures to be modified in response to changes in the fishery including scallop abundance. Limited access vessels were assigned different DAS limits according to which permit category they qualified for: full-time, part-time or occasional. Amendment 4 also established a planned reduction in the annual day-at-sea allocations for vessels with limited access scallop permits.

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 Map 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 also 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. Scallop resource surveys and experimental fishing activities had identified areas where scallop biomass was very high due to no fishing in the intervening years. These surveys and experimental fisheries provided more precise estimates of total biomass as well as the distribution and amount of finfish bycatch and allowed the Council to open the southern part of Closed Area II.

In 2000 Framework Adjustment 13 to the Scallop FMP authorized full-time and part-time limited access vessels to take three trips in the southern part of Closed Area II during June 15 to August 14, 2000; one trip in the northeast corner of the Nantucket Lightship Area during August 15 to September 30, 2000; and two trips in the central part of Closed Area I from October 1, 2000 to January 31, 2001.

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 due to the enhanced survival of the strong 1997 and 1998 year classes, especially in the Hudson Canyon Area. Following the structure of the highly successful area access program for the Georges Bank closed areas in 2000; the framework adjustment allocated trips to limited access vessels and applied a scallop possession limit and a day-at-sea tradeoff. Unlike the Georges Bank closed area access program, however, Framework Adjustment 14 allowed vessels with general category scallop permits to land 100 lbs. 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 lbs. per trip. This action was needed to achieve the objectives and fishing mortality target specified in Amendment 7, while the Council developed Amendment 10.

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 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.

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 two-percent 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 16 also attempted to make the habitat closed area boundaries implemented under Amendment 10 consistent with the areas later implemented under Amendment 13 to the Northeast Multispecies FMP. However, in August 2005, the Court, in *Oceana v. Evans*, ruled that any revisions to the boundaries under the Scallop FMP must be implemented under a full rule making process via an FMP amendment rather than through the abbreviated rule-making process used in a framework adjustment, and reinstated the EFH closed areas implemented under Amendment 10 to the Scallop FMP. Thus, the habitat closed area boundaries implemented under Amendment 10 are currently in effect. As a result, the remaining areas accessible to scallop vessels under the rotational area management program are substantially smaller in Closed Area I and the Nantucket Lightship Closed Area than anticipated until the court ruling (see Section 3.3.1.2.3 for a more complete discussion).

Framework 17 to the Scallop FMP, which was the most recent action prior to the proposed action, 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 revised the broken trip adjustment provision for limited access scallop vessels fishing in the Sea Scallop Area Access Program, by eliminating the broken trip “penalty”, which may have had a negative influence on vessel operator decisions and safety at sea.

2.2.2 Setting specifications

Specifications are proposed to achieve optimum yield, responding to changing resource conditions and new estimates of biomass and scallop distribution. The controlled access area allocations are proposed to allow the catch and landings of large scallops that have grown within the closed groundfish areas on Georges Bank, with restrictions that minimize the impacts and effects on finfish bycatch and habitat.

After controlled access area allocations are determined, the open area DAS are set at a level (after deducting the expected catches and effort caused by the general category fishery) that would either achieve a fishing mortality target of $F=0.2$ for the entire resource, or in special circumstances be reduced to achieve optimum yield. Such a circumstance may exist for example when a high fraction of the scallop biomass is in closed areas or in a controlled access area where the target fishing mortality is less than $F=0.2$. When this occurs, it takes more and more days in the open areas to achieve an overall $F=0.2$ target, as the amount of biomass in rotation area managements increases.

These conditions are forecast for 2006 and 2007 if the Elephant Trunk Area biomass is as high as estimated and the alternatives in this framework adjustment are approved. In 2006, the Elephant Trunk

Area closure will continue and the scallops in the EFH areas on Georges Bank would be inaccessible. Particularly since the Elephant Trunk Area biomass is forecast to be 33% of the total exploitable scallop biomass for all areas, it would take at least 60,000 open area DAS to achieve a resource wide $F=0.2$ target. In 2006, 50% of the total scallop biomass is forecast to be in closed areas and 26% in access areas. In 2007, 34 percent of the biomass is forecast for the Elephant Trunk Area and it would be open as a controlled access area, but the TAC would be estimated using a $F=0.16$ target. In 2007, 60% of the biomass is forecast to be in access areas and 21% in closed areas. Fishing 40,000 to 60,000 DAS on the remaining 19 to 24 percent of the scallop resource in open areas would be excessive.

Following the procedures in CFR §648.55, the Scallop PDT recommended that the Scallop FMP (under this Framework) should allocate no more than 20,000 open area DAS in 2006 and 2007. This is actually a modest increase in open area DAS, compared with the amounts allocated by Amendment 10 in 2004 and 2005, allowing for a full-time DAS allocation of a bit more than 50 DAS (compared with 42 DAS in 2004 and 40 DAS in 2005). Such an increase in DAS is possible because of the scallop rebuilding that has occurred over the past several years in the open areas. Even with this increase, the overall fishing mortality with a 20,000 open area DAS allocations is forecast to be 0.14 in 2006 and 0.17 in 2007.

In making these recommendations to achieve optimum yield, the PDT considered the effect of the following factors:

- Differential fishing mortality rates for the various spatial components of the resource
- Overall yields from the portions of the scallop resource available to the fishery
- Outlook for phasing in and out closed or controlled access areas under the area rotation program, and
- Potential adverse impacts on EFH.

2.2.3 Area rotation management

Area rotation management was formally adopted by the Council in Amendment 10, as a means to enhance yield from the scallop fishery. Initially the controlled access area programs were developed through previous framework adjustments, but improved and adopted as a primary management tool in Amendment 10. Periodic adjustments are needed to respond to changing resource conditions and the appearance of new recruitment. The proposed alternatives in Framework Adjustment 18 are intended to make these needed changes and improve yield while minimizing environmental effects by keeping fishing time per DAS low.

The Elephant Trunk Area has been closed to scallop fishing since July 2004 and by 2007 the scallops are estimated to be of optimum size for scallop fishing. If no action is taken, the Elephant Trunk Area would re-open for scallop fishing as a fully-open fishing area. Without limiting the number of trips that a vessel may take, the forecasts show that nearly all of the open area DAS would be used on trips in the Elephant Trunk Area, with very high concentrations of fishing activity in a relatively small area. The framework adjustment would limit trips and scallop mortality in the Elephant Trunk Area in a way that produces optimum yield over the long term.

One alternative would establish a TAC associated with a fishing mortality target of 0.16, one-half of the Amendment 10 fishing mortality target for the first year of a rotation area management opening. This approach is proposed because of the imprecision of estimates made from the 2004 survey, when the abundant scallops were small and imprecisely estimated. The 2005 survey data is not yet available for this type of analysis and 2006 surveys will provide a much more precise estimate of the amount of

biomass that will be available in 2007. Due to the length of time it requires to prepare a framework adjustment, an alternative is also proposed to adjust the 2007 Elephant Trunk Area trip allocations through an abbreviated regulatory process, which will rely on triggers to determine when and how the Regional Administrator should make changes of the Elephant Trunk Area trip allocations, or if necessary the open area DAS allocations to achieve optimum yield.

Scallop biomass in the Hudson Canyon Area is much lower than forecast in Amendment 10, which set TACs and trip allocations for 2004 and 2005. As a result, the fishing mortality in the area is expected to be much higher than the target and catch rates are much lower than forecast. If the number of trips taken in 2005 is reduced and unused trips carried forward until 2006 and 2007, it would allow time for growth and recruitment to replenish the scallops that remain. Since some vessels have already taken the three allocated trips for 2005 and some have taken none, the only equitable way to correct the situation is to allow vessels that have unused trips to take them at a later time when the catch rates recover. Closing the area in 2005 would cause the vessels to take their unused trips before the closure, driving up fishing mortality and reducing yield that could otherwise be higher if the trips are taken in 2006 or 2007. Under this framework, during 2006 and 2007, the Hudson Canyon Area would be classified as a restricted fishing area where only vessels with remaining 2005 trips could fish.

High abundance of two-year old scallops were newly observed in an area south of the Elephant Trunk Area during the recently-completed 2005 survey. The PDT examined the distribution of tows having large numbers of small scallops and recommended closure of an area encompassing the scallops. Since these scallops will not become vulnerable to scallop dredges until early 2007, the PDT recommended closure of a new "Delmarva" rotation management area when the Elephant Trunk Area re-opens to scallop fishing in 2007. These scallops may also become vulnerable to fishing in 2006 by vessels using scallop trawls, a gear that has been demonstrated to retain more smaller scallops at age three.

2.2.4 Reducing administrative burdens and risks to safety

In the past year, several problems have arisen from the way that rotation area management is administered in Amendment 10. Some of the Amendment 10 management measures proved to be unnecessarily burdensome, although intended to reduce the incidence of evading the controlled access area regulations. These regulations either increased costs to the industry or may have created situations where vessels remained at sea under adverse conditions longer than they should have for fear of losing opportunities to catch scallops. Framework Adjustment 17 was approved and implemented in August 2005 with measures to relieve the penalty built into the broken trip exemption program. The program still requires a vessel to complete compensation trips by the end of the fishing year, which makes trips made near the end of the fishing year carry extra risk if the vessel cannot make the compensation trip in time.

The broken trip exemption program allows vessels to recoup part or all of the unrealized catches on controlled access area trips when the vessel must return to port without having the authorized 18,000 lbs. of scallops on board. In another program to mitigate the effects of area-specific trip allocations, Amendment 10 allows a vessel to exchange trips with another vessel, so that the vessel may fish closer to port or in more advantageous locations. To be able to effectively monitor the exchanges and track which vessels can take trips, Amendment 10 set a 90-day deadline for exchanging area-specific trips. Once implemented, this deadline has proven to be unnecessary.

One of the principal components of the trip exchange program is having an allocation for an area which can be exchanged. In 2004 and 2005, vessels in the Mid-Atlantic had the opportunity to exchange a Hudson Canyon Area trip for a Georges Bank area trip (and vice versa for vessels that prefer to fish the Georges Bank region). In 2006, Framework 18 does not have a controlled access area in the Mid-Atlantic

region. The Hudson Canyon Area will either become an open fishing area, or a restricted area where only vessels with unused 2005 Hudson Canyon Area trips may fish. As a result, a substantial number of vessels would have no Mid-Atlantic region controlled access area trips to exchange. Vessels in the Mid-Atlantic would therefore be forced to fish in the Georges Bank access areas, regardless of the fishermen's preference or the vessel's ability. Thus, there is a need for a mechanism to allow vessels in the Mid-Atlantic region to have a medium of exchange in return for exchanging a Georges Bank area trip with another vessel.

Amendment 10 continued and improved a research set-aside program which allocates a portion of the TAC and open area DAS to fund cooperative scallop-related research. Administrative problems developed, however, because of the time when the Request for Proposals (RFP) could be published and how long it took to conduct a peer review of proposals and approve research projects. Because of the administrative constraints, researchers often received approval in August and the compensation trips (often on which the research was conducted to conserve costs) had to be completed by the end of the fishing year in February. Hence important research that should be conducted during the spring and early summer was difficult to complete. An ad hoc working group met in May 2005 and recommended a list of changes that could help relieve the problems, some of which required a regulatory change or a change in the FMP.

The purpose of several alternatives in this framework adjustment is to reduce the administrative burden, costs borne by industry from the area-specific allocations, and risks to safety at sea. To address these concerns, the framework adjustment proposes alternatives including:

- Elimination of the June 1 trip exchange deadline
- Inter-annual exchanges of controlled access area trips or exchanges with open area DAS
- A 60-day extension of compensation trips for broken trips experienced during the last 60 days of a fishing year, and
- Adjustments to open area DAS to compensate vessels with unused trips if areas close prematurely due to excessive catches of yellowtail flounder.

2.2.5 Minimize interactions with sea turtles

Sea turtles inhabiting the scallop management unit have been determined to be adversely affected, but not jeopardized by the scallop dredge and trawl fishery in New England and Mid-Atlantic waters. Takes were most recently estimated to be 749 loggerhead turtles in 2003 and 180 in 2004. To address sea turtle/scallop fishery interactions in the context of area rotation management, the Council is proposing to close the Elephant Trunk Access Area to scallop gear during September 1 through October 31 to reduce potential risks of encounters between scallop gear and turtles in the area. The selection of the alternative was based on take information collected in 2003 and 2004 which indicated the greatest number of interactions occurred in these months. Although the Council recognized there is variability in numbers and locations of takes across years, this step is taken as a precautionary step to address interactions while longer-term and more comprehensive solutions are being developed.

2.2.6 Other issues not in this action

2.2.6.1 Measures for the general category fishery

A general category permit is an open access permit that allows any vessel to make an unlimited number of trips landing no more than 400 lbs. per trip or 400 lbs. in any 24-hour period. There has been a rapid increase in both the number of vessels and amount of scallop landed in this fishery because of

increases in the availability of scallops from rebuilding and large recent increases in scallop prices. Landings by these vessels doubled from 1.8 million lbs. in 2003 to 3.6 million lbs. in 2004. Landings from March through June 2005 already total 1.5 million lbs. More importantly, landings by general category vessels as a proportion of total landings have increased from 3.3% in 2003 to 5.8% in 2004 and to 11 percent in 2005.

The Council considered and rejected measures using effort or input controls, because any such measures would affect traditional participants as much as vessels that recently ramped up scallop fishing effort or newly entered the general category scallop fishery. The only acceptable methods that would have a differential effect on new entrants and mortality caused by general category fishing seemed to be setting a TAC and establishing limited access based on the November 2004 control date. Setting a TAC and establishing limited access would be a new management approach and raise concerns about proportional allocations. The Council determined that such actions would be addressed more comprehensively in an amendment, developed immediately after this framework action is completed. Given that the measures that could be considered in this framework action could not absolutely control mortality and because of the analytical requirements and uncertainties, the Council and NOAA Fisheries thought that taking action in this framework adjustment would not achieve the objectives.

Although the growth of the general category fishery raises concerns about overall scallop mortality, the Framework 18 analyses assume a 66% growth of general category landings from 2004 to 2006 and 2007³. Landings that are less than this increase from the general category fishery would not be expected to increase fishing mortality above the annual targets. In addition, some of the open area DAS alternatives reduce the target below $F=0.20$ to achieve optimum yield, thus further reducing the risk of overfishing caused by a growing general category fishery.

2.2.6.2 Standardized bycatch reporting methodology (SBRM)

Recent court rulings on Amendment 13 to the Multispecies FMP, Amendment 10 to the Scallop FMP, and on Frameworks 16/39 to the Scallop and Multispecies FMP have clarified requirements regarding standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in a fishery. In particular, the Court, in Oceana v. Evans, has remanded Amendment 10 to the Scallop FMP to NMFS to address SBRM in accordance with the Court's ruling. The Council intends to address the remand regarding SBRM for the scallop fishery on a comprehensive manner in a separate amendment to the Scallop FMP. In the meantime, the current SBRM will remain in place, including the current level of observer coverage.

³ This estimate accounts for a 40% increase in DAS equivalent effort and a 19% increase in average catch per day by limited access vessels.

3.0 MANAGEMENT ALTERNATIVES

3.1 Summary of the Proposed Action

The Council proposes the following management measures, selected from the alternatives in Section 3.3, as the final preferred action in this framework adjustment. The alternatives are briefly described below along with rationale why the Council selected them as preferred alternatives. The full description, rationale, and analyses of these alternatives have been left in Section 3.3 and Section 5.0 so they can be compared to the other alternatives considered; however, each proposed alternative is identified as *proposed* within the description of alternatives in Section 3.3 and analyses Section 5.0.

3.1.1 Area specific limits on fishing by limited access vessels

The Council decided to continue the status quo option described in Section 3.3.1.1.2, until a more comprehensive allocation system can be developed that includes adequate monitoring, safeguards to maintain safety, and measures to prevent discarding. The proposed action would continue the current regulations that authorize limited access vessels to take a limited number of trips in each controlled access area with a scallop possession limit for each trip. Each access area trip made by a full-time vessel may land up to 18,000 pounds of scallop meats. Part-time vessel may land 40% of the full-time amount and occasional vessels may land 1/12th of the full-time amount.

Rationale: The Council considered area specific allocation of total pounds per vessel with no trip possession limit, but determined that action may be premature. The status quo option has been successful at preventing vessels from landing high volumes of poor quality meat and allows vessels the time and opportunity to target larger scallops in areas where there is less finfish bycatch. It also allows vessels to take fewer crew members and work at a more leisurely pace when and where catch rates are highest. Furthermore, a quota based system would require significantly more monitoring and enforcement, a level that the Council believes is currently inadequate. Presently, law enforcement must only check that a vessel lands no more than 18,000 lbs. of scallop meats from a trip. The trips are automatically monitored and counted by the VMS program. Under a quota-based system, law enforcement would need to monitor landings over an entire year, by area, for each vessel. Such monitoring would require considerably more resources and better controls than are currently in place. Furthermore, there are concerns about safety and social impacts from longer trips that vessels would be expected to take. While the Council did not approve the total pounds per vessel alternative, they did approve an additional reporting requirement that was considered for that alternative. See Section 3.3.6 for a description of that reporting requirement for broken trips.

3.1.2 Georges Bank area access measures

3.1.2.1 Revise the Georges Bank area access schedule

Parts of the multispecies closed areas on Georges Bank have been periodically opened for controlled scallop fishing since 1999. This action considered modifications to the access schedule, with no changes in boundaries. Based on PDT recommendations, the Council selected the “Contingency Alternative” described in Section 3.3.1.2.3 as the proposed action. Under this alternative, five Georges Bank access trips would be allocated in 2006 with the Closed Area I access trip reassigned to Closed Area II. In 2007, two access trips would be allocated (one in Closed Area I and one in Nantucket Lightship). Table 15 - Table 17 show the specifications for the proposed action.

Rationale: The primary reason this alternative was selected is the result of the court's decision in *Oceana v Evans* (08/02/05), which determined that EFH closures implemented under both Amendment 10 to the Scallop FMP and Amendment 13 to the Multispecies FMP apply to scallop vessels (See **Map 2** for the boundaries of the access areas under the Contingency Alternative). As a result of this decision, the Closed Area I access area would be restricted to a smaller area than had been analyzed in support of the Framework 18 Georges Bank access alternative (Section 3.3.1.2.1). Because both the Amendment 10 and Amendment 13 habitat closed area boundaries were ordered by the court concentrating the planned amount of Closed Area I effort into such a small area would cause localized depletion. The Council determined, based on analyses in this document that scallop catch rates would decline, causing increases in fishing effort, bycatch, and habitat effects with no benefit. Closed Area II is capable of supporting another trip without exceeding the rotational area fishing mortality target ($F=0.2$ to 0.3), which the Council set to achieve optimum yield from the Georges Bank access areas.

This alternative furthermore changes the order of rotation that was planned under Framework 16/39, in response to changes in scallop resource conditions.

3.1.2.2 Adjustments when yellowtail flounder catches reach 10% TAC limit

Under current regulations, if the 10% yellowtail flounder TAC is reached and Georges Bank access areas close, vessels that have not taken trips are authorized to take up to two unused trips in the open fishing areas, but the regulations are silent about 2007. The Council proposes to allocate additional open area DAS for each trip not taken before areas close, but at a prorated value of DAS as described in Section 3.3.1.2.4.1. Upon an area closure, each vessel with unused trips would be allocated a specific amount of additional open area DAS, based on this pre-defined ratio. This ratio has been calculated to allow the catch of an equal number of scallops from open areas as would have been caught by the unused trip taken in a given area, ensuring that the overall mortality target would be met. For Closed Area I the proposed pro-ration of transferred open area DAS would be 5.5 DAS, 5.4 DAS for Closed Area II, and 4.9 DAS for Nantucket Lightship (Table 18).

Rationale: The preferred alternative is expected to minimize the loss in pounds and revenue due to the closure of an access area before a vessel takes its trip. This alternative will cause scallop landings to be less than they would on an access area trip, due to the smaller average size of scallops from open areas. This alternative, however, will not cause increases in overall scallop fishing mortality from the effort shift into open areas, while still alleviating the derby-style fishing effects that could be caused by yellowtail flounder TAC closures that offer no mitigation.

3.1.3 Hudson Canyon area (HCA) rotation measures

The Hudson Canyon area was initially closed in 1998 to protect a strong year class of young scallops. This area re-opened as a controlled access area in 2001. Amendment 10 truncated the Hudson Canyon Area because small scallops appeared in what is now known as the Elephant Trunk Area, the northern part overlapping the Hudson Canyon Area. New data indicates that scallop biomass in the Hudson Canyon area in 2005 is much less than had been predicted by Amendment 10 from 2003 survey results. Catch rates dropped quicker than had been anticipated, and many vessels took sub-optimal trips in 2005 or chose to delay taking their 2005 access trips. The proposed action would extend the duration of the Hudson Canyon area access program to reduce this problem. It would allow limited access vessels with unused 2005 trips to delay taking them until 2006 or 2007 and close the area to vessels using open area DAS. No new Hudson Canyon Area trip allocations would be made, effectively closing the area to fishing except for 2005 trips that vessels carried forward for use in 2006 and 2007. Section 3.3.1.3 describes the preferred alternative which would allow vessels with unused 2005 trips to take them during

2006 or 2007. The Council also approved applying this extension to compensation trips for research funded through the 2005 TAC set-aside. On February 28, 2008, the Hudson Canyon area would be open as a regular scallop fishing area.

Rationale: The preferred alternative will have the effect of spreading out effort over time, allowing time for existing scallops and new recruits to grow, and would reduce fishing mortality because vessels might postpone taking 2005 trips. The PDT calculated that fishing mortality in the HCA would be several times the 2005 target if the entire TAC were caught and landed in 2005. Postponing the 2005 trips would increase optimum yield and reduce the effects of high fishing mortality and effort in the HCA if the area is reclassified as an open area. Furthermore, the Council selected to extend the HCA access program because of the positive economic impacts; under the proposed action vessels can lower their costs and increase their profits by taking trips when catch rates increase relative to the 2005 levels.

3.1.4 Elephant Trunk Area (ETA) rotation measures

Amendment 10 closed the ETA to scallop fishing in July 2004 to protect two very strong year classes and anticipated that the scallops would reach optimum size for harvest in 2007. Framework 18 considered several alternatives for managing this access area when it re-opens including how many trips should be allocated, when the area should open and whether or not the area should be closed seasonally to reduce the risk of interactions with sea turtles and reduce scallop and finfish discard mortality.

3.1.4.1 Initial trip allocations

The Council selected precautionary initial trip allocations and set-asides (Section 3.3.1.4.1) relative to the status quo⁴. Trip allocations would be made so that the maximum catch on all authorized trips plus amounts for scallop research (2%), funding observers (1%), and for general category catches (2%) would achieve a fishing mortality target of 0.16, as compared to 0.32 under the status quo. The proposed action would allocate five trips for full-time vessels and a proportionate amount for part-time and occasional as specified in Section 3.3.1.4.1.

Rationale: Some projections for previous controlled access area programs have overestimated biomass and the TAC. Thus a precautionary approach with initially apply lower allocations to reduce the risk of overshooting the area rotation mortality target ($F=0.32$). The framework analysis also suggests that fishing more than five trips per vessel during a fishing year is likely to have undesirable effects including higher safety risks, greater effects on the bottom environment from discarded scallop viscera and a spike in landings, which may adversely affect price. The Council also recognizes that the cumulative value of economic benefits with the preferred alternative will be larger in the long-term, as compared to Status Quo. The ETA controlled access program would also have positive economic impacts on the general category scallop fishery, because these vessels could share the benefits of the program through a TAC set-aside.

⁴ The status quo in this case is defined as applying the usual area rotation guidelines developed under Amendment 10. According to these guidelines, an access area would re-open to fishing after closure with annual mortality targets specified such that the average annual mortality since the closure averages 0.20, which is 20% below F_{max} . If an area were re-opened as a 3-year access area, following a 3-year closure, the first year's mortality target could be 0.32, which equates to an allocation of 9 trips for the ETA for full-time vessels in 2007. Thus, the proposed action is a more conservative approach and is therefore deemed to be precautionary.

3.1.4.2 Re-opening date

The Council determined that the Elephant Trunk Area should re-open early on January 1, 2007, rather than on March 1, 2007 as planned under Amendment 10. The preferred alternative is described in more detail in Section 3.3.1.4.2.

Rationale: The Council also considered an earlier opening in late 2006, but there was concern that lower meat yields during and shortly after fall spawning in 2006 would sacrifice yield by not allowing the scallops to grow and overshoot the mortality target because the fleet would catch more scallops to catch the TAC. Although a January 1, 2007 opening would miss growth that occurs during the spring, it would begin fishing after the scallops have recovered from spawning⁵.

The proposed action would spread out effort over time to prevent high levels of shucked scallops from collecting on the bottom in a short period, increasing biological oxygen demand. Furthermore, opening the area in January will have positive economic effects by providing vessels more flexibility about when to fish, reducing the effects of a shorter season on prices and fishing costs.

3.1.4.3 Seasonal closure to potentially reduce sea turtle interactions in the Elephant Trunk Area

During the 2007 fishing year, the ETA would be closed to scallop fishing for a two month period (September 1 - October 31) to possibly reduce sea turtle interactions during a period when takes of loggerhead turtles were observed in 2003 and 2004.

Rationale: As with the other areas in the Mid-Atlantic, the seasonal distribution of sea turtles overlaps with the prosecution of the scallop fishery in the Elephant Trunk Area. Although effort will be controlled by the allocation of five trips in 2007, the Council approved a seasonal closure from September 1 to October 31 as a precautionary measure to mitigate the potential for interactions in the context of rotational area management.

During 2003 and 2004, nine of the twelve sea turtle interactions in the areas now defined as ETA were taken during the months of September and October. This alternative would close the redefined ETA when the majority of turtle catches were observed over the last two years, and minimize the potential economic impacts of a longer closure. Seasonal access restrictions can have negative economic effects and consequences for safety by reducing fishermen's flexibility in choosing when to fish and by increasing the costs of fishing. A proposed rule to require chain mats is currently under review by NMFS and may provide further protection for turtles throughout the Mid-Atlantic region if the gear modification is required on scallop dredge vessels from May through November each year.

3.1.5 Procedures to adjust ETA allocations to account for uncertainty in 2007 ETA biomass estimated

The Council approved a rulemaking process that would allow the Regional Administrator to adjust allocations in the ETA based on updated biomass projections. The procedure is described in Section 3.3.1.5. If biomass estimates are lower than projected, the number of access trips can be reduced quickly using event-triggered rulemaking. The Council approved this procedure for reductions in trips only, intended to be used when the initial five trip allocation would cause the fishing mortality to exceed

⁵ Scallops typically lose meat yield as it converts more energy into gonadal development. Meat yields typically recover in the month or two after spawning.

the $F=0.32$ target. If updated biomass estimates are higher than originally projected, the number of ETA trips would remain the same, allocations would not increase.

Rationale: In general, the preferred alternative would allow adjustments to be made more quickly to ensure that the ETA allocations do not cause overharvesting. This type of change might otherwise take six months to a year to make.

3.1.6 Delmarva (DMV) area rotation closure

High numbers of small scallops from the 2003 year class were observed by the 2005 survey in many stations in the proposed Delmarva rotation area (See Map 5 and Table 25 for coordinates for the proposed closure). Under the proposed action, the area would close in 2007 when the Elephant Trunk area opens (January 1, 2007). The Delmarva area would remain closed for three years until 2010 when the small scallops have grown sufficiently to be harvested. Under the proposed action, the DMV Area would re-open to fishing on February 28, 2010, but a future framework adjustment would define how it would be managed as a controlled access area, once the resource condition at that time can be predicted. Section 3.3.1.6 describes the proposed action in more detail.

Rationale: Closing Delmarva would ensure the continued success of the Scallop FMP by maintaining a high yield per recruit and productivity from the strong year class of young scallops that have been found in that area (south of ETA). Closing this area is expected to boost landings by 15% during 2007-2014 (encompassing the likely duration of closure and rotation area management). Closing the area is also expected to increase the landings of more valuable scallops (less than 10 meats per pound) by 180%. Furthermore, this alternative prevents the entire Mid-Atlantic from being closed at the same time, because the closure would occur when the ETA opens to fishing. The economic impacts are estimated as being negative in 2007 because the area would be closed, but slightly positive over the long-term (2008-2019). Closing Delmarva starting in 2007 could have negative economic impacts on some vessels which mainly fish from NC and VA, by narrowing the fishing grounds they could use for their open-area days, but some of these negative economic impacts would be mitigated by the re-opening of the Elephant Trunk area in 2007 where vessels would be able to take five trips. Some vessels may increase their allotment of ETA trips by trading 2006 and 2007 Georges Bank trips for ETA trips, under the proposed action.

3.1.7 Open area management

The open area DAS allocations are set annually and adjusted every two years to achieve optimum yield at the target fishing mortality ($F=0.2$) for the total scallop resource. Since the formula also includes the mortality in controlled access areas, the open area DAS allocations depend on what controlled access area management TACs are approved. This framework analyzed 10 options with different combinations of GB access areas, access into ETA, access into Hudson Canyon, and whether or not the Delmarva area would be closed in 2007. Table 26 compares the different options that were considered. The total number of fleet open area DAS is contingent on what the Council selects for each of the access areas.

Based on the rotation area management decisions (see Sections 3.3.1.2 through 3.3.1.6) made at the final meeting, the Council approved 20,000 open area DAS⁶ as the proposed action. The specifications associated with 20,000 open area DAS translates based on the number of permits issued into 52 DAS for full-time vessels in 2006 and 51 DAS in 2007. Part-time vessels would be allocated 21

6 This value is measured in terms of DAS use to achieve landings equivalent with the target mortality. Allocations to vessels take into account the number of permitted vessels that use DAS, as well as the proportion of allocated DAS that vessels actually use. The PDT applied the 2004 DAS results to estimate the specifications (see Section 5.???)

DAS in 2006 and 20 DAS in 2007, and occasional vessels would receive 4 DAS for both years. Some of the effort included in this alternative to achieve optimum yield includes general category vessels targeting scallops in open areas. The effort equivalent deducted from the total 20,000 DAS for the general category fleet was about 3,500 DAS. IN addition, this action continues the set-aside program that deducts one percent of allocated DAS to help fund observers, and two percent to fund scallop-related research. The DAS set-aside annually for observer and research are 165 and 330, respectively (See Table 28)

Rationale: While evaluating how many open area DAS should be allocated, the Scallop PDT considered various aspects of the fishery, resource, and ecosystem. The PDT recommended that in order to achieve optimum yield the open area DAS allocations should not exceed 20,000 DAS whether or not the Delmarva area is closed to fishing in 2007, or whether or not the Hudson Canyon area remained classified as a controlled access area in 2006 and 2007. Although more DAS could be allocated to achieve an overall $F=0.20$, higher open area DAS use is expected to cause overharvesting of the open areas, causing a loss in long-term yield from areas not under rotation area management.

The Council agreed with this recommendation not to allocate more than 20,000 DAS, and selected “FW 18 rotation – 20K DAS“as the preferred alternative.

3.1.8 Limited access crew limits

Vessels with limited access permits may carry no more than 7 persons, a measure that was implemented to control the fishing power of a vessel on a DAS. Even though scallop possession limits apply in access areas, this measure has decreased the amount of actual fishing time per DAS and reduced the incentive to target smaller scallops which may be more abundant. On the other hand, the crew limit also increases fishing costs by reducing efficiency per DAS and unnecessarily extending the length of controlled access area trips. The Council decided to eliminate the 7 person crew limit (5 for small dredge vessels) on controlled access area trips (Section 3.3.3.1). Under the preferred alternative, limited access vessels on a controlled access area trip would have no limit on the number of crew onboard.

Rationale: Lifting the crew limit will not affect the total weight of scallops that may be landed. As long as the size of scallops in the controlled access area remains constant the number of crew will have no effect on the weight of scallops that are cut and landed. There exists a potential that vessels with no crew limit could target smaller scallops in access areas as catches of larger scallops decline. Larger crews also have an effect on cull size, which may cause the number of shucked scallops to increase for 18,000 lbs. of landings. Both effects could cause fishing mortality to increase. If large scallops remain abundant in the access area, these effects will however be minimal.

Having no crew limit will give fishermen the most flexibility, potentially reducing total fishing costs, increasing total benefits for crew and vessel-owners, but reducing income per crew member. Increasing crew limits could improve safety and provide more opportunities for new recruits and shackers.

3.1.9 Trip exchange deadline

Under this proposal, vessels would be allowed to exchange controlled access area trip allocations at any time during the fishing year, with proper notification of an approval by NMFS. The exchange program was established in Amendment 10 to mitigate impacts caused by allocating trips to areas that are distant or normally not fished by some vessels. Amendment 10 required that transactions be completed within 90 days of when allocations were made, but when the administration was initiated it proved to be

unnecessary for adequate monitoring and compliance. Therefore, the Council proposes to eliminate the June 1 deadline (Section 3.3.4.1).

Rationale: Eliminating the deadline would provide more flexibility for vessel owners and fishermen to respond to changing resource conditions and economic factors, allowing them to reduce fishing costs as well as business and safety risk. This measure is administrative and is not expected to have impacts on the scallop resource, EFH or protected species.

3.1.10 Controlled access area trip exchanges

As in the status quo, exchanges must occur between vessels of like permit categories because of differences in the scallop possession limit and due to differences in relative fishing power of vessels in different permit categories.

Vessels are allocated controlled access area trips to fish up to the maximum number designated for each area that is open to fishing during a fishing year. A vessel with a one trip allocation may fish in any area when it is open for vessels to take controlled access area trips. There is no need for this vessel to exchange trips, unless the fishermen want to fish in the HCA area, which in 2006 and 2007 technically has a maximum trip limit of zero, with an exemption for vessels that have not used their 2005 HCA allocation.

A vessel with two allocated trips may fish them in any area whose limit is two or more trips, or may split them between two areas. If fishermen want to fish more in one area and less in another, two vessels in the same permit category may exchange the trips such that each vessel may fish two trips in the preferred area and zero trips in the other area. Table 24 provides a concrete example of the maximum number of trips in each area apply after an exchange of trips for areas designated by Framework 18 for controlled access.

Whereas the status quo allowed exchanges to occur between any controlled access area open to fishing during the same fishing year, Framework 18 liberalizes this policy to minimize the potential effects of not having a controlled access area in the Mid-Atlantic region during 2006. The exchange program would be expanded to allow for trading using unfished Hudson Canyon Area trips from 2005 during either 2006 or 2007. It would also be expanded to allow trading of 2006 Georges Bank access area trips and 2007 ETA trips. Exchanges of 2007 ETA trips and 2005 HCA unused trips or any area and 'open' area DAS would not be allowed. The table below gives a summary of the type of trades and whether they would be permitted by Framework 18 in 2006 and 2007.

Table 2. Examples of proposed permissible and prohibited controlled access area trip exchanges.

Allocation and area A	Allocation and area B	Allowed?	Alternative or Rationale
2006 NLSA	2006 CA2	Yes	Status quo, Section 3.3.5.4
2007 ETA	2007 CA1	Yes	“
2006 CA2	2007 ETA	Yes	Section 3.3.5.1
2006 CA2	2005 HCA	Yes during 2006, if the 2005 HCA trip was not fished.	Section 3.3.5.3
2007 CA1	2005 HCA	Yes during 2007, if the 2005 HCA trip was not fished.	“
2007 CA1	2005 HCA	“	“
2006 CA2	2007 CA1	No	Inter-annual exchanges of trips within the same region does not address regional effects caused by area rotation
2005 HCA	2007 ETA	No	“
2006 HCA, 2007 HCA, 2006 ETA	Any area	No	Trip allocations for these areas and years are not approved
2006 CA2	2006 open DAS	No	Section 3.3.5.2; potential changes in fishing power and scallop mortality

Rationale: The one-to-one exchanges for access area trips will not affect scallop mortality, or the amount and distribution of fishing effort. The same amount of fishing effort occurs in each area in each year, but there is a different group of vessels fishing in a particular area after the exchanges occur. For one of the alternatives that exchange trips between years, a vessel relinquishing a 2006 Georges Bank trip in exchange for a 2007 ETA trips would experience a short-term loss. This loss, however, may be compensated as part of the exchange. Trip exchanges provide greater flexibility to vessels regarding which areas to fish, thereby reducing fishing costs and improving safety.

3.1.11 Broken trip exemption program

The broken trip exemption program allows vessels that return to port on a controlled access area trip to catch the remaining portion at a later date on a compensation trip. Framework Adjustment 17 liberalized the program to remove the disincentive that was formerly associated with the formula that determined how much scallops could be landed on a compensation trip. Compensation trips must be taken within the same fishing year, which may increase safety and business risks near the end of a fishing year. The Council recommends as the proposed action a 60-day carry forward provision to reduce business and safety risks. This alternative would authorize landings for broken trips that occur during the last 60 days of seasonal or year-round access to a controlled access area to occur during the first 60 days when the same area is open the following year. If the area does not re-open the following year, the compensation trip cannot be carried forward.

The Council did approve an additional reporting requirement for broken trips. The addition would establish an identification number for each compensation trip issued in response to a broken trip. Vessel owners would be required to enter a trip-specific identifier in their VMS as part of their trip declaration on a compensation trip. The identification number would be included on compensation trip

letters along with appropriate instruction. The identifier will enable NMFS to track original compensations trips and compensations trips for “Broken-Broken trips.”

Rationale: This alternative would liberalize the broken trip program, reducing risks associated with trips taken at the end of a fishing year, or seasonal access program. This alternative would have positive impacts on vessels by reducing any revenue loss if the compensation trips could not be taken at the end of the same fishing year due to weather and other factors. The proposed measure is very similar to the existing open area DAS carry forward regulation and is likely to have minimum biological effects over the long term; however, the short-term effects may need to be considered during framework adjustments that re-specify future TACs.

3.2 Comparison of Alternatives with No Action and Status Quo

In many cases, No Action and Status Quo alternatives are the same, i.e. a continuation of current management regulations. In Framework 18, however, there is a distinction between No Action and Status Quo alternatives in some sections of the alternatives described below. This distinction applies to the scallop area rotation management and open area DAS allocations. In all other cases, the alternative labeled as “Status Quo” is the same as taking no action.

3.2.1 No Action

In the alternatives for area rotation management and for open area DAS allocations, “No Action” is exactly what it implies. It means the measures and allocations that are specified in the present regulations (CFR §648, Sub-part D). If the Council took no action, full-time limited access scallop vessels would receive an allocation of 67 open area DAS in both 2006 and 2007. Part-time and occasional vessels would receive a pro-rata share of 40% and 1/12th, respectively. In addition, full-time vessels would receive an access area allocation of two trips and 24 DAS to fish in Closed Area I and the Nantucket Lightship Area, with a 40% and 1/12th pro-rata share going to part-time and occasional vessels. Thus, the total DAS allocation for a full-time vessel would be 91 DAS in 2006 and 2007 (Table 3).

The TACs would remain as estimated in Amendment 10 and Framework 16/39. When Georges Bank access areas close due to yellowtail flounder catches, vessels would receive up to 24 extra open area DAS, 12 for each access area trip not taken due to the closure. And in 2007, the allocations from the most recent fishing year (i.e. 2006) would continue if the Council and NMFS failed to undertake and approve a biennial framework adjustment. Consistent with “No Action”, the Hudson Canyon Area and the Elephant Trunk Area would re-open for fishing by vessels using open area DAS.

3.2.2 Status Quo

In contrast, the “Status Quo” alternative is a set of measures that achieve the prescribed fishing mortality targets in Amendment 10. It allows for a change in specifications to achieve the stated plan objectives, consistent with achieving optimum yield. The PDT has interpreted this to mean the existing area rotation schedule for 2006 and 2007 to achieve the target mortality (F=0.20) and either 67 open area DAS or open area DAS to achieve the target mortality (F=0.20). In 2006, the calculations show that this policy would mean a full-time allocation of 67 DAS in 2006 and 62 DAS in 2007.

The projections also show that the re-calculated TAC consistent with an F=0.20 target would allow for an allocation of three access area trips, or 36 DAS in 2006 (1 trip in Closed Area I, and 2 trips in the Nantucket Lightship Area). The projections also show that the re-calculated TACs in 2007 would

allow for a three trip access area allocation, two trips in Closed Area II and one trip in the Nantucket Lightship Area.

In addition, the status quo would treat the Elephant Trunk Area as a re-opened controlled access area, consistent with the area rotation policy that the Council approved and adopted in Amendment 10. The PDT has interpreted this policy to mean that the Elephant Trunk Area would re-open to fishing in 2007, with a TAC consistent with time-averaged fishing mortality for a three year rotation plan (F=0.32 in 2007). Projections of scallop biomass based on the 2004 survey data show that the TAC would be sufficient to allocate 9 full-time trips (72 DAS) for the Elephant Trunk Area, with a pro-rata share going to part-time and occasional vessels. Under the status quo, there would be no set-aside or limit for vessels fishing under general category rules, but a three percent set-aside would apply for funding scallop related research and observers. Thus, the total DAS allocation for a full-time vessel would be 103 DAS (67+36) in 2006 and 206 (62+36+108) DAS in 2007 under a status quo alternative.

Like No Action, described above, the regulations under the status quo would allow vessels to receive up to 24 open area DAS when Georges Bank areas close due to yellowtail flounder catches, 12 DAS for each unused trip. A two-percent set-aside would apply for vessels fishing in the Georges Bank access areas but like the Hudson Canyon Area, the Elephant Trunk Area would be open for vessels fishing under general category rules. A two-percent set aside for funding scallop related research and a one percent set-aside to fund an observer program would apply to all access areas, including the Elephant Trunk Area.

Table 3. Comparison of allocated DAS for full-time vessels under the No Action and Status Quo Alternatives

		No Action	Status Quo
2006	Open area DAS	67	67
	Access Area DAS	2 trips (12 DAS in CAI and 12 DAS in NLSA)	3 trips (12 DAS in CAI and 24 DAS in NLSA)
	Total DAS	91	103
2007	Open area DAS	67	62
	Access Area DAS	2 trips (12 DAS in CAI and 12 DAS in NLSA)	3 trips on GB (24 DAS in CAII and 12 DAS in NLSA) 9 trips in Elephant Trunk (108 DAS)
	Total DAS	91	206

3.2.3 Comparison of Alternatives considered in Framework 18 with No Action and Status Quo

With respect to area rotation and open area DAS management, the proposed alternatives would change the order of rotation and the fishing mortality targets for the Georges Bank access areas, extend

the restriction on fishing in the Hudson Canyon Area with open area DAS (allowing vessels with 2005 access area trips to postpone taking them until 2006 and 2007), reduce the Elephant Trunk Area fishing mortality target as a precaution against a potential biomass overestimate, establish new rules for controlled access for the Elephant Trunk Area, create a new rotation area closure, and set open area DAS to achieve optimum yield (possibly reducing the fishing mortality target below $F=0.20$). Total DAS allocations under the alternatives vary according to the proposed measures.

In addition to the area rotation and DAS allocations alternatives, other ones are proposed to make changes to general management measures that apply to vessels with limited access and general category permits. These include adjusting the crew limit on controlled access area trips by limited access vessels, elimination of the controlled access area trip exchange deadline, measures to facilitate controlled access area trip exchanges in 2006 (when there are no Mid-Atlantic controlled access areas open to fishing), an adjustment to the broken trip exemption program to accommodate trips taken at the end of a fishing year, and adjustments to the research set-aside program.

Table 4 outlines and compares the No Action alternative and the Status Quo alternative with other alternatives under consideration for approval in Framework 18. The primary difference between Status Quo and No Action is the number of area access trips, which changes the total number of DAS allocated, as well as the number of open area DAS in 2007 (SQ is slightly lower).

Table 4. Comparison of No Action, Status Quo, and other Framework 18 alternatives

Measure and section reference	No Action	Status Quo	FW 18 alternatives under consideration
Area rotation and trip allocations - 2006 (Section 3.3.1.2)	Two access area trips (one trip each in CA I and NLSA)	Three access area trips (one CA I and two NLSA)	Five access area trips (one CA I, two CA II, two NLSA)
Open area DAS - 2006 (Section 3.3.2)	67 full-time DAS; total allocation 91 DAS	67 full-time DAS; total allocation 103 DAS	46 to 84 full-time DAS, depending on alternative; 52 DAS preferred; total allocation 112 DAS preferred
Area rotation and trip allocations - 2007 (Section 3.3.1.2)	Same as above, according to regulations	Twelve access area trips (two CA II, one NLSA, nine ETA); no new rotation closures	Seven access area trips (one CA I, one NLSA, five ETA), closure of new DMV area
Open area DAS - 2007 (Section 3.3.2)	67 full-time DAS; total allocation 91 DAS	67 full-time DAS; total allocation 206 DAS	45 to 78 full-time DAS, depending on the alternative; 51 DAS preferred; total allocation 136 DAS preferred
Effort transfers for unused trips when GB access areas close due to yellowtail flounder catches (Section 3.3.1.2.4)	Up to 24 DAS may be added to a vessel's open area DAS allocation, 12 DAS for each unused trip at the time an area closes.		Additional open area DAS allocated upon area closure based on a pre-defined rate (preferred)
Hudson Canyon Area management policy (Section 3.3.1.3)	HCA re-opens to fishing on an open area DAS on March 1, 2006.		Restricted access extended until March 1, 2008, unused trips and TAC carried forward from 2005.
ETA re-opening (Section 3.3.1.4)	March 1, 2007		January 1, 2007

Measure and section reference	No Action	Status Quo	FW 18 alternatives under consideration
ETA seasonal closure (Section 3.3.1.4.3)	Area remains open year-around		Seasonal closures between July 15 and November 14 to protect sea turtles and minimize bycatch mortality.
Corrections to 2007 ETA trip allocations (Section 3.3.1.5)	Must use a framework adjustment to be completed, approved, and implemented by January 1 or March 1, 2007.		The Regional Administrator may adjust ETA trips based on 2006 survey estimates of total exploitable biomass.
Limited access crew limits (Section 3.3.3)	Seven person maximum for vessels with large dredges and five person maximum for vessels with small dredges		Crew limits may be lifted entirely or increased to eight persons on controlled access area trips.
Trip exchange deadline (Section 3.3.4)	All exchanges of controlled access area trips must be completed by June 1, or within 90-days of when final rules allocate trips		Trip exchange deadline may be eliminated.
Controlled access area trip exchanges (Section 3.3.5)	Limited access vessels may exchange 2006 trip allocations, which in 2006 only include CA I, CA 2, and NLSA for any alternative. Vessels may exchange access area trips in 2007, including GB and ETA trips.		Vessels may exchange trips between areas, including exchanges of 2006 GB area trips and 2007 ETA trips or unused 2005 HCA trips (both preferred); Vessels may exchange GBx area trips for open area DAS based on a pre-defined ratio (non-preferred)
Broken trip exemption program (BTEP) (Section 3.3.6)	All BTEP compensation trips must be initiated before the end of the fishing year and may not be carried forward.		Broken trips that occur within 60 days of the end of a fishing year may be resumed via a compensation trip during the first 60 days of when the same area opens during the next fishing year.
Research set-aside program (Section 3.3.7)	Research is funded through annual set-asides and the research compensation must be concluded by the end of the fishing year. Unused set-asides are not re-allocated or banked.		Changes would allow for funding of multi-year projects; dispose of unused set-aside through banking, secondary RFAs, or revised fleet allocations; dedicate funding for cooperative industry surveys, and allow combined research/compensation trips in closed scallop areas

Measures that will be in effect March 1, 2006 until Framework 18 is Implemented

In the case where the Council and NMFS do not approve fishery specifications, Amendment 10 and Framework 16/39 specified default allocations for the 2006 fishing year. Normally the previous year's allocations [see CFR §648.53(d)] and management measures would continue to be in effect until the plan is amended by a framework action. In this case, however, Amendment 10 anticipated that the Hudson Canyon Area would no longer be suitable to continue as a controlled access area and the fishing effort there should be pooled in the open area DAS allocations. In addition, Framework 16/39 established a three year cycle for access to portions of the groundfish closed areas, 2006 being the third year of a rotation cycle. Anticipating these differences, Amendment 10 set the default 2006 full-time DAS

allocations to 67 DAS and allocated one trip per vessel to each of the Nantucket Lightship Area and Closed Area I.

Implementation of this framework adjustment is expected to occur after the beginning of the 2006 fishing year. During this delay in implementation the management measures would be the same as those under the No Action alternative (described in Section 3.2.1. In the short term, the delayed implementations will not harm the resource or fishery. Initially, No Action would allocate more effort in the open areas and not enough to the Georges Bank access areas. At first, Mid-Atlantic trips could be exchanged for the Georges Bank area trips, but the Georges Bank areas do not open until June 15, 2006 anyway. Table 5 summarizes the No Action provisions that could apply at the start of the 2006 fishing season, and compares them to potential actions under Framework 18.

According to the current regulations, NMFS would allocate 67 full-time open area DAS (and part-time and occasional DAS on a prorata basis) on March 1, 2006. In addition, vessels would be allocated one trip to fish in each of the Closed Area I and Nantucket Lightship Area access areas, beginning on June 15, 2006. Under the default allocation, DAS used between March 1, 2006 and implementation of Framework 18 would be counted against the final 2006 allocations under the framework adjustment.

The Elephant Trunk Area would remain closed until March 1, 2007 and the Hudson Canyon Area would revert to an open area status on March 1, 2007. Vessels on a limited access DAS could carry no more than 7 persons as crew and the vessel must use gear with rings no less than 4" diameter and twine top mesh no less than 10". Vessels having broken trips would be authorized to take compensation trips before the end of the fishing year and 2006 trip exchanges between vessels must be completed before June 15, 2006. Vessels may exchange Nantucket Lightship Area and Closed Area I trips, so that each vessel would be authorized to take two trips in one area or the other.

The impacts of the No Action alternative are analyzed in Section 5.0 and continuation of No Action for a short period before implementation of Framework 18 regulations would have marginal and intermediate effects, compared to the long term analysis of no action. The distribution of effects would be the same as those analyzed in Section 5.0 in that No Action allows for more DAS in open areas and fewer DAS on controlled access area trips in 2006. Thus, the conservation measures in Framework 18 would be slightly less effective than analyzed in the open areas, but only if vessels use more than 52 DAS before Framework 18 is implemented.

According to the biological projections, the 2006 fishing mortality rate is forecast to be 0.13 under no action vs. 0.14 for the Framework 18 preferred alternative. Open area DAS are of course higher (24,022 for No Action vs. 19,324), but there is a slight increase in total DAS for the Framework 18 preferred alternative because it allocates three additional Georges Bank access area trips during 2006. Overall DAS in 2006 for No Action (35,399) are slightly lower than the Framework 18 preferred alternative (38,287). Due to the distribution of effort, however, the 2007 biomass for No Action (10.9 kg/tow) is forecast to be somewhat lower than that for the Framework 18 preferred alternative (11.1 kg/tow).

The projections using 2004 survey data estimate that about 3,100 open area DAS would be applied by the fishery in the Hudson Canyon Area, but this is an overestimate because the 2005

7 Amendment 10 anticipated that after managing the Hudson Canyon Area by controlled access and increasing fishing mortality targets for five years under area rotation, the surplus biomass from the 1998-2000 closure would have been caught and the area should revert to an open area status until a new strong year class of small scallops occurs there.

preliminary survey data indicates that the Hudson Canyon Area biomass is much lower than previously estimated it would be using these projections. The projections estimated that 2005 Hudson Canyon Area biomass should have been 6.51 kg/tow after accounting for the catches made in 2004-2005, but the 2005 preliminary biomass level came in at 2.49 kg/tow, a reduction of 62%. Assuming a linear relationship between LPUE and total biomass⁸, the catch in 2006 could be as low as 700 pounds per day. The 2004 projections for other open areas were comparable to the preliminary 2005 data and the estimated catches in 2006 were 1500 lbs./day in the NY Bight South subregion, 1,750 lbs./day in the Delmarva sub-region and 1,740 lbs./day in the South Channel sub-region. Thus in 2006, it would be very unlikely for the fleet to use open area DAS to fish in the Hudson Canyon Area, except possibly in select portions where the catch rates approached the levels the vessels would experience in other open areas.

This analysis suggests that although a delay might allow too much fishing effort in the open areas and negatively effect scallop revenues and benefits, the long-term implications of postponing Framework 18 are very marginal, particularly if most vessels use no more than 52 DAS in the open areas before implementation of the framework adjustment. It is possible that more vessels will take their 2005 Hudson Canyon Area trips during this fishing year rather than postponing them until 2006 or 2007. If this fleet response occurs, it would thus take longer for the biomass in the Hudson Canyon Area to recover from the excess TAC and trip allocations in 2005.

Table 5. Comparison of management measures contemplated in Framework 18 and No Action which could apply at the start of the 2006 fishing year.

Management measure in Framework 18	Potential Framework 18 actions for 2006	No Action⁹	Ramifications of No Action	Effects on scallop mortality, conservation, and the fishery
Open area DAS allocations	52 full-time 21 part-time 4 occasional	67 full-time 27 part-time 6 occasional	DAS used prior to FW18 would be deducted from final allocations	No effect unless vessels use more than 52 DAS before final rules apply.
Georges Bank area access	CA I – 1 trip CA II – 2 trips NLSA – 2 trips	CA I – 1 trip NLSA – 1 trip	Initial allocations would increase by three trips, one in each area	More conservation for scallops and bycatch due to fewer access trips, so negative effects on the fishery, but only after June 15, 2006.
Hudson Canyon Area	Restricted access for vessels to fish with 2005 trips carried forward	Area available for fishing on open area DAS	Low LPUE make fishing open area DAS in the HCA unlikely. Vessels could take unused 2005 trips in the HCA once FW18 approved	Negative effect on conservation if vessels take 2005 trips before the HCA becomes an open area on March 1, instead of postponing trips to 2006 or 2007.
Elephant Trunk Area	Area opens for five controlled access area trips on Jan. 1, 2007	Area remains closed to fishing through Mar. 1, 2007	No differences before Jan. 1, 2007	No effect before Jan. 1, 2007
Delmarva Area	Area closes to fishing on Jan. 1, 2007	Area available for fishing on open area DAS.	“	“

⁸ This assumes that scallop size frequency is the same as what the projections estimated and that the relationship between exploitable and total biomass remains constant.

⁹ i.e. Continuation of current regulations without a framework adjustment.

Management measure in Framework 18	Potential Framework 18 actions for 2006	No Action ⁹	Ramifications of No Action	Effects on scallop mortality, conservation, and the fishery
Limited access crew limits on controlled access area trips	8 person limit on controlled access area trips or elimination of the crew limit	7 person limit on all trips	Vessels continue to use no more than 7 persons on all trips	Slight negative effect on the fishery, but no effect on conservation.
Trip exchange deadline	None	June 1, 2006	No difference until June 1, 2006	“
Controlled access area trip exchanges	Broader array of options available, particularly for vessels based in the Mid-Atl.	Only exchanges of CA I and NLSA trips possible.	More options become available when FW18 is approved.	“
Extension of broken trip compensation deadline	Compensation for broken trips in the last 60 days of the FY must be completed by 04/30/07(later for GB)	Compensation trips must be completed before end of fishing year.	No differences until Mar. 1, 2007.	No effect in 2006.

3.3 Description of Non-selected Alternatives Considered and Analyzed, as well as the Proposed Action

This section describes all the alternatives considered and analyzed in this action. The proposed measures have already been summarized in Section 3.1, but the full description and rationale of the proposed measures has been left in this section so they can be compared with the other alternatives considered. Each proposed measure is identified as *proposed*.

3.3.1 Area Rotation Measures and Allocations

This section briefly describes the various area rotation measures considered in this action including measures for Georges Bank, Hudson Canyon, Elephant Trunk, and Delmarva. The alternatives for each area are described in more detail in Section 3.1.2 through Section 3.1.6.

Area rotation management was formally adopted by the Council in Amendment 10, as a means to enhance yield from the scallop fishery. Initially the controlled access area programs were developed through previous framework adjustments, but improved and adopted as a primary management tool in Amendment 10. Periodic adjustments are needed to respond to changing resource conditions and the appearance of new recruitment. The purpose of the proposed alternatives in Framework Adjustment 18 are therefore to make these needed changes and improve yield while reducing environmental effects by keeping fishing time per DAS low.

The Elephant Trunk Area has been closed to scallop fishing since July 2004 and by 2007 the scallops are estimated to be of optimum size for scallop fishing. If no action is taken, the Elephant Trunk Area would re-open for scallop fishing as a fully-open fishing area. Without limiting the number of trips that a vessel may take, the forecasts show that nearly all of the open area DAS would be used on trips in the Elephant Trunk Area, with very high concentrations of fishing activity in a relatively small area. Landings would spike and the fishery would have adverse effects on scallop prices and on the environment. The framework adjustment would limit trips and scallop mortality in the Elephant Trunk Area in a way that produces optimum yield over the long term.

The proposed action would establish a TAC associated with a fishing mortality target of 0.16, half of the Amendment 10 fishing mortality target for the first year of a rotation area management opening. This approach is proposed because of the imprecision of estimates made from the 2004 survey, when the abundant scallops were small and imprecisely estimated. The 2005 survey data is not yet available for this type of analysis and 2006 surveys will provide a much more precise estimate of the amount of biomass that will be available in 2007. Due to the length of time it requires to prepare a framework adjustment, the proposed action recommends adjusting the 2007 Elephant Trunk Area trip allocations through an abbreviated regulatory process, which will rely on triggers to determine when and how the Regional Administrator should make changes of the Elephant Trunk Area trip allocations, or if necessary the open area DAS allocations to prevent localized overfishing and achieve optimum yield.

Scallop biomass in the Hudson Canyon Area is much lower than forecast in Amendment 10, which set TACs and trip allocations for 2004 and 2005. As a result, the fishing mortality in the area is expected to be much higher than the target and catch rates are much lower than forecast. If the number of trips taken in 2005 is reduced and unused trips carried forward until 2006 and 2007, it would allow time for growth and recruitment to replenish the scallops that remain (proposed action). Since some vessels have already taken the three allocated trips for 2005 and some have taken none, the only equitable way to correct the situation is to allow vessels that have unused trips to take them at a later time when the catch rates recover. Closing the area in 2005 would cause the vessels to take their unused trips before the closure, driving up fishing mortality and reducing yield that could otherwise be higher if the trips are taken in 2006 or 2007. During 2006 and 2007, the Hudson Canyon Area would be classified as a restricted fishing area where only vessels with remaining 2005 trips could fish.

High abundance of two-year old scallops were newly observed in an area south of the Elephant Trunk Area during the recently-completed 2005 survey. The PDT examined the distribution of tows having large numbers of small scallops and recommended closure of an area encompassing the scallops. Since these scallops will not become vulnerable to scallop dredges until early 2007, the PDT recommended closure of a new "Delmarva" rotation management area when the Elephant Trunk Area re-opens to scallop fishing in 2007 (proposed action). These scallops may also become vulnerable to fishing in 2006 by vessels using scallop trawls, a gear that has been demonstrated to retain more smaller scallops at age three. Due to this concern, the PDT recommended closing the new area to scallop fishing in the fall of 2006 if the FMP cannot restrict general category vessels from using trawls to target sea scallops.

Alternatives in this section were considered to achieve optimum yield in fishing years 2006 and 2007. Under special controlled access area programs, TACs are estimated to achieve specific annual fishing mortality targets and trip allocations are made to ensure that landings do not exceed the desired levels. Limited access vessels are allocated an aggregate number of controlled access area trips, with a maximum number that may be taken in each area. Included in the specifications are set-asides to fund scallop research (2%), fund observer coverage (1%), and provide for some access by vessels with general category permits (2%). Trips have a scallop possession limit (and catch limits for other species where applicable). Limited access vessels may exchange controlled access area trips with another limited access vessel in the same category (full-time, part-time, and occasional) to mitigate the costs of fishing areas that are distant or otherwise inaccessible to the vessel.

Adjustments are not proposed in this framework action for area boundaries, Georges Bank access area seasons (June 15 to February 28/29), yellowtail flounder TACs, DAS allocations per trip (12 DAS each), set-asides, and allowances for fishing by general category vessels. The yellowtail flounder TAC is a cap on landings that is 10% of the overall TAC for each stock area (in this case, Georges Bank and Southern New England stocks). These caps automatically adjust whenever the overall TAC is modified in the NE Multispecies FMP. The specifications for the set-asides and allowances for fishing by vessels with general category permits are set as a percentage of the scallop TACs, which are estimated in this

framework adjustment. This document does not change the percentages described above. During 2007, this framework adjustment proposes opening the Elephant Trunk Area as a controlled access area. The same set-asides proportions that apply to the Georges Bank and the Hudson Canyon access areas will apply to the Elephant Trunk Area.

For each set of controlled access area TACs, the open area DAS allocations are estimated that are associated with optimum yield. These may be calculated as the amount of fishing effort that is estimated to produce the annual fishing mortality target for the resource ($F=0.20$), or a maximum amount of effort that will produce optimum yield. Since a significant portion of the scallop resource is closed to fishing (EFH closed areas, Elephant Trunk Area in 2006) or underharvested compared to a level that will maximize yield given the sizes of scallops that exist there (Georges Bank access areas), the open area fishing mortality rates will be higher than 0.24 (estimated to maximize yield-per-recruit) in the open areas.

Specifications: Table 6 and Table 7 show the estimated number of trips and possession limits for the alternatives under consideration, and how they compare to the No Action, Status Quo and Contingency Alternative. The controlled access area allocations are calculated from the individual area TACs and maximum number of trips in each area. Part-time and Occasional allocations are 40% and 1/12th of the amount of total scallops that a full-time vessel could catch and land from the controlled access area. The No Action alternative includes the current area schedule and mortality targets for the Georges Bank access areas, with the Elephant Trunk Area becoming a fully-open fishing area on March 1, 2007. The status quo alternative includes the current area access schedule for the Georges Bank access areas and the Elephant Trunk Area managed as a controlled access area, with an $F=0.32$ target in 2006 and $F=0.40$ target in 2007. The ‘Framework 18’ alternative changes the access schedule for the Georges Bank access areas, each area having a fishing mortality target between 0.20 and 0.30, and manages the Elephant Trunk Area as a controlled access area with precautionary allocations, calculated by applying a fishing mortality rate of 0.16 to the current projection of scallop biomass. The contingency alternative (proposed action) assumes that both EFH closures implemented under Amendment 13 and Amendment 10 apply to scallop vessels, thus the access areas are smaller is Closed Area I and Nantucket Lightship. Therefore, the access area trip in Closed Area I shifts to Closed Area II, same overall number of trips as Framework 18 alternative.

Table 6. Comparison of estimated maximum number of trips for full-time limited access vessels by management area.

	No Action				Status quo		Framework 18 Preferred Alternative		Contingency Alternative (proposed action)	
	2004	2005	2006	2007	2006	2007	2006	2007	2006	2007
Closed Area I	0	1	1	1	1	0	1	1	0	1
Closed Area II	2	1	0	0	0	2	2	0	3	0
Nantucket Lightship	1	0	1	1	2	1	2	1	2	1
Elephant Trunk	0	0	0	0 ¹⁰	0	9	0	5	0	5
Hudson Canyon	4	3	0	0	0	0	0	0	0	0
Total	7	5	2	2	3	12	5	7	5	7

¹⁰ Elephant Trunk Area yield is pooled into the open areas, for purposes of estimating DAS allocations.

Table 7. Estimated controlled access area allocations and possession limits. Controlled access area DAS allocations are 12 DAS per allocated trip for all vessel categories.

	2006		2007	
	Trips	Possession limit	Trips	Possession limit
No Action				
Full-time	2	18,000	2	18,000
Part-time	1	14,400	1	14,400
Occasional	1	3,000	1	3,000
Status quo				
Full-time	3	18,000	12	18,000
Part-time	2	10,800	5	17,280
Occasional	1	4,500	1	18,000
Framework 18 alternative (same as Contingency Alternative) (Proposed Action)				
Full-time	5	18,000	7	18,000
Part-time	2	18,000	3	16,800
Occasional	1	7,500	1	10,500

In addition to various allocations for access areas, this action also considered a range of open area DAS allocations. The controlled access area DAS allocations under the different area management scenarios described in the following sections are presented in the table below.

Table 8. Summary of controlled access trip and DAS allocations under consideration (proposed is shaded).

Scenario	Fishing year	Full-time controlled access areas trips	Full-time DAS	Part-time controlled access areas trips	Part-time possession limit	Part-time DAS	Occasional controlled access areas trips	Occasional possession limit	Occasional DAS
DMV closure - 18K open DAS	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
DMV closure - 20K open DAS 2006-7 (Proposed Action)	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
DMV closure - 20K open DAS in 2006	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
Framework 18 - 15K open DAS	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
Framework 18 - 20K open DAS	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
Framework 18 - 30K open DAS	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
Framework 18 rotation - 24.7K DAS	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
FW 18: 2Yr HCA restriction	2006	5	60	2	18000	24	1	7500	5.0
	2007	7	84	3	16800	33.6	1	10500	7.0
	2007	7	84	3	16800	33.6	1	10500	7.0

No action	2006	2	24	1	14,400	14.4	1	3000	3.0
	2007	2	24	1	14,400	14.4	1	3000	3.0
Status quo	2006	3	36	2	10800	14.4	1	4500	3.0
	2007	12	144	5	17280	57.6	1	18000	12.0

3.3.1.1 Area specific limits on fishing by limited access vessels

Each controlled access area has a TAC that must be allocated amongst vessels that are authorized to fish. The current method, in used since 1999, establishes a scallop possession limit and authorizes each limited access vessels to take a certain number of trips in each controlled access area. Trip allocations per vessel were rounded up or down so that a whole number of trips were authorized. These trip allocations have had some negative effects on safety and on fishing cost. An alternative was considered that would allocate a certain number of pounds that a vessel may land from each controlled access area, allowing fishermen to determine for themselves what the optimum length of trip should be based on existing weather and expected price. This alternative was not selected, the status quo alternative of allocation by maximum number of trips by area with a possession limit was selected as the proposed action.

3.3.1.1.1 Area specific allocation of total pounds per vessel

Vessels would be authorized to harvest the total amount of scallops allocated per vessel in any Access Area. For example, if 2 trips at 18,000 lb were allocated for full-time vessels in CAI, the vessel would have an allocation of 36,000 lb to harvest in as many trips as necessary. Calculation of the allocation would be based on the current method of calculating the possession limit for a given number of DAS based on a pre-determined catch rate (e.g., 18,000 lb for 12 DAS based on a 1,500 lb/DAS catch rate). Vessels could land any amount on a trip provided the total combined scallop landings from all trips during the fishing year do not exceed the total pounds allocated to the vessel. This change in harvest would not affect the trip exchange program, which may be modified in Framework 18 to allow cross-fishing year exchanges. Vessel owners would still be limited to exchanging trips (e.g., exchanging 18,000 lb between full-time vessels). Vessel owners/operators must continue to comply with observer notification requirements, including notifying the observer program no less than 72 hours prior to departure on each trip.

This alternative would modify each of the allocation alternatives to translate allocated trips with associated possession limits to allocated pounds. For example, the alternative presented in Section 3.3.1.2.1 proposes the following trip allocations with an 18,000 lb per trip possession limit for full-time vessels:

- 1 trip in Closed Area I
- 2 trips in Closed Area II
- 2 trips in Nantucket Lightship Closed

Instead, allocations would be 18,000 lb per vessel in Closed Area I and 36,000 lb per vessel in both Closed Area II and the Nantucket Lightship Closed Area.

Allocations of pounds rather than trips in Access Areas will require new reporting for vessel owners and monitoring requirements for NMFS. The following procedures would be implemented in order to effectively monitor individual vessel activity for compliance with the overall allocation for each area.

Scallop Access Area Hail Weight and Trip-end Reports through VMS

- Vessel operators report via VMS the hail weight of scallops on the way in, e.g., after leaving an access area and before the vessel crosses the VMS demarcation line on its return to port to land its catch. The hail weight will assist in determining whether a vessel is in compliance with the possession limit or not, but will not be used as an actual landed weight amount, or to adjust a vessel's landing allowance balance.
- Vessel operator submits "Trip-end Landing Report" through VMS upon completing the landing at a dealer. The report must include VTR serial number (printed on each VTR page) and the permit number of the dealer where the vessel lands its catch.
- Area Access trips cannot be landed at multiple dealers.

Programming and status monitoring

Each Trip-end Landing Report would be used in an accounting program modified from NMFS's current DAS program. Currently, NMFS utilizes an automated system that tracks DAS. This program would be modified to accept information in pounds landed and make appropriate deductions when information is imported into the program. With appropriate funding to implement such programming, the accounting system could be somewhat sophisticated, allowing for real-time balance updates for vessel owners/operators and NMFS, and automated messaging through VMS units of allocation balances for each area. However, at a minimum, the new programming would enable NMFS and enforcement to track individual vessel allocations and balances. Vessel owners would be able to request such information, similar to current procedures for DAS balance inquiries.

The following could be benefits of programming vessel-by-vessel allocations:

- VMS message alerts may be enabled, notifying vessel operators through VMS upon trip declaration to an area of remaining balance. A vessel with zero balance would be notified that it must return to port.
- NMFS (and potentially vessel owners/operators) can check vessel balances at any time through internet-based program.

Enforcement and compliance

Enforcement and compliance checks will focus on a vessel's compliance with the allowed pounds per area. Trip and DAS counting, as well as compliance with broken trip compensation trips, are eliminated. The real-time vessel reporting will enable this necessary shift in compliance.

- Compliance checks could be a combination of real time (system monitoring and dock-side) and post trip cross-checks of vessel and dealer reports.
- Enforcement can check vessel dockside based on hail weight report and prior Trip-end Landing Reports.
- Enforcement can check updated vessel balances to determine compliance upon subsequent hail weights or landing reports.
- Weekly dealer reports will be used to cross check vessel's VMS landings reports.

NOTE: IF THIS PROVISION IS NOT ADOPTED BY THE COUNCIL, NMFS RECOMMENDS ADDING A REPORTING REQUIREMENT FOR THE EXISTING BROKEN TRIP PROVISION. THE NEW REQUIREMENT WOULD ESTABLISH AN IDENTIFICATION NUMBER FOR EACH COMPENSATION TRIP ISSUED IN RESPONSE TO A BROKEN TRIP. VESSEL OWNERS WOULD BE REQUIRED TO ENTER A TRIP-SPECIFIC IDENTIFIER IN THEIR VMS AS PART OF THEIR TRIP DECLARATION ON A COMPENSATION TRIP. THE IDENTIFICATION NUMBER WILL BE INCLUDED ON COMPENSATION

TRIP LETTERS ALONG WITH APPROPRIATE INSTRUCTION. THE IDENTIFIER WILL ENABLE NMFS TO TRACK ORIGINAL COMP TRIPS AND COMP TRIPS FOR “BROKEN-BROKEN TRIPS.”

**Since the Council did not select this alternative for area specific allocation of total pounds by vessel, the above suggestion for a reporting requirement for broken trips was adopted for the existing broken trip provision (See Section 3.3.6).

Rationale: Allocating pounds by area rather than DAS, trips, and possession limit, will eliminate monitoring of the area access program through DAS. The current Area Access Program utilizes a DAS accounting program to monitor trips and vessel by vessel compliance. In consideration of the overall TAC, DAS are used to establish the possession limit based on a projected catch rate per DAS and TAC (e.g., a catch rate of 1,500 lb per DAS equals an 18,000 lb possession limit for full-time vessels for a 12-day trip). Although DAS are monitored through NMFS’s program, the possession limit also requires monitoring for compliance. Since actual DAS are not charged, even if the length of the trip exceeds the DAS charge, and since broken trips no longer are subject to an automatic DAS and possession limit deduction, accounting for area access trips in DAS is nearly meaningless. Revising the system to eliminate the DAS charge and DAS accounting will be more consistent with management of the access areas by possession limit and will eliminate confusion about how to account for trips. Monitoring of broken trips, and broken compensation trips (so-called “broken-broken trips”), has become difficult to administer and will no longer be necessary (issues related to broken trips are discussed below).

Each vessel would be able to fish at their own pace rather than being confined to catching the prescribed per-trip possession limit. This may provide flexibility for smaller vessels that are not capable of catching a per-trip possession limit efficiently, or in situations where catch rates in an area have declined well below the 1,500 lb per day (or other projected catch rate). It would also eliminate the need for the broken trip exemption program because vessels would not need to declare that their trip ended before catching the allowed possession limit. By eliminating the broken trip provision, vessel owners and operators will not need to wait for NMFS to respond to broken trip requests. The added flexibility would allow fishermen to stay out longer under favorable conditions and return earlier when conditions become unfavorable, potentially improving safety.

Because some vessels may take advantage of being able to catch more scallops per trip, there may be a predominance of longer access area trips by large, more efficient vessels. Longer trips, although potentially having a negative effect on meat quality and price, could be less costly for vessels since they may not have to return to port as frequently, thereby reducing some fishing costs. Also, except for the last trip a vessel makes under its landing limit, this form of tracking a vessel’s catch would eliminate the cost associated with the risk of exceeding a possession limit on each trip. Presently, vessels reportedly sacrifice a portion of their allowable landings on access area trips to avoid a potential violation resulting from unintentionally exceeding the possession limit.

Broken trip summary and issues

The revised broken trip provision under Framework 17 eliminated the broken trip penalty and highlights the similarity between the broken trip program and area allocations in pounds. Under the broken trip provision, vessels can break trips as often as necessary in order to efficiently harvest the 18,000 lb limit. Changing the program to allocate scallop pounds and track landings will make monitoring consistent with the area access program and will facilitate administration by eliminating the largely manual administration of the broken trip provision.

During the 2004 fishing year, there were 183 broken trips in the various access areas implemented under Amendment 10 and Joint Frameworks 16/39. From March 1, 2005, through October

2005, there have been 282 broken trips. Although NMFS does not evaluate requests, it does record the reason for breaking trips, which has included injury, mechanical problems, weather, and supply shortages (due to low catch rates). The majority of the broken trips in the 2005 fishing year have occurred in the Hudson Canyon Access Area.

Each request for a broken trip requires NMFS staff to conduct minor investigations into dealer's reported landings to verify the landings reported on the broken trip adjustment sheet as submitted by the vessel owner. In addition, NMFS fishery management staff and enforcement must frequently investigate individual vessel DAS usage issues, particularly in cases where vessels have terminated compensation trips. Further, since the administrative program that tracks area access trips is DAS based and does not record pounds landed, NMFS staff must rely on manually generated spreadsheets and the actual compensation letters to track activity. Without sufficient automation, such a program is susceptible to errors, oversights, communication breakdowns, and delays in responses to vessel owners.

Vessel owners may not resume a trip as compensation for the broken trip until NMFS has verified the landing and has issued a letter to the vessel owner authorizing the compensation trip. As a result, vessels with no remaining full trips must wait at the dock for NMFS approval. Often, vessels must wait in ports other than their home port. This has been a major frustration of vessel owners and operators that prefer to resume trips quickly.

Based on these issues with the broken trip program, elimination of the broken trip provision through the new allocation by pounds would eliminate some of the problems and frustrating administrative issues for both the industry and NMFS. Despite the potential benefits of this measure, the Council does not believe that these benefits currently outweigh the risks identified with this alternative. There are concerns related to monitoring and vessels potentially landing high volumes of poor quality meat if the possession limit restriction is removed.

3.3.1.1.2 Status quo: Maximum number of trips by area and scallop possession limits (proposed action)

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 trip may land up to 18,000 lbs. of scallop meats, or an amount by a part-time or occasional vessel that allows it the opportunity to land 40% and 1/12th respectively of the amount that a full-time vessel may land. Fishing in the controlled access area may be subject to other limits, such as seasons or potential closures due to TACs for yellowtail flounder. The status quo would continue this method of controlled access area management, but the maximum number of trips for each area would be adjusted to make the total amount of trips that may be taken compatible with the estimated TACs to achieve optimum yield.

Rationale: This management system has been in place since 1999 and has successfully prevented vessels from landing high volumes of poor quality scallop meats and from having a significant negative effect on markets. Mechanisms are in place to ensure an adequate level of compliance and systems are in place to provide for satisfactory monitoring and enforcement. In this form of management, only the number of trips must be counted which is accomplished via normal VMS data processing and is quickly summarized for law enforcement to determine whether the vessel is on an authorized trip. Limits on landings are monitored for each trip, i.e. the landings do not have to be monitored for each vessel over the season.

In most controlled access areas, vessels have also been able to catch and process the scallop possession limit in much less than 12 DAS, allowing the opportunity for fishermen to seek out areas where there is less finfish bycatch or more large scallops, even though it may take a bit longer to fish than where there are more finfish or smaller scallops. The system also allows crews to get more rest because

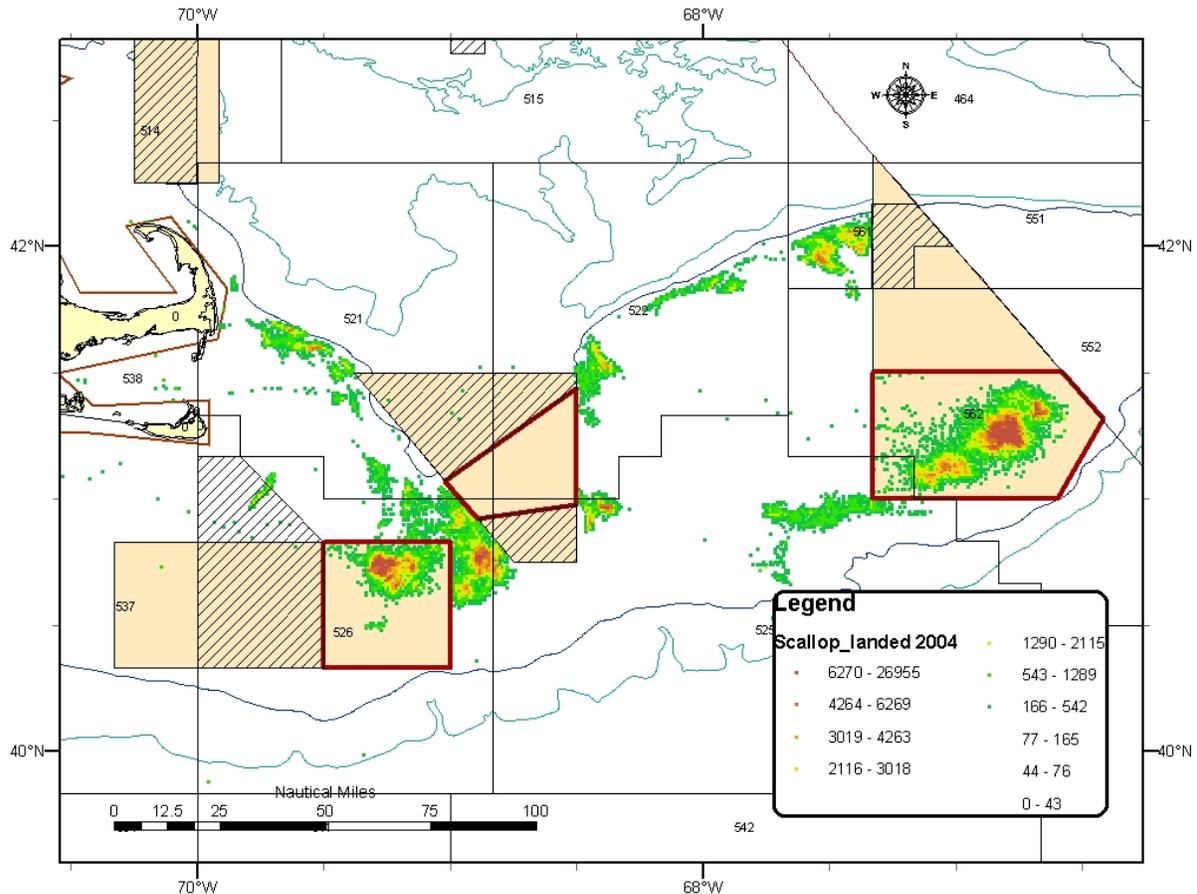
other than added supply costs, it does not cost the vessel precious DAS to fish longer in the controlled access areas.

The 18,000 lb. limit has been sufficient for vessels to make very profitable trips, without forcing or allowing vessels to make longer trips to land greater volumes of scallops. Higher or no possession limits could have negative effects on meat quality (particularly those scallops caught during the first days of a trip), on price (because markets are not well suited to accept large volumes of landings all at one time, depressing the price), and on safety (because the crew becomes more fatigued as the vessel is out longer). In addition, with no possession limit, some vessels will feel compelled to stay out longer than they should to land bigger trips, thereby compromising safety. Changes made in Framework 17 to liberalize the broken trip exemption program may have satisfactorily addressed the safety concerns that arose recently due to the controlled access area management program. See Section 3.1.1 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.2 Georges Bank Area Access Measures

The following alternatives pertain to potential rules that would apply to the Georges Bank access areas (Map 1). These areas are part of the Georges Bank closed areas, which are otherwise closed by the NE Multispecies FMP to gears capable of catching regulated groundfish. Under special circumstances, certain fisheries are allowed to operate in parts of the closed areas on species whose stocks are in relatively healthy condition, in ways that reduce or minimize impacts on other regulated species. Access programs for the scallop fishery were approved for 1999, 2000, 2004, and 2005, which successfully allowed catches of abundant scallops with relatively low impacts on regulated groundfish species, including cod, haddock, and yellowtail flounder (see NEFMC 2004: Framework Adjustment 16/39 for estimates of bycatch in the Georges Bank access areas). On a per DAS basis, the access programs also have very low bottom contact per pound of scallop landed, which helps to minimize the overall impacts on the environment.

Framework 16/39 adjusted the boundaries of the access areas, which were originally established in Framework 11 (NEFMC 1998) and Framework 13 (NEFMC 1999). The boundaries were adjusted to be compatible with new Essential Fish Habitat closures to provide better conservation through long-term closures to bottom-tending mobile fishing gears.



Map 1. Boundaries of Georges Bank Access Areas (outlined in bold), showing the distribution of scallop catches during calendar year 2004. Note: Closed Area I was not open in 2004. From left to right - the Nantucket Lightship Access Area, the Closed Area I access area, and the Closed Area II access area, also showing the location of the Georges Bank groundfish closed areas (shaded) and the EFH closed areas (hatched). These areas are near Georges Bank and the Great South Channel, outlined by 50 and 100 fm bathymetry contours. Scallop landings in 2004 are distributed by the amount of VMS fishing effort on a trip by trip basis.

3.3.1.2.1 Preferred alternative during draft: Revise the Georges Bank Area Access schedule

Limited access and general category vessels would be able to fish in all three access areas in 2006, followed by Nantucket Lightship Area and Closed Area I in 2007. Annual fishing mortality targets would be set between somewhere between 0.20 and 0.30 in order to achieve optimum yield for that area. Each year's TAC and fishing mortality target is adjusted within this range such that the total allocations (including limited access trips, general category trips, and set-asides) total as close to the TAC as possible¹¹. Note that the percent of TAC allocated for each area does not always equal 100%, which is due to the nature of the calculation. Sometimes it is necessary to allocate more than 100% of the target TAC because you can't allocate less than one trip. In order for an integer to be allocated the fishing mortality target adjusts upward or downward to allocate as close to the full TAC as possible.

¹¹ Under the status quo, with a constant fishing mortality target, the allocations had to be rounded up or down to an integer number of limited access trips.

Specifications: The following estimates describe the potential allocations for full-time limited access vessels, set-asides, and general category vessels.

Table 9. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	27,435 mt	
Fishing year	2006	2007
Total allowable catch	11.54 million lbs. (5,033 mt)	7.87 million lbs. (3,571 mt)
Fishing mortality	0.25	0.20
Two percent set-aside for scallop research	230,780 lbs.	157,454 lbs.
One percent set-aside for funding observers	115,390 lbs.	78,727 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	230,780lbs.	157,454lbs.
Maximum number of limited access trips per vessel	2 trips	1 trips
Number of general category trips authorized	577 trips	394 trips
Percent of TAC allocated	100%	73%

Table 10. Specifications for Closed Area I based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	10,676 mt	
Fishing year	2006	2007
Total allowable catch	5.55 million lbs. (2,518 mt)	5.38 million lbs. (2,441 mt)
Fishing mortality	0.30	0.30
Two percent set-aside for scallop research	111,042 lbs.	107,617 lbs.
One percent set-aside for funding observers	55,521 lbs.	53,809 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	111,042 lbs.	107,617 lbs.
Maximum number of limited access trips per vessel	1 trips	1 trips
Number of general category trips authorized	278 trips	269 trips
Percent of TAC allocated	104%	107%

Table 11. Specifications for Closed Area II based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	32,622 mt	
Fishing year	2006	2007
Total allowable catch	11.54 million lbs. (5,234 mt)	0 lbs.
Fishing mortality	0.20	0.00
Two percent set-aside for scallop research	230,780 lbs.	0 lbs.
One percent set-aside for funding observers	115,390 lbs.	0 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	230,780lbs.	0 lbs.
Maximum number of limited access trips per vessel	2 trips	0 trips
Number of general category trips authorized	577 trips	0 trips
Percent of TAC allocated	100%	

Rationale: The revised access schedule would keep the number of access trips and landings more consistent across years, as compared to the Status Quo alternative. The revised schedule would allocate five access trips in 2006 and seven in 2007, while the status quo alternative would allocate three trips in 2006 and 12 trips in 2007 (See Table 6). The schedule would provide a higher number of Georges Bank area access trips in 2006, when there are no access trips scheduled for the Mid-Atlantic region and fewer trips in 2007 when the Elephant Trunk Area would re-open. This schedule also minimizes the fishing mortality in Closed Area II South, when the year class that was first observed in the 2004 scallop survey becomes vulnerable to the fishing gear. Abundance estimates for this year class are uncertain due to the scallop's very small size and partial selection by the lined survey gear. Nonetheless, the survey results were indicative of an above average set of small scallops.

This alternative was not selected as the proposed action. The primary reason it was not is the result of the court's decision in *Oceana v. Evans* (08/02/05), which determined that EFH closures implemented under both Amendment 10 and Amendment 13 apply to scallop vessels. As a result, the Closed Area I access areas would be restricted to a smaller area than had been analyzed; therefore, the PDT recommended the Contingency Alternative.

3.3.1.2.2 Status quo: Continue the Framework Adjustment 16/39 rotation order and adjust allocations to be consistent with updated biomass estimates

According to Framework Adjustment 16/39 and the current regulations, the three Georges Bank access areas would open to controlled scallop fishing by limited access vessels on a three-year rotation cycle. Each year, two of the three areas would be open for scallop fishing as a controlled access area. During 2006, the areas open for scallop fishing would be Closed Area I and Closed Area II, followed by Nantucket Lightship Area and Closed Area II during 2007. TACs are set and trips are allocated to achieve an $F=0.2$ fishing mortality target. Trips are rounded up or down to the nearest integer and the total authorized landings may exceed or fall short of the TAC in any given year, due to the rounding.

Specifications: The following estimates describe the potential allocations for full-time limited access vessels, set-asides, and general category vessels.

Table 12. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	27,435 mt	
Fishing year	2006	2007
Total allowable catch	9.51 million lbs. (4,312 mt)	8.24 million lbs. (3,739 mt)
Fishing mortality	0.20	0.20
Two percent set-aside for scallop research	190,127 lbs.	164,862 lbs.
One percent set-aside for funding observers	95,063 lbs.	82,431 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	190,127 lbs.	164,862 lbs.
Maximum number of limited access trips per vessel	2 trips	1 trips
Number of general category trips authorized	475 trips	412 trips
Percent of TAC allocated	121%	70%

Table 13. Specifications for Closed Area I based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	10,676 mt	
Fishing year	2006	2007
Total allowable catch	3.90 million lbs. (1,771 mt)	0 lbs.
Fishing mortality	0.20	0.00
Two percent set-aside for scallop research	78,088 lbs.	0 lbs.
One percent set-aside for funding observers	39,044 lbs.	0 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	78,088 lbs.	0 lbs.
Maximum number of limited access trips per vessel	1 trips	0 trips
Number of general category trips authorized	195 trips	0 trips
Percent of TAC allocated	148%	

Table 14. Specifications for Closed Area II based on estimated exploitable biomass.

Total exploitable biomass, 2006 survey	32,622 mt	
Fishing year	2006	2007
Total allowable catch	0 lbs.	12.91 million lbs. (5,857 mt)
Fishing mortality	0.00	0.20
Two percent set-aside for scallop research	0 lbs.	258,249 lbs.
One percent set-aside for funding observers	0 lbs.	129,125 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	0 lbs.	258,249 lbs.
Maximum number of limited access trips per vessel	0 trips	2 trips
Number of general category trips authorized	0 trips	646 trips
Percent of TAC allocated		89%

Rationale: This area access schedule was estimated by Framework 16/39 to achieve optimum yield. Changes in the rotation order to stabilize landings and protect the above average 2004 year class in Closed Area II from fishing are unnecessary. This Council did not select this alternative as the proposed action.

3.3.1.2.3 Contingency Schedule for Rotation of Georges Bank Areas (proposed action)

If Amendment 10 EFH boundaries in Closed Area I are still in effect, the schedule of Georges Bank area rotational trips in 2006 for full-time vessels would be changed from:

- 1 trip in Closed Area I
- 2 trips in Closed Area II
- 2 trips in the Nantucket Lightship Area

to:

- no trips in Closed Area I
- 3 trips in Closed Area II
- 2 trips in the Nantucket Lightship Area.

Part-time and occasional vessels also would take their Georges Bank controlled access area trips in either Closed Area II or the Nantucket Lightship Area, but the total number of controlled access area trips and possession limits would not change compared to the alternative described in Section 3.3.1.2.1. Table 6 describes the allocation program under this alternative as compared to the No Action, status quo, and the preferred action for Framework 18.

Specifications: The following estimates describe the potential allocations for full-time limited access vessels, set-asides, and general category vessels.

Table 15. Specifications for the Nantucket Lightship Area based on estimated exploitable biomass.

Exploitable biomass and TAC for the Amendment 10 access area boundaries was not recalculated because the vast majority of exploitable scallops in the Framework 16/39 access area boundary is in the revised area.

Total exploitable biomass, 2006 survey	27,435 mt	
Fishing year	2006	2007
Total allowable catch	11.54 million lbs. (5,033 mt)	7.87 million lbs. (3,571 mt)
Fishing mortality	0.25	0.20
Two percent set-aside for scallop research	230,780 lbs.	157,454 lbs.
One percent set-aside for funding observers	115,390 lbs.	78,727 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	230,780lbs.	157,454lbs.
Maximum number of limited access trips per vessel	2 trips	1 trips
Number of general category trips authorized	577 trips	394 trips
Percent of TAC allocated	100%	73%

Table 16. Specifications for Closed Area I based on estimated exploitable biomass.

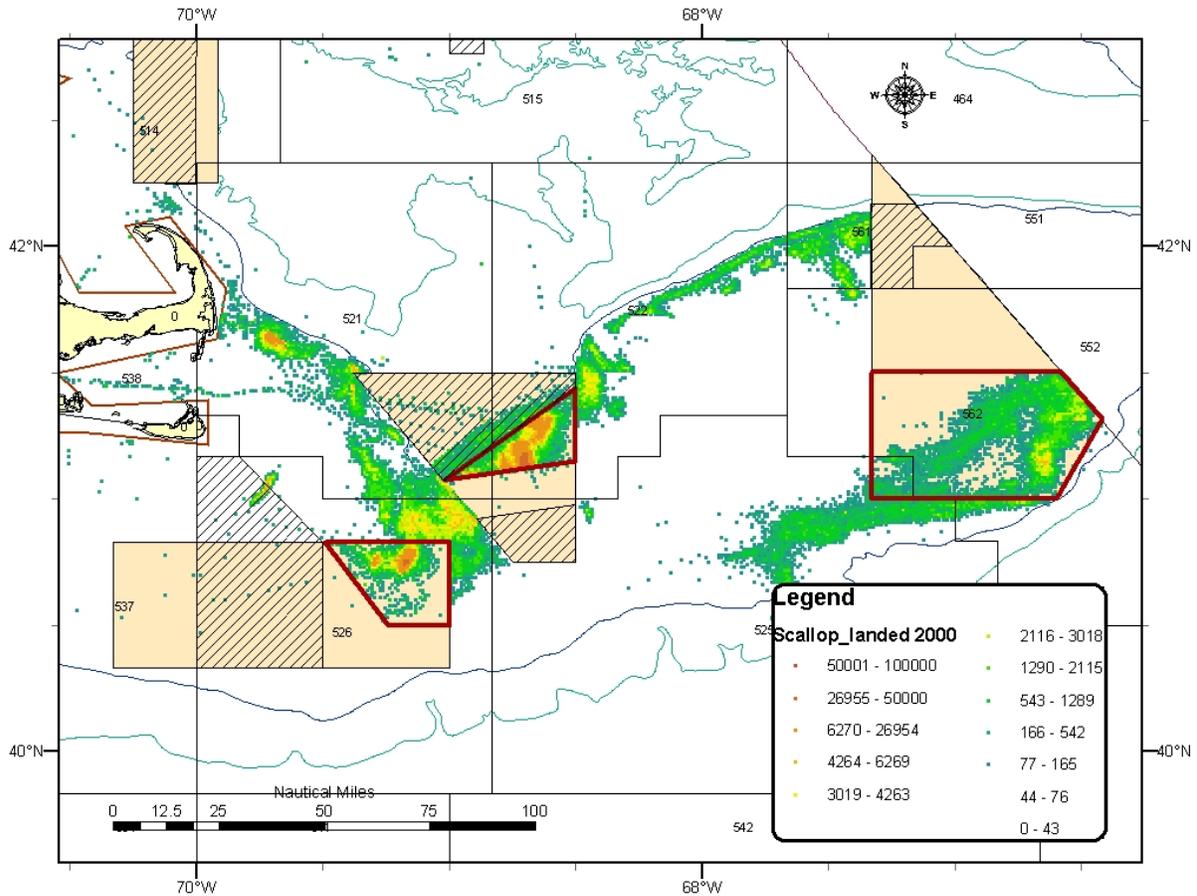
The exploitable biomass and TAC is for the Amendment 10 access area boundaries (see Map 2), using estimates derived from the final 2004 survey data.

Total exploitable biomass, 2006 survey	7,174 mt	
Fishing year	2006	2007
Total allowable catch	0 lbs.	4.32 million lbs. (1,960 mt)
Fishing mortality	0.00	0.30
Two percent set-aside for scallop research	0 lbs.	86,414 lbs.
One percent set-aside for funding observers	0 lbs.	43,207 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	0 lbs.	86,414lbs.
Maximum number of limited access trips per vessel	0 trips	1 trip
Number of general category trips authorized	0 trips	216 trips
Percent of TAC allocated		134%

Table 17. Specifications for Closed Area II based on estimated exploitable biomass

Total exploitable biomass, 2006 survey	32,622 mt	
Fishing year	2006	2007
Total allowable catch	17.31 million lbs. (7,851 mt)	0 lbs.
Fishing mortality	0.30	0.00
Two percent set-aside for scallop research	346,170 lbs.	0 lbs.
One percent set-aside for funding observers	173,085 lbs.	0 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	346,170 lbs.	0 lbs.
Maximum number of limited access trips per vessel	3 trips	0 trips
Number of general category trips authorized	865 trips	0 trips
Percent of TAC allocated	100%	

Rationale: As a result of the court’s decision in *Oceana Inc. v. Evans et al.* (8/2/05) the Closed Area I controlled access area fishery might be restricted to a smaller area than anticipated (see Map 2). The PDT agreed that confining the effort generated by one fishing trip (instead of two trips, one in each of 2006 and 2007) in this area would concentrate too much effort in such small area and could cause localized depletion. The PDT therefore recommended that the Council consider re-assigning the single trip in 2006 to Closed Area II because it felt that the scallop resource in Closed Area II was capable of supporting another trip without out exceeding the rotational area fishing mortality targets. It should be noted that based on fishing effort in 2000 (Map 2) and 2004 (Map 1), most of the fishing effort in the Nantucket Lightship area was within the northeast corner, and not the entire access area as implemented by Framework 16/39. See Section 3.1.2.1 for additional rationale for the Council selecting this alternative as the proposed action.



Map 2. Boundaries of Georges Bank access areas (bold outline) per court order on *Oceana Inc. v. Evans et al.* (8/2/05), showing the distribution of scallop catches during fishing year 2000.

From left to right - the Nantucket Lightship Access Area, the Closed Area I access area, and the Closed Area II access area, also showing the location of the Georges Bank groundfish closed areas (shaded) and the EFH closed areas (hatched). These areas are near Georges Bank and the Great South Channel, outlined by 50 and 100 fm bathymetry contours. Scallop landings in 2000 are distributed by the amount of VMS fishing effort on a trip by trip basis. Fishing effort in 2000 was allowed within the boundaries of access areas defined by Framework 13, before the EFH closures existed.

3.3.1.2.4 Adjustments when yellowtail flounder catches reach the 10% TAC limit

According to current regulations (see CFR §648.53(b)), if the catches of yellowtail flounder on Georges Bank access area trips reaches the 10% TAC limit and closes areas, vessels that have not taken trips are authorized to take those trips in the open fishing areas up to the DAS associated with the unused trips. A vessel with one unused trip would have 12 DAS added to its open area allocation and a vessel with two unused trips would have 24 DAS added. No more than 24 DAS may be added to a vessel's 2006 open area allocation, but the regulation is silent about a limit for 2007. Since the regulation does not specify an amount of DAS that may be fished in the open areas during 2007 when access areas closed due to yellowtail flounder bycatch and because this framework adjustment contemplates changing the controlled access area allocations, a new set of alternatives for addressing this issue are considered below.

3.3.1.2.4.1 *Preferred alternative: Allocate additional open area DAS (at a prorated amount) for each trip not taken before areas close from yellowtail flounder catches (proposed action)*

Limited access vessels with unused Georges Bank access area trips would have their open area DAS allocations increased by a prorated amount that 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 Georges Bank access areas that are being closed due to yellowtail flounder catches. The increase in open area DAS would be increased using these predefined ratios in proportion to the number of unused trips for each vessel. Vessels having the authority to make compensation trips under the broken trip exemption program would similarly receive open area DAS on a prorated basis, depending on the amount of scallops the vessel is authorized to take via compensation trips.

The tables below give two examples. In the access areas, catch per DAS ranges from 2,596 to 2,791 and the average meat count ranges from 10.7 to 12.1 meats per pound. To land 18,000 lbs. of scallops, the average trip length, taking into account the size-dependent shucking capacity of a seven-person crew, is estimated to range from 6.4 to 6.9 DAS (in contrast to the 12 DAS charged for each access area trip). As an example, using an average landing per DAS (1,800 lbs.) and average meat count (22 meats per pound), it would take 5.5 open area DAS to catch the same number of scallops in the open areas as would be caught by landing 18,000 lbs. from Closed Area I. The expected catch in the open area would therefore be 9,913 lbs. of scallops for each 18,000 lb. trip transferred from Closed Area I, due to excess yellowtail flounder catches. In this case, the pre-established transfer of controlled access area trips to open area DAS would range from 4.9 to 5.5 DAS, depending on which areas close to scallop fishing. **This is the example the Council selected to use for calculating open area DAS adjustments; 5.5 for Closed Area I, 5.4 DAS for Closed Area II, and 4.9 DAS for Nantucket Lightship.**

Table 18. Calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.

	Catch/trip	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,596	12.1	6.9	5.5	9,913
Closed Area II access	18,000	2,613	12.0	6.9	5.4	9,780
Nantucket Lightship Area access	18,000	2,791	10.7	6.4	4.9	8,747
Open areas		1,800	22.0			

Using another example with a higher average meat count (17.2 meats per pound) in the open areas (see table below), each controlled access area trip would translate into 6.2 to 7.1 DAS in the open areas, roughly equivalent to the average length of trips in the Georges Bank access areas. This example is not the one used to calculate the open area DAS adjustments for the proposed action. Since the scallops

in the open areas are larger than the above assumption, the total catches in the open areas are higher as well, ranging from 11,214 lbs to 12,709 lbs. compared to the 18,000 lbs. of trips lost due to closure of the access areas.

Table 19. A second example calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.

This 2006 scenario includes alternatives that would use Framework 18 rotation access for the Georges Bank areas and restricted access for the Hudson Canyon Area.

	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,586	12.2	7.0	7.0	13,127
Closed Area II access	18,000	2,604	12.0	6.9	6.9	12,917
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	6.1	11,499
Open areas		1,884	16.8			

Table 20. A third example calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches.

This 2007 scenario includes alternatives that would use Framework 18 rotation access for the Georges Bank areas, restricted access for the Hudson Canyon Area, the Elephant Trunk Area managed with a five-trip allocation, and rotation management area closure of the Delmarva Area.

	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	7.3	12,974
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.4	11,363
Open areas		1,771	17.2			

Rationale: This alternative would reduce, but not eliminate the potential for derby-style fishing effects in the Georges Bank access areas. Vessels with unused trips would be able to use additional DAS in open areas, but the scallop catches would be less than they would be on an access area trip, due to the difference in scallop meats per pound. The advantage of this alternative is that it would not cause increases in overall scallop fishing mortality from the effort shift, because an equal number of scallops would be landed from the additional open area DAS allocations. See Section 3.1.2.2 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.2.4.2 Allocate an equal number of open area trips with an 18,000 possession limit for each trip not taken before areas close from yellowtail flounder catches

For each unused controlled access area trip from Georges Bank access areas that close early due to yellowtail flounder catches, limited access vessels would be able to take a trip in the open areas with an 18,000 lb. possession limit. These trips would not count against the vessel's open area DAS allocations. Vessels would also be able to take compensation trips granted under the broken trip exemption program in the open areas if the Georges Bank access areas close due to yellowtail flounder catches.

Rationale: Although the scallops are expected to be smaller in the open areas than in the Georges Bank access areas during 2006 and 2007, this alternative would enable vessels to catch and land the same

weight of scallops that they had planned on catching from the Georges Bank access areas. Fishing on the transferred trips in the open areas would therefore take longer than in the access areas and cause more fishing mortality per DAS, however. Nonetheless, the fishery would be assured of catching the estimated optimum yield had the areas remained open throughout the expected season. This approach would reduce the pressure to take access area trips as quickly as possible and avert derby-style fishing effects. However, this was not selected as the proposed action because mortality is expected to be greater for one day of open area fishing compared to one day of Georges Bank access area fishing.

3.3.1.2.4.3 Initial allocations of half the trips in each area, raising them by October 1 if the yellowtail flounder catches are not expected to exceed the 10% TAC set aside

The maximum number of trips in each Georges Bank access areas, at the beginning of the 2006 and 2007 fishing years, would be half of the amounts estimated to achieve optimum yield. These initial limits would be rounded up to the next whole number and be no less than one trip for an area open to controlled access fishing. Thus, an area with a three trip (36 DAS) limit to achieve optimum yield would have an initial two trip maximum for that area. An area with a two trip or one trip limit to achieve optimum yield would have an initial one trip maximum. Likewise, the maximum number of trips that vessels with general category permits may take would initially be half of the amount associated with the 2% TAC set-aside.

Under this procedure, limited access vessels would be allocated the full number of controlled access area trips at the beginning of the fishing year. Thus, a vessel would receive an initial controlled access area allocation of five trips (60 DAS) in CFR §648.53, assuming that the trips associated with optimum yield are 2 for Nantucket Lightship Area, 1 for Closed Area I, and 2 for Closed Area II. However, the maximum number of trips specified for each area in CFR §648.60 would initially be 1 trip for each area. Following the procedure described below, the maximum number of trips in CFR §648.60 would be raised on October 1, if the Regional Administrator finds that the fishery will not reach the 10% yellowtail flounder TAC with the initial maximum number of trips assigned to each area.

On or after October 1 of each year, if the Regional Administrator determines that the scallop fishery is unlikely to have yellowtail flounder catch that would reach the 10% TAC cap when all trips are taken with the initial maximum number of trips by area, the Regional Administrator would raise the maximum number of trips that limited access and general category scallop vessels may take up to the number associated with optimum yield. To make this determination, the Regional Administrator would apply the yellowtail flounder catch rates between June 15 to at least September 15 to the remaining trips that vessels could take under the initial limits. If the total of the yellowtail flounder catch plus the assumed catch on remaining trips is less than the 10% TAC, the Regional Administrator would by Notice Action raise the maximum number of trips for the applicable access areas to the amounts associated with optimum yield. An example is given in the following table:

Table 21. Example maximum number of trips and allocations, before and after potential mid-season adjustment.

	Initial limits		Adjusted limits (October 1)	
	Limited access	General category	Limited access	General category
Nantucket Lightship Area	1	200	2	400
Closed Area I	1	50	1	100
Closed Area II	1	150	2	300
Elephant Trunk Area	4	300	4	600
Total controlled access area allocation (full-time)	8		8	

Rationale: This alternative would reduce the potential for a derby-style fishery from developing in a rush for vessels to take trips before areas close from excess catches of yellowtail flounder. Vessels would also have an incentive to attempt to avoid catching yellowtail flounder to have the limits raised on October 1. This approach worked well in 2000, when an additional three Closed Area II trips were allocated mid-season when it became apparent that the fishery would not reach the yellowtail flounder catch limits with the initial allocations.

This alternative would prevent any shift in fishing effort to the open fishing areas and prevent increases in open area fishing effort beyond those associated with optimum yield. This would also use a consistent approach for limited access and general category vessels, reducing the risk that the scallop fisheries would develop into a derby-style fishery if it appears likely that the catches will equal the yellowtail flounder TACs. However, this was not selected as the proposed action.

3.3.1.2.4.4 Status quo: Allow vessels to fish 12 DAS in open areas for up to two trips not taken before areas close from yellowtail flounder catches

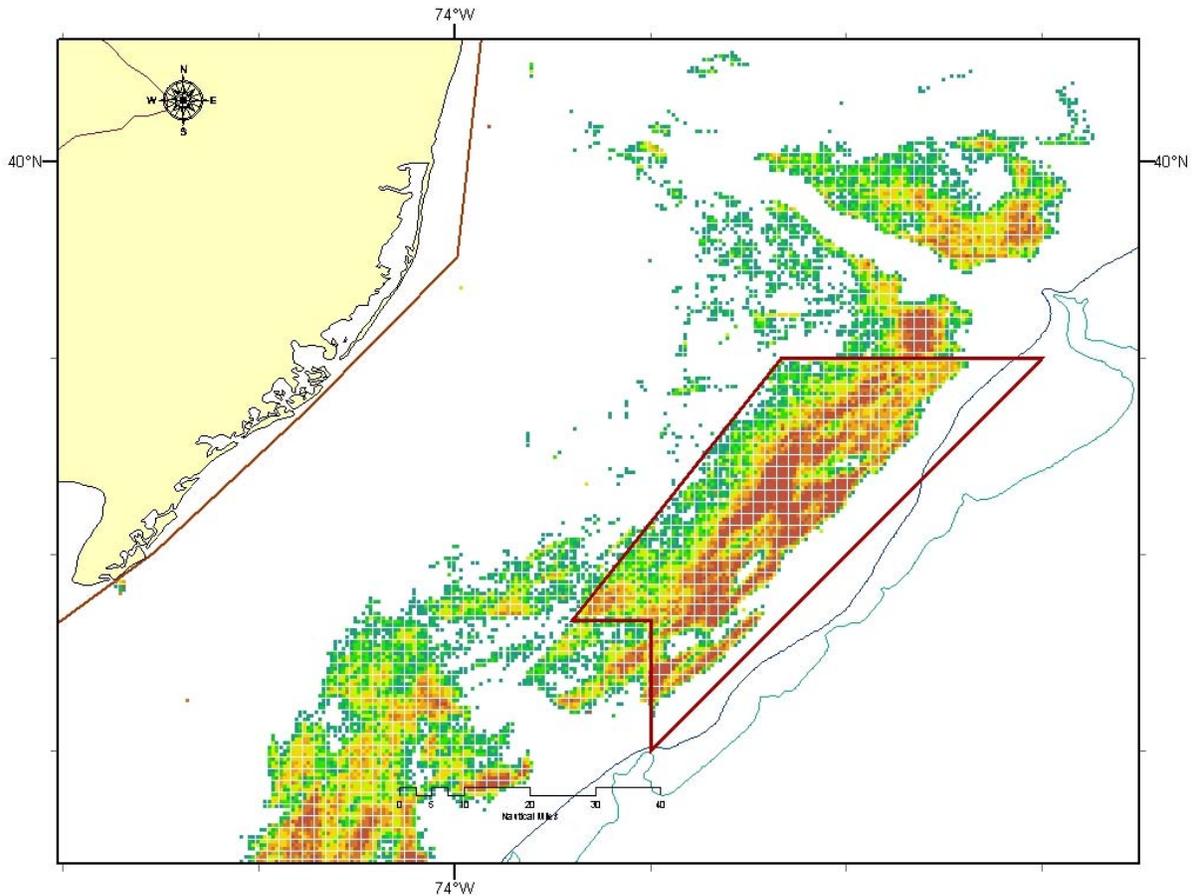
Vessels with unused Georges Bank area access trip allocations available when the areas close due to the catch of yellowtail flounder would have up to 24 DAS added to the vessel's open area DAS allocations, 12 DAS for each unused trip. In 2007, no open area DAS would be added to the vessel's allocation. These limits would apply even if the vessel had a greater number of unused trips.

Rationale: This alternative would limit the potential shift of fishing effort to the open fishing areas where fishing mortality will exceed the amount that maximizes yield-per-recruit. Although the mortality is expected to be greater for one day of open area fishing compared to one day of Georges Bank access area fishing, the alternative would prevent transfers of more than 24 DAS in 2006 and any shift in effort in 2007. This alternative was not selected as the proposed action.

3.3.1.3 Hudson Canyon Area Rotation Measures

The Hudson Canyon Area was initially closed (along with the no longer existing VA/NC Area) in 1998 to protect a strong year class of young scallops. This area re-opened as a controlled access area at the beginning of the 2001 fishing year, after the area had been closed for approximately three years. The FMP gradually increased the fishing mortality target as the scallops grew and aged to achieve optimum yield.

Amendment 10 truncated the area (see Map 3 for current boundaries) because small scallops again appeared in what is now known as the Elephant Trunk Area. It also set annual mortality targets that were consistent with rotation area management and time-average mortality targets to achieve optimum yield. Unless substantial quantities of young scallops appeared, the rotation area management plan would fish the area down to a point when the scallop biomass was near the levels in the surrounding open areas, when it would open to fishing under normal scallop fishing rules. The yield from the Hudson Canyon Area would then be pooled with the yield from other open areas to achieve optimum yield and set open area DAS allocations. Following this policy, Amendment 10 increased the annual Hudson Canyon Area fishing mortality target to 0.40 in 2004 and 0.48 in 2005, whence the area would revert back to a normal scallop fishing area in 2006 until or unless a new bumper crop of young scallops appeared (and the cycle would begin anew with a redefined area boundary).



Map 3. Boundaries of the Hudson Canyon Area

The Hudson Canyon Area is , east of southern NJ, showing the distribution of calendar year 2004 limited access fishing effort. The boundary was truncated in July 2004 by actions taken in Amendment 10.

New data suggests that the biomass was not as high as predicted by Amendment 10 and the TACs for 2004 and 2005 were too high. As a result, the scallop biomass was fished down quicker than anticipated and many vessels were either forced to take sub-optimal trips in the Hudson Canyon Area, or chose to delay taking the 2005 allocations until conditions improve. Two alternatives are thus described below to adjust to the current situation.

3.3.1.3.1 Preferred alternative: Extend the duration of the Hudson Canyon Area (HCA) Access program until February 29, 2008 (proposed action)

During the 2006 and 2007 fishing years, no new or additional Hudson Canyon Area (Map 3) trip allocations would be made and the area would be closed to fishing under an open area DAS. Instead, the HCA would continue as a controlled access area to allow vessels with unused 2005 HCA trips to take them during the 2006 and 2007 fishing years. Vessels with unused broken trips during 2005-2007 would be able to take compensation trips at any time before the end of the 2007 fishing year. The HCA boundaries would dissolve on February 29, 2008, opening the HCA as a regular scallop fishing area where scallop vessels would use open area DAS. If new strong year classes appear, area boundaries would be redefined based on the future scallop resource distribution.

Yield associated with the biomass predicted to exist in 2006 would be pooled with that of the open areas for the purposes of specifying open area DAS, but open area DAS allocations must be fished in the open areas outside of the HCA boundaries. Under current regulations, the HCA would be open for fishing by vessels operating under general category rules, with a 400 lb. possession limit.

The maximum number of trips a limited access vessel may fish in the HCA will be equal to the number of trips the vessel was authorized to fish during 2005 (including any trips that resulted from one-to-one exchanges made during the 2005 fishing year) less any HCA trips taken during the 2005 fishing year. These unused 2005 trips would be available for one-to-one exchanges during the 2006 fishing year with a vessel in the same full-time, part-time, or occasional permit category. In addition, any compensation trips that the vessel was authorized to take during the 2005 fishing year due to broken trips may be delayed and taken at any time during the 2006 or 2007 fishing years. This alternative includes an extension to compensation trips for research funded through the 2005 TAC set-aside.

Rationale: Keeping the HCA available in 2006 and/or 2007 for unused 2005 trips will have the effect of spreading out effort over time and reducing fishing mortality in 2005. Some vessels will delay taking their 2005 trips until conditions improve. Catch rates have declined to less than the 1,912 lbs. predicted for 2005 by Amendment 10. In fact the catch rates by the middle of 2005 may be nearly half of that amount. Shucking is no longer crew limited as the catches from fishing have declined to less than the amount that can be shucked by a 7-person crew. As a result, the amount of fishing time per DAS and the amount needed to catch 18,000 lbs. of scallop meats appear to have increased above previous estimates.

At the present time, about 1/2 (a little more than 500 trips) of the 2005 trips had been taken during this fishing year. Some additional trips will be taken during the current year, but possibly fewer than would be otherwise taken without the proposed measure. As a result of this alternative, some fishing effort and associated mortality will be transferred from the HCA to the open fishing areas during 2006. However, base projections that do not account for the transfer of trips will underestimate the true biomass in 2006 because the analysis assumes that the 2005 HCA TAC will be landed.

Fishing mortality in the HCA during 2005 would be astronomical if the entire 2005 TAC were caught and landed during 2005. In fact, the TAC is nearly as much as the estimated exploitable biomass during the July/August 2005 survey. Transferring trips to 2006 and/or 2007 would allow existing scallops to grow and new recruits to contribute to the biomass in the area. As a result, if 1/2 of the 2005 trips are deferred until 2006, fishing mortality is projected to decline to 0.46 in 2005 and 0.41 in 2006. If the restriction is extended for two years (with half of the remaining trips taken in each year), fishing mortality is projected to decline to 0.29 in 2005, 0.22 in 2006, and 0.19 in 2007.

Delaying a substantial amount of 2005 HCA trips may have benefits if the scallops in the HCA during 2005 are smaller than those that occur in the open areas during 2006, however. As a result, the alternative could increase optimum yield and reduce the effects of high fishing mortality and effort in the HCA during 2005. Due to its distance from shore, the better availability of scallops closer to shore, and the low catches in the HCA, it is unlikely that vessels with general category permits would fish in the Hudson Canyon Area until the resource there recovers.

Allowing the vessels to make one-to-one controlled access area trip exchanges using the HCA trips that carry forward into the 2006 and 2007 fishing years will provide greater flexibility for vessels to adapt to conditions, without compromising the amount of fishing effort assigned to each area to achieve optimum yield. Likewise, allowing vessels to carry forward the unused compensation trips realized in 2005 due to a broken trip would not force the vessel to take those trips during the 2005 fishing year when resource conditions are less favorable. See Section 3.1.3 for additional rationale for the Council selecting this alternative as the proposed action.

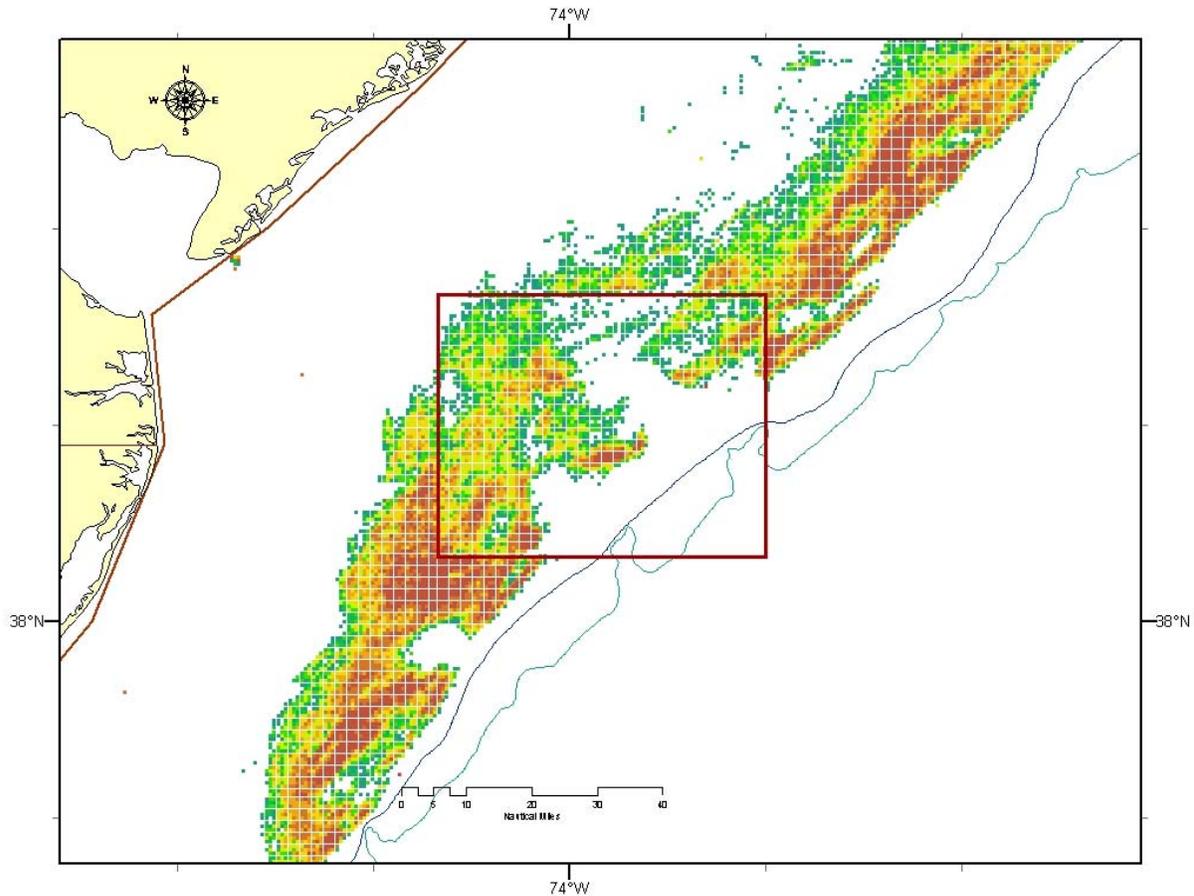
3.3.1.3.2 Status quo: Reclassify the Hudson Canyon Area as open to scallop fishing, pooled into the open area DAS allocations

In accordance with current regulations, the boundaries of the HCA would cease to exist and would become part of the open scallop fishing areas. Its biomass and yield would be pooled with the open areas for the purposes of determining the open area DAS allocations needed to produce optimum yield. Any 2005 HCA trips would have to be taken by the end of the 2005 fishing year.

Rationale: The HCA has been managed according to controlled access rules for five years. Nearly all of the benefits of the rotation area management closure from 1998 to 2000 have been realized, through higher landings and better yield-per-recruit during 2001 to 2005. Under these circumstances, rotation area management policies would allow the area to open under normal scallop fishing rules until or unless a new abundant year class of small scallops re-appeared. This was not selected as the proposed action because opening the area would reduce benefits of area rotation.

3.3.1.4 Elephant Trunk Area (ETA) Rotation Measures

The Elephant Trunk Area (Map 4) has been closed to scallop fishing since July 2004 to protect two very strong year classes until they reach a size that will produce high yield per recruit and optimum yield. According to Amendment 10, the scallops were anticipated to reach this size, i.e. growth rates less than 15% year-over-year, by the 2007 fishing year, when the closure would expire. Rotation area management calls for it to be managed as a controlled access area, with a TAC and limits on the amount of trips that each limited access vessel may take during a fishing year. These trips are area specific, but may be exchanged on a one-for-one basis with another vessel for trips to another area. Alternatively, if the expected increase in biomass failed to materialize, the area could re-open as a regular fishing area. Alternatives are described in this section which could produce the most benefit from using controlled access area management to harvest the scallops in the ETA.



Map 4. Location of the Elephant Trunk Area, SE of Delaware Bay and Cape May, NJ overlaid with distribution of scallop catch during calendar year 2004.

3.3.1.4.1 Initial trip allocations

3.3.1.4.1.1 Preferred alternative: Precautionary initial trip allocations and set-asides (proposed action)

Trip allocations would be made so that the maximum catch on all authorized trips plus amounts set aside for scallop research (2%), funding observers (1%), and for general category catches (2%) would approximate the TAC calculated with a 0.16 fishing mortality target in 2007. The 2007 mortality target is consistent with having a five-year controlled access area program.

Specifications: Relative to status quo, this approach would reduce the initial TACs, set asides, and allocations by about 50%. The maximum number of trips that could be authorized is estimated to be 5 trips per vessel. Vessels with part-time and occasional permits would take fewer trips, because the total controlled access areas allocations would be reduced accordingly, 40% of a full-time allocation for part-time vessels and 1/12th of a full-time allocation for occasional vessels. The following table shows the estimated specifications under this alternative:

Table 22 Estimated specifications for Elephant Trunk Area under the preferred alternative.

Total exploitable biomass, 2006 survey	55,300 mt
Total allowable catch, 2007 fishing year	27.2 million lbs. (12,335 mt)
Fishing mortality ¹²	0.16
Two percent set-aside for scallop research	544,000 lbs.
One percent set-aside for funding observers	272,000 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	544,000 lbs.
Maximum number of limited access trips per vessel	5 trips
Number of general category trips authorized	1,360 trips
Percent of TAC allocated	109%

Rationale: Current biological projections are based on survey data from August 2004, when the large 2002 and 2003 year classes were very young. At that time, their actual abundance is more uncertain due to patchiness and gear selectivity, while future growth and mortality between 2004 and 2007 may deviated from the averages and assumptions applied by the biological projection model. Reducing the TAC and allocations from values in the Status Quo (Section 3.3.1.4.1.2), would take a precautionary approach which would have benefits if the biomass turns out to be less than expected.

Previous controlled access areas programs have overestimated biomass, often by significant amounts (VA/NC Area in 2001, Closed Area II in 2004, and Hudson Canyon Area in 2005). A precautionary approach with initially lower allocations would reduce the risk of over-harvesting the area and/or needing to reduce allocated trips at a later time. Even if 2006 or 2007 biomass ends up at the projected levels, under-harvesting the area will not significantly decrease optimum yield while the area is in a controlled access areas status, because the higher biomass in subsequent years can produce higher yield from the Elephant Trunk Area than if it were initially fished with allocations consistent with an $F=0.32$ target. The current projections still achieve a time-averaged mortality target of 0.20, spread over five years (i.e. 0.16, 0.24, 0.32, 0.40, 0.48), rather than three (i.e. 0.32, 0.40, 0.48).

In addition, fishing more than five trips per vessel during a fishing year is likely to have undesirable effects including higher safety risks, greater effects on the bottom environment from discarded scallop viscera, and a spike in landings which may affect price. See Section 3.1.4.1 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.4.1.2 Status quo: Allocations and set-asides consistent with time-average mortality area rotation targets

Trip allocations would be made so that the maximum catch on all authorized trips plus amounts set aside for scallop research (2%), funding observers (1%), and for general category catches (2%) would approximate the TAC calculated with a 0.32 fishing mortality target.

Specifications: Initial TACs, set-asides, and allocations would be set according to Amendment 10 rotation area management guidance, applying a fishing mortality target of 0.32.

¹² If 2007 biomass projections are accurate.

Table 23 – Specifications for the Elephant Trunk Area under the status quo alternative.

Total exploitable biomass, 2006 survey	121.9 million lbs. or 55,300 mt
Total allowable catch, 2007 fishing year	50.6 million lbs. or 22,952 mt
Fishing mortality	0.32
Two percent set-aside for scallop research	1,012,000 lbs.
One percent set-aside for funding observers	506,000 lbs.
Two percent of TAC allocated to fishing by vessels with general category permits	1,012,000 lbs.
Maximum number of limited access trips per vessel	9 trips
Number of general category trips authorized	2,529 trips
Percent of TAC allocated	105%

Rationale: If the scallop biomass in 2007 equals current estimates, the TAC would be consistent with the strategy of using time-average mortality targets¹³ to achieve optimum yield. This strategy was developed to achieve optimum yield over a three-year controlled access area period. This alternative was not selected as the proposed action. The Council decided to recommend more precautionary allocations because some previous controlled access area programs have overestimated biomass and the TAC.

3.3.1.4.2 Re-opening date

3.3.1.4.2.1 Preferred alternative: Re-open Elephant Trunk Area to controlled access fishing on January 1, 2007 (proposed action)

The ETA would open as a controlled access area on January 1, 2007. Although January and February are in the 2006 fishing year, limited access and general category vessels would be able to take 2007 Elephant Trunk Area trips (or the allocated trips for the first part of a split season, see Sections 3.3.1.4.3.1 and 3.3.1.4.3.3) early as January 1, 2007.

Rationale: This measure is intended to help spread out fishing effort over time, thought to be beneficial because high fishing intensity in restricted areas often carries negative consequences, including risks to safety and unacceptable levels of shucked scallops on the bottom, increasing biological oxygen demand and causing the bottom to ‘sour’. See Section 3.1.4.2 for additional rationale for the Council selecting this alternative as the proposed action.

The Council considered an earlier opening date in late 2006, but there was concern that doing so would catch more scallops on a trip landing 18,000 lbs. of scallop meats, because of lower meat yield during and shortly after fall spawning and due to the captured scallops not benefiting from the spring growth spurt during 2007. Industry testimony during scoping indicated that by January, the meat yield would have recovered from spawning activities and benefits would be realized by spreading out fishing effort over a longer period of time.

¹³ According to Amendment 10 rotation area management policy, time average mortality targets applies a strategy such that the mortality rate averaged over time since the initial closure of the area does not exceed 0.2. Fishing mortality while the area has been re-opened ramps-up such that at the end of the period, the average fishing mortality is 0.20, equivalent to a mortality rate that maximizes yield-per-recruit if fished continuously and as reduce to account for uncertainty (the current estimate of ‘F_{max}’ is 0.24). A three year controlled access area program that follows a three-year closure could, under this policy, have annual fishing mortality targets of 0.32, 0.40, and 0.48.

3.3.1.4.2.2 Re-open Elephant Trunk Area to controlled access fishing on March 1, 2007

The area described in CFR §648.58, known as the Elephant Trunk Area, would open to scallop fishing on a limited basis on March 1, 2007. In accordance with area rotation policies in Amendment 10, an annual TAC would be estimated and limited access vessels would be authorized to take a maximum number of trips during the 2007 fishing year. The intent is to continue managing the ETA as a controlled access area as long as scallop biomass and commercial catches per day are above those of the surrounding open scallop fishing areas. Under the Amendment 10 rotation area management policies for an area that had been closed for three years, the fishing mortality target in the first year is 0.32, 0.40 in the second year, and 0.48 in the third year. To achieve optimum yield and/or account for uncertainty, the allocations may be less than those associated with these targets (see Section 3.3.1.4.1.1).

Rationale: At the time of the 2006 survey, the year-over-year scallop growth rate is estimated to be 14% and decline to 8% by the 2007 survey¹⁴. By the beginning of the 2007 fishing year in March, the growth rate for the large year-classes of scallops is expected to be sufficiently slow that further protection by closure will not improve optimum yield. The scallop biomass is expected to be very high, possibly at record levels that were observed in the Nantucket Lightship Area. Thus managing the area as a controlled access areas beginning in 2007 is expected to achieve optimum yield, having positive economic impacts, while minimizing adverse effects on the environment. The Council did not select this alternative as the proposed action because a start date of January 1 would help spread out effort.

3.3.1.4.3 Seasonal closures to minimize interactions with sea turtles and reduce scallop and finfish discard mortality

3.3.1.4.3.1 Seasonal closure of the Elephant Trunk Area from June 15 to November 14

During the 2007 fishing year, the ETA would be closed to scallop fishing during June 15 to November 14. Thus limited access and general category vessels could take authorized trips to the Hudson Canyon Area during March 1 to June 14, 2007 and then from November 15, 2007 to February 29, 2008.

Rationale: Closing the ETA during this longer season would provide the greatest benefit for minimizing finfish and scallop discard mortality caused by high water and deck temperatures, as well as minimizing the potential for interactions with sea turtles. During 2003 to 2004, sea turtles were observed as early as June and as late as October. Although 'chain mats' that NMFS may require reduce the probability of capture and injury, interactions with 'chain mats' equipped dredges is still possible.¹⁵ This alternative would avoid having intense scallop fishing effort in areas and times when sea turtle interactions have been observed. This alternative was not selected as the proposed action, the Council determined that the potential benefits did not outweigh the costs of closing this area for five months.

3.3.1.4.3.2 Seasonal closure of the Elephant Trunk Area from July 15 to October 31

During the 2007 fishing year, the ETA would be closed to scallop fishing during July 15 to October 31. Thus limited access and general category vessels could take authorized trips to the Hudson Canyon Area during March 1 to July 14, 2007 and then from November 1 2007 to February 29, 2008.

Rationale: A shorter closure would give vessels a longer time to take their ETA trip allocations, reducing the potential crowding and environmental effects associated with a shorter fishing season. This

¹⁴ Scallop surveys are customarily conducted in late July and early August.

¹⁵ A proposed rule was published on May 27, 2005, and if approved would require all scallop vessels with a federal scallop permit (limited access and general category) using scallop dredge gear, regardless of dredge size to install 'chain mats' in dredges from May 1 to November 30).

alternative would close the ETA during most of the late summer and early fall months when turtle interactions were observed in August, September, and October. Unlike the alternative above, it would not provide added protection beyond the turtle 'chain mats' during the early summer when turtle interactions were also observed during mid-June. This alternative was not selected as the proposed action, the Council determined that the potential benefits did not outweigh the costs of closing this area for three and half months.

3.3.1.4.3.3 Seasonal closure of the Elephant Trunk Area from September 1 to October 31 (proposed action)

During the 2007 fishing year, the ETA would be closed to scallop fishing from September 1 to October 31 to protect sea turtles.

Rationale: This alternative would close the ETA when the majority of turtle catches were observed over the last two years, and minimize the potential economic impacts of a longer closure. During 2003 and 2004, nine of twelve sea turtle interactions in the area were taken during the months of September and October. See Section 3.1.4.3 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.4.3.4 Year-round access

Limited access and general category scallop vessels would be able to take trips at any time during the fishing year, subject to closure to general category vessels when the trips reach the limit.

Rationale: This alternative would provide the most flexibility for fishermen to determine when to take Elephant Trunk Area trips. However, it would not offer any additional protection and conservation to minimize finfish and scallop discard mortality, or to reduce interactions with sea turtles. Conservation of sea turtles would depend entirely on the proposed 'chain mats'. This was not selected as the proposed action.

3.3.1.4.4 No action alternative

The ETA is closed under CFR §648.58 until February 28, 2007, whence it would re-open to scallop fishing under open area scallop fishing rules. The associated catch and fishing effort would be pooled into the open area DAS allocations (see Section 3.3.1.5).

Rationale: Closed rotation areas could open to regular scallop fishing if management as a controlled access area would not enhance net benefits and produce optimum yield. Such an outcome might develop, for example, if the closure was ineffective in reducing mortality on small scallops and average catch per unit effort was the same or less than in surrounding open areas.

Current projections indicate that Elephant Trunk Area biomass in 2007 will be very high and scallop biomass density will support much higher landings per DAS than in the surrounding open fishing areas. Thus this alternative is not expected to achieve optimum yield, and was not selected as the proposed action.

3.3.1.5 Procedures to adjust Elephant Trunk Area (ETA) allocations to account for uncertainty in 2007 Elephant Trunk Area biomass estimates

3.3.1.5.1 Rulemaking procedure (proposed action)

This alternative identifies actions to be taken by the Regional Administrator (RA), based on total exploitable biomass in the ETA estimated from surveys conducted during early to mid-2006. When changes in allocations are necessary, the downward adjustment would be published as a final rule before March 1, 2007, the start of the fishing year, or before January 1, 2007 if the ETA opens for fishing on that date.

The RA will adjust the number of ETA trips using the table below (see specifications) provided that an updated biomass projection is available to publish a final action implementing such an adjustment in the Federal Register, pursuant to the Administrative Procedure Act. Such notification in the Federal Register will be published no later than December 1, 2006 (January 30, 2007, if a March 1, 2007, opening). If information is not available (due to timing or other issues) such that NMFS cannot publish a notice by December 1, 2006 (January 30, 2007), no adjustment will be made.

The adjustment of the 2007 ETA trip allocations will be based on all available scientific surveys of scallops within the Elephant Trunk Area. Cooperative industry survey data should be used in conjunction with the R/V Albatross survey results to estimate total exploitable biomass. Survey data must be available with sufficient time for review and incorporation in the biomass estimate. If NMFS determines that a survey is not scientifically sound and unbiased, those results will not be used to estimate biomass. If no cooperative industry surveys are available, the results from the annual R/V Albatross survey will be used alone to estimate exploitable scallop biomass for the ETA.

If the biomass is higher than projected, no upward adjustments in trip allocations will be made. If ETA biomass is *somewhat* less than projected and would not cause ETA fishing mortality to exceed 0.32 or overfishing of the resource to occur, then the initial allocations would not need adjustment. However, if the ETA biomass is *considerably* less than projected so that the initial trip allocation causes ETA fishing mortality to exceed 0.32 or overfishing of the resource to occur, then the regulatory action would reduce the ETA trip allocations to a level consistent with achieving the area rotation fishing mortality target ($F=0.32$).

Specification: The table below shows the thresholds and adjustments to be made in 2006 with available survey data. These results are for the preferred alternative for which the initial ETA allocation is 5 trips per vessel (TAC=12,229 mt), the Hudson Canyon Area is under restricted access in 2007, the new Delmarva rotation area is closed, and the open area allocation does not exceed 51 DAS in 2007 (20,000 open area DAS total)¹⁶. These estimates are derived from applying a bootstrap procedure to the biological projections which vary the 2004 ETA scallop abundance (see Section 5.1.3.4). Under the above set of management options, no ETA trip adjustments are needed to prevent overfishing, because the overall fishing mortality target is $F=0.172$. This target provides a buffer for increases in resource-wide mortality enough to account for the additional Elephant Trunk Area mortality at lower biomass, when the ETA fishing mortality is less than 0.32.

¹⁶ These factors are important considerations to determine whether a decrease in ETA biomass, to levels below those currently projected, would cause overfishing.

Table 24. Estimated 2006 ETA exploitable biomass associated with the initial TAC and trip allocations in Framework 18.

Biomass triggers in 2006 represent cut points at which the allocation at the next higher trip allocation would cause ETA fishing mortality to exceed $F=0.32$.

2006 ETA exploitable biomass (mt)	2007 TAC (mt) @ $F=0.16$	2007 TAC (million lbs.) @ $F=0.16$	Number of Elephant Trunk Area trips
55,130	12,229	26.96	5
ETA exploitable biomass triggers (mt)	Adjusted 2007 TAC (mt)	Adjusted 2007 TAC (million lbs.)	Adjusted number of Elephant Trunk Area trips
< 22,920	5,234	11.54	2
22,920 – 28,650	7,851	17.31	3
28,651 – 34,380	10,468	23.08	4
34,381 – 64,230	13,085	28.85	No Adjustment $0.16 \leq F \leq 0.32$
64,231 – 74,860	15,702	34.62	No upward adjustment
74,861 – 85,500	18,319	40.39	No upward adjustment
> 85,500	20,936	46.16	No upward adjustment

Rationale: This procedure would make use of a more rapid, event-triggered rulemaking to correct the ETA allocations, ensuring that optimum yield is achievable even if there is insufficient time to develop a framework adjustment when new ETA biomass data becomes available. There is considerable uncertainty in the projected scallop biomass in the ETA, because a substantial majority of it is currently young scallops, whose true abundance is difficult to estimate with a high degree of precision.

The procedure would rely on the analyses in this document to set specifications based on total exploitable scallop biomass in the ETA and would also rely on public comment on these measures during the scoping of Framework Adjustment 18. These corrections are analyzed in the Environmental Assessment for Framework 18, making further analysis and public comment unnecessary when the adjustment is made.

A framework adjustment cannot be developed in time to implement the adjusted specifications at the start of the 2007 fishing year on March 17, if survey and biological data become available too late to be of practical use. Many of the surveys are conducted during the late spring and summer, which are usually too late to prepare the necessary analyses in a framework adjustment that would be implemented before the start of the next fishing year. Therefore, this option sets up a rulemaking procedure that would permit NMFS to adjust the ETA allocations if necessary based on available survey data. See Section 3.1.5 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.5.2 Adjustments by framework action

In addition to the normal two-year schedule of Scallop FMP framework actions for setting specifications, the Council could at any time initiate a framework action to take action necessary to achieve optimum yield. This action would be developed following normal procedures that govern framework actions.

17 Or when the ETA area opens for fishing using trip allocations for 2007.

Rationale: Framework actions allow for a greater range of actions and adjustments, because the analysis of impacts is developed and public comment is taken at that time. The greater degree of analysis and deliberation, however, takes time and the review process is lengthy, including formal agency review followed by publication of a proposed rule with opportunity for further public comment. If data on the amount of ETA scallop biomass is available early enough (very early 2007), a framework action would be initiated and developed in time to implement the adjustments before the start of the 2007 fishing year on March 1. Due to the time necessary to develop, complete, and approve a framework adjustment, it would have to be initiated at least by April 2006 using data available at that time. A second and final framework meeting would be needed in June 2006. Since this option would take longer, the Council did not select this option as the proposed action for making adjustments to ETA allocations.

3.3.1.6 Delmarva Area Rotation Closure

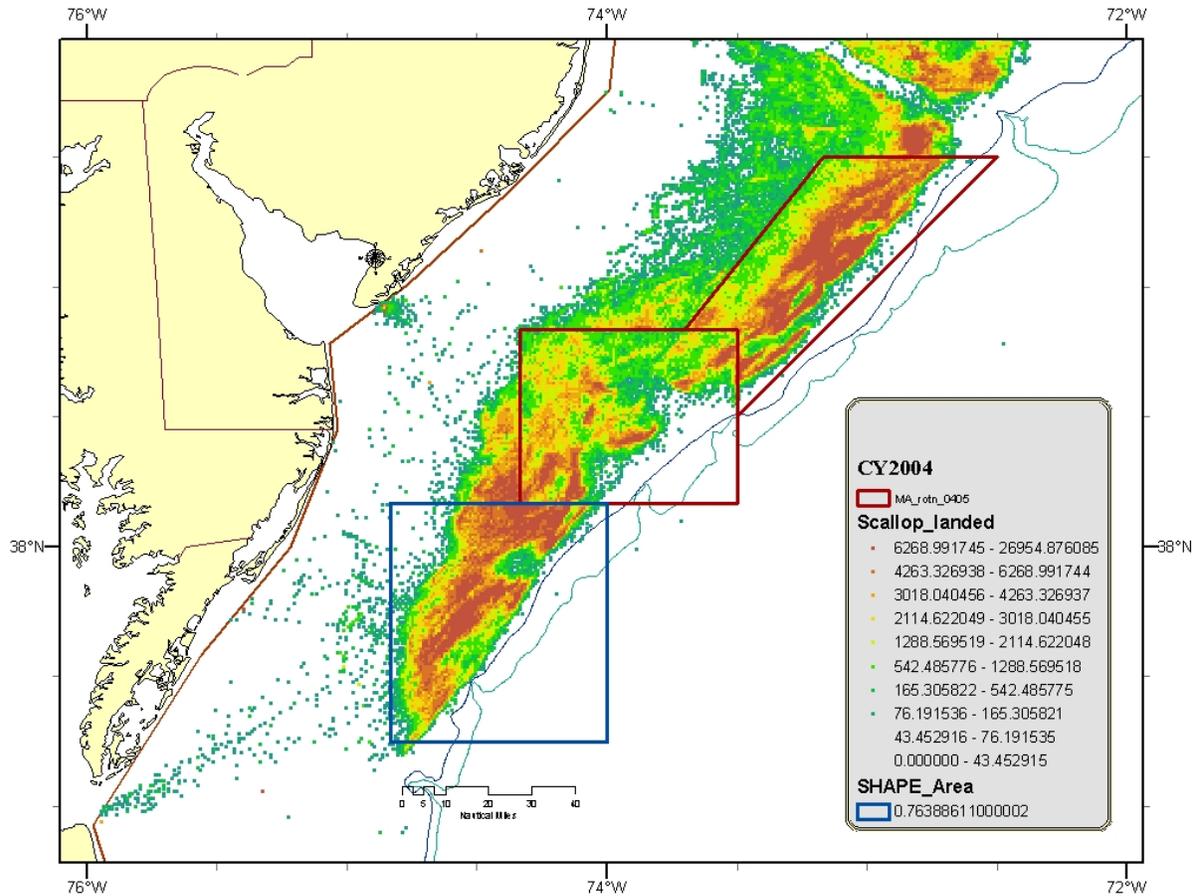
A Delmarva rotational area would be established to protect a strong year class of young scallops in this region (Map 5). High numbers of small (mostly between 40 and 60 mm, from the 2003 year class) scallops were observed in most of the stations in this area (Map 6).

Table 25. Proposed boundaries of Delmarva area rotation closure.

	Latitude (Degrees N)	Longitude (Degrees W)
DMV1	38°10'	74°50'
DMV2	38°10'	74°00'
DMV3	37°15'	74°00'
DMV4	37°15'	74°50'

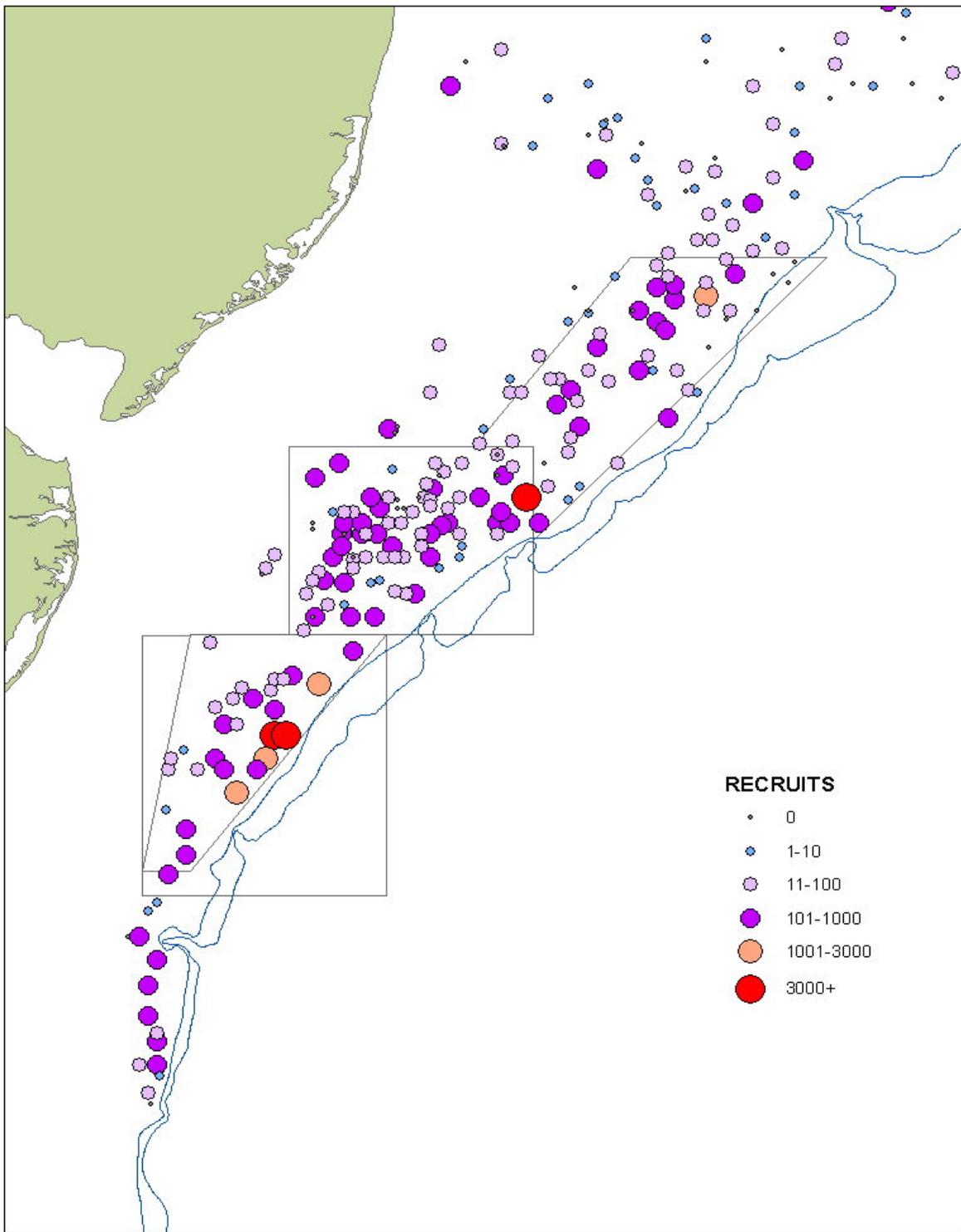
The Delmarva Area would remain closed for three years until 2010 when the small scallops have grown sufficiently to be harvested and appropriate trip allocations have been made.

Rationale: Establishing the Delmarva Area as a rotational closure would ensure the continued success of the scallop FMP in maintaining a high yield per recruit and productivity levels into the future. Projections, based on the 2004 NMFS survey, that include the Delmarva rotational closure show increased long-term landings with no reduction in short-term landings compared to either the no action or status quo alternatives, even when the large year class observed in the 2005 survey is not included. (The difference between the two alternatives is the level of open area DAS under each alternative). The area would be re-opened to controlled access area fishing in 2010 when the scallops are expected to be about 120-130 mm in average size (10-20 count).



Map 5. Boundaries of the Delmarva Area.

The Delmarva area is the lowermost rectangle east of Maryland. The contours show depth and the distribution of calendar year 2004 limited access fishing effort.



Map 6. Distribution of < 70 mm scallops in the 2005 NMFS annual scallop survey, showing proposed boundaries of a new scallop rotation management area, immediately south of the ETA slated to re-open to fishing in 2007. (The Delmarva area is the lowermost rectangle, *not* the smaller polygon within it)

3.3.1.6.1 Preferred alternative: Close the Delmarva Area when the Elephant Trunk Area (ETA) opens in 2007 (proposed action)

The Delmarva Area (Map 3) would be closed to all scallop vessels to protect the 2003 year class when controlled access scalloping is allowed to begin in the Elephant Trunk Area (ETA). Depending on which opening date for the ETA, this would occur either on either Jan. 1, 2007 or on March 1, 2007.

Rationale: This option prevents the entire Mid-Atlantic from being closed at once. Furthermore, closing Delmarva would ensure the continued success of the rotational area management program. Closing the area is expected to increase the landings of more valuable scallops by 180%. See Section 3.1.6 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.1.6.2 Close the Delmarva Area on September 1, 2006

The Delmarva Area (Map 3) would be closed to all scallop vessels to protect the 2003 year class on September 1, 2006.

Rationale: Small scallops can be caught by trawls earlier than with dredges; therefore this alternative provides additional protection. However, the Council did not select this alternative as the proposed action.

3.3.1.6.3 Do not close the Delmarva Area during 2006 and 2007 (status quo)

No new scallop rotation closures would be initiated by Framework 18.

Rationale: The Council would choose this alternative if there are insufficient new recruits that appear in the 2005 survey to justify a new rotation area management closure. The benefits of closing this area have been determined to outweigh the costs of potential economic dislocation; therefore, this alternative was not selected as the proposed action.

3.3.2 Open Area Management

3.3.2.1 DAS Allocations

After controlled access area allocations are determined, the open area DAS are set at a level (after deducting the expected catches and effort caused by the general category fishery) that would either achieve a fishing mortality target of $F=0.2$ for the entire resource, or in special circumstances be reduced to achieve optimum yield. Such a circumstance may exist for example when a high fraction of the scallop biomass is in closed areas or in a controlled access area where the target fishing mortality is less than $F=0.2$. When this occurs, it takes more and more days in the open areas to achieve an overall $F=0.2$ target, as the amount of biomass in rotation area managements increases. Fishing mortality in the open area would be several times higher than the amount that maximizes yield from the open areas, causing localized overfishing to occur. The excess effort in the open areas increases the amount of time fished, reduces catch rates, and increases the effects of fishing on the environment.

These conditions are forecast for 2006 and 2007 if the Elephant Trunk Area biomass is as high as estimated and the alternatives in this framework adjustment are approved. In 2006, the Elephant Trunk Area closure will continue and the scallops in the EFH areas on Georges Bank would be inaccessible. Particularly since the Elephant Trunk Area biomass is forecast to be 33% of the total exploitable scallop biomass for all areas, it would take at least 60,000 open area DAS to achieve a resource wide $F=0.2$ target. In 2006, 50% of the total scallop biomass is forecast to be in closed areas and 26% in access areas.

In 2007, 34 percent of the biomass is forecast for the Elephant Trunk Area and it would be open as a controlled access area, but the TAC would be estimated using a $F=0.16$ target. In 2007, 60% of the biomass is forecast to be in access areas and 21% in closed areas. Fishing 40,000 to 60,000 DAS on the remaining 19 to 24 percent of the scallop resource in open areas would be excessive.

Following the procedures in CFR §648.55, the Scallop PDT recommended that the Scallop FMP should allocate no more than 20,000 open area DAS in 2006 and 2007. This is actually a modest increase in open area DAS, compared with the amounts allocated by Amendment 10 in 2004 and 2005, allowing for a full-time DAS allocation of a bit more than 50 DAS (compared with 42 DAS in 2004 and 40 DAS in 2005). Such an increase in DAS is possible because of the scallop rebuilding that has occurred over the past several years in the open areas. Even with this increase, the overall fishing mortality with a 20,000 open area DAS allocations is forecast to be 0.14 in 2006 and 0.17 in 2007.

In making these recommendations to achieve optimum yield, the PDT considered the effect of the following factors:

- Differential fishing mortality rates for the various spatial components of the resource
- Overall yields from the portions of the scallop resource available to the fishery
- Outlook for phasing in and out closed or controlled access areas under the area rotation program, and
- Potential adverse impacts on EFH.

Under the Scallop FMP and CFR 648.55, the open area DAS allocations should be set annually and adjusted every two years to achieve optimum yield at the target fishing mortality ($F=0.2$) for the resource. Since the formula also includes the mortality in controlled access areas, the open area DAS allocations depend on controlled access area management TACs that are approved. The open area DAS are estimated in the table below for the ten options analyzed by the PDT. Potentially, nine outcomes are possible, combinations of management alternatives for the Georges Bank access areas, the Elephant Trunk Area, and the Hudson Canyon Area. For simplicity, three alternatives below present a range of outcomes based on the controlled access area management alternatives that would be approved. Other combinations of controlled access area management alternatives chosen would result in open area DAS allocations that are intermediate between these ranges.

Specifications: Table 26 summarizes the various management options that were analyzed, including how the open area DAS were combined with various rotational area management scenarios. A total of ten different scenarios were assessed including the No action and Status Quo alternatives. Table 27 shows the DAS allocation estimates to achieve optimum yield, which is contingent on the various choices of alternatives for area rotation in Section 3.3.1. Estimated DAS usage values are included.

Table 26. Area Rotation and open area DAS management scenarios (10 options analyzed) (proposed action shaded).

Alternatives	Open area DAS per FT vessel	Controlled access area trips	Elephant Trunk	Hudson Canyon	Delmarva	Total DAS per FT vessel
No Action – 24.7K open area DAS in 2006 and 2007						
2006	67	2 trips in CAI & NLS (24 DAS)	Closed	Fully open	Open	91
2007	67	2 trips in CAI & NLS (24 DAS)	Fully Open	Fully open	Open	91
Status Quo -24.7K open area DAS in 2006						
2006	67	2 tin CAI, 1 t in NLS (36 DAS)	Closed	Fully open	Open	103
2007	62	1 t in CAI, 2 t in NLS (36 DAS)	9 trips	Fully open	Open	206
Framework 18 - 15K open area DAS in 2006						
2006	36	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	96
2007	72	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	156
Framework 18 - 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	112
2007	69	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	153
Framework 18 - 24.7K open area DAS in 2006						
2006	67	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	127
2007	68	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	152
Framework 18 - 30K open area DAS in 2006						
2006	84	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	144
2007	67	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	151
FW 18: 2Yr HCA restriction, 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	71	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Open	155
DMV closure – 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	78	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	162
DMV closure - 18K open area DAS in 2006 and 2007						
2006	46	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	106
2007	45	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	129
DMV - 20K open area DAS in 2006 and 2007 (Proposed Alternative)						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	51	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	135

Table 27. Estimated allocations and projected DAS use for open scallop fishing areas, proposed action shaded.

Rotation area management alternatives	Fishing year	Total allocated limited access DAS	Projected limited access DAS use	Allocations per limited access vessel		
				Full-time open area DAS	Part-time open area DAS	Occasional open area DAS
DMV closure – 18K open DAS	2006	37,092	27,737	46	18	4
	2007	44,269	32,095	45	18	4
DMV closure – 20K open DAS (Proposed Action)	2006	39,017	29,591	52	21	4
	2007	46,323	34,075	51	20	4
DMV closure – 24K DAS in 2006	2006	39,017	29,591	52	21	4
	2007	54,876	42,316	78	31	7
Framework 18 – 15K open DAS in 2006	2006	34,071	24,825	36	14	3
	2007	53,044	40,551	72	29	6
Framework 18 – 20K open DAS in 2006 & 2007	2006	39,080	29,670	52	21	4
	2007	49,937	37,481	63	25	5
Framework 18 – 30K open DAS in 2006	2006	49,257	39,459	84	34	7
	2007	51,285	38,856	67	27	6
FW 18 rotation – 24K DAS in 2006	2006	43,844	34,243	67	27	6
	2007	51,758	39,312	68	27	6
FW 18: 2Yr HCA restriction	2006	39,017	29,591	52	21	4
	2007	52,644	40,166	71	28	6
	2007	52,019	39,563	69	28	6
No action (DAS = 67)	2006	36,306	30,058	67	27	6
	2007	36,311	30,146	62	25	5
Status quo (F=0.20)	2006	36,305	30,056	67	27	6
	2007	55,189	35,166	19	8	2

Rationale: The amount of open area DAS allocated to the fleet has implications for finfish bycatch, scallop non-catch mortality, and for habitat effects. Taking these into consideration, the PDT recommended that in order to achieve optimum yield the open area DAS allocations should not exceed 20,000 DAS whether or not the Delmarva area is closed to fishing in 2007, or whether or not the Hudson Canyon area remained classified as a controlled access area in 2006 and 2007. Although more DAS could be allocated to achieve an overall F=0.20, higher open area DAS use is expected to cause overharvesting of the open areas, causing a loss in long-term yield from areas not under rotation area management. Therefore, the Council selected “DMV Closure-20K open DAS” as the proposed action, which proposes to allocate 20,000 open area DAS in both 2006 and 2007.

3.3.2.2 DAS set-aside for observers (1%) and research (2%) and assumptions for catches by the general category fleet

The proposed action limits open area DAS use to 20,000 to achieve optimum yield. Some of this effort includes fishing by general category vessels targeting scallops in open areas, which has been growing rapidly in the last year or so. The Scallop PDT assumed that the general category catches from open areas would total about 7.5 million pounds, or about the equivalent of 3,500 DAS fished by a full-

time limited access scallop vessel. This effort equivalent was deducted from the total limit before making allocations to the limited access vessels (see above).

This action continues the set-aside program that deducts one percent of the allocated DAS to help fund observer coverage on scallop vessels and two percent to fund scallop-related research with compensation trips taken in open scallop fishing areas. Since 16,500 open area DAS would be allocated each year, the DAS set-asides to be earmarked annually to compensate vessels for observer and research costs are 165 and 330 DAS, respectively (Table 28).

Table 28. Annual open area DAS set-asides for 2006 and 2007.

	One percent DAS set-aside for funding observers	Two percent DAS set aside for funding scallop-related research
Total DAS limit to achieve optimum yield: 20,000 DAS	165 DAS	330 DAS
Assumed full-time equivalent fishing effort by the general category fleet: 3,500 DAS		
Allocation of limited access DAS: 16,500 DAS		

3.3.2.3 DAS administration and monitoring

The Council recommends that fishing effort in open areas by limited access vessels should be counted against the vessel's annual open area DAS allocations. Vessels would be allowed to use up to 10 unused DAS carried forward from the previous fishing year, in accordance with CFR §648.53(e), and would be allowed to carry-forward up to 10 unused DAS in 2006 and 2007.

If Framework 18 is not approved and implemented by March 1, 2006, DAS used to fish in the open areas will be counted against the allocation that is ultimately approved for fishing year 2006. If a vessel fishes in the open areas for more DAS than is ultimately allocated for 2006, then the excess DAS will be counted against the vessel's 2007 open area DAS allocation.

Rationale: This recommendation is needed to clarify the status of 2006 DAS used before approval and implementation of Framework 18 if it is delayed. It is also needed to ensure that the fishing effort does not exceed the level associated with optimum yield or cause overfishing to occur.

3.3.3 Limited access crew limits

According to the regulations at CFR §648.51, vessels with limited access scallop permits may carry no more than 7 persons, as a measure that is a primary control of fishing power of the vessel. Vessels with small dredge permits may carry no more than 5 persons. These measures are a primary control of fishing power of the vessel, improving the effectiveness of DAS limits, particularly in open fishing areas. In controlled access areas, the limit on the number of crew decreases the amount of actual fishing time, as in many areas the vessel must lie-to to shuck the high volume of scallops caught by the vessel's fishing gear. Primarily in the open areas, but also in controlled access areas under certain circumstances, the crew limit also induces the vessel to target larger scallops, because it takes more shucking time and DAS to process a similar weight of smaller scallops. Therefore the crew limit also improves size selectivity by the fleet under certain conditions. A crew limit may also prevent the rush to fish in an effort to catch the allocated scallops when the fishing costs are the least, before catch per unit effort declines. These effects are analyzed in Section 5.1.1.4.

3.3.3.1 Preferred alternative: Eliminate the 7 person crew limit (5 persons on small dredge vessels) for vessels on controlled access area trips (proposed action)

Limited access vessels on a controlled access area trip (for example to Nantucket Lightship Area, Closed Area I, Closed Area II, and the Elephant Trunk Area) would have no limit on the number of crew that it may have aboard. Controlled access area trips are declared by the vessel before leaving port and are counted against the vessels controlled access area DAS allocation.

Rationale: Lifting the crew limit on controlled access area trips will not affect the total weight of scallops that may be landed. As long as the size of scallops in the controlled access area remain constant (usually a large average size), the number of crew will have no effect on the number of scallops that are cut and landed. Having no crew limit will give fishermen the most flexibility for determining the length of the trip, thereby potentially reducing costs, and for determining the number of crew needed to maintain safe conditions. See Section 3.1.8 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.3.2 Raise the crew limit from 7 to 8 persons for limited access vessels and from 5 to 6 persons on limited access small dredge vessels while on a controlled access area trip

Limited access vessels on a controlled access area trip (for example to Nantucket Lightship Area, Closed Area I, Closed Area II, and the Elephant Trunk Area) would be able to carry up to 8 persons, 6 persons for vessels issued a small dredge limited access permit.

Rationale: Particularly in areas having large scallops where the catches are shucking-limited, an increase in the number of crew could relieve fatigue, improve safety, and offer an opportunity for vessels to take on and train new crew where scallop production per DAS are not as important for achieving conservation. This will increase the amount of fishing time per DAS, but in controlled access areas the catches are controlled by a possession limit, trips would therefore be shorter in duration, and there would be no net effect on the total amount of fishing time as long as the catch was still shucking limited by a larger number of crew. This was not selected as the proposed action because it does not provide as much flexibility as the proposed action described above.

3.3.3.3 Status quo: Continue 7 person crew (5 persons on vessels with small dredge permits) limit on all limited access vessels

Limited access vessels would be able to carry up to 7 persons on all trips, including those taken to a controlled access area. Limited access vessels with a small-dredge permit would be able to carry up to 5 persons on all trips.

Rationale: Keeping the current crew limits for limited access vessels would make regulations more consistent across areas and might prevent vessels from targeting smaller scallops when catch rates of large scallops begin declining with biomass in the latter years of a controlled access program. Although difficult to replace a regular crew person for this purpose, vessels would still be able to take on and train new crew on controlled access trips because the landings are primarily regulated through the possession limit, rather than the 12 DAS charge. This alternative was not selected as the proposed action. The Council determined that eliminating the crew limit could improve safety and provide more flexibility for vessels, reducing overall fishing costs.

3.3.4 Trip exchange deadline

Limited access scallop vessels are presently allowed to exchange controlled access area trip allocations with another vessel with a similar permit (see CFR §648.60). The exchange program was established in Amendment 10 to mitigate the impacts associated with area-specific allocations on vessels located in distant ports or prefer not to fish in certain areas because of operational difficulties or economic cost. To ensure adequate monitoring and compliance, Amendment 10 required these transactions between vessels to be completed within 90 days of when the allocations are made, with the exchanges remaining in place for the remainder of the fishing year.

3.3.4.1 Preferred alternative: Elimination of the June 1 deadline for controlled access area trip exchanges (proposed action)

Vessels with limited access permits would be allowed to exchange controlled access area trip allocations at any time during the fishing year, on a one-for-one basis with another vessel in a similar permit category. Vessels with full-time permits may exchange trips with another vessel with a full-time permit, part-time permits with another vessel with a part-time permit, and occasional permits with another vessel with an occasional permit.

Rationale: Eliminating the deadline would provide greater flexibility for vessel owners and fishermen to respond to existing conditions. Greater flexibility could allow industry to reduce fishing costs as well as business and safety risk.

This deadline proved to be unnecessary to ensure adequate monitoring and compliance. During 2004, Georges Bank controlled access allocations were made on November 2, 2004 and exchanges were allowed through February 2, 2005, nearly at the end of the fishing year. Through procedures developed by NMFS, monitoring and compliance were satisfactory, even though the exchange deadline occurred at the end of the fishing year. Therefore, eliminating the deadline is the proposed action.

3.3.4.2 Status quo: Require trip exchanges to be completed by June 1, or 90 days after allocations are made

The current regulation would remain in place, requiring Trip Exchange Forms to be completed and submitted by June 1 of each year.

Rationale: The June 1 deadline would be kept if the Council thought that due to concerns about effective administration and processing of requests, that vessel owners should be confined to a 90-day window for applying for exchanges. Based on experience, however, such deadlines appear unnecessary; therefore, the Council decided to recommend eliminating the trip exchange deadline and not selecting this alternative as the proposed action.

3.3.5 Controlled access area trip exchanges

Amendment 10 allowed for limited access scallop vessels to exchange the ability to take trips in controlled access areas, as a way to reduce fishing costs and mitigate the effects of allocating DAS for specific areas which are sometimes very far away from a vessels normal port of operations. Although the scallop fleet is very mobile and vessels often fish both on Georges Bank and in the Mid-Atlantic region, some fishermen prefer to fish in one region or the other due to various types of constraints on a vessel's range and area of operation.

Framework Adjustment 16/39 actually implemented the one-to-one trip exchanges when the Georges Bank access areas opened to scallop fishing, adding to the Hudson Canyon Area that was already open under controlled access fishing rules. During 2004, 48 vessels (24 exchanges) took advantage of this provision to reduce fishing costs and fish trips in preferable locations. The resource in the Hudson Canyon Area changed considerably in 2005, yet 110 vessels (55 exchanges) exchanged trips so far in 2005.

The trip exchange provision in CFR §648.60 would continue in 2006 and 2007 (Status quo). Some vessels will have less opportunity to exchange trips and fish in preferable areas, however, because (except for unused 2005 Hudson Canyon Area trips, see Section 3.3.1.3.1) during 2006 they may not have any controlled access area trips to take in the Mid-Atlantic region. Therefore vessels that primarily fish for scallops in the Mid-Atlantic region may be forced to take Georges Bank access trips, even though they do not have history fishing in the Georges Bank region. In 2007, the framework adjustment anticipates that the Elephant Trunk Area would re-open for controlled access fishing, giving these vessels an allocation to exchange with vessels that prefer to fish on Georges Bank.

3.3.5.1 Preferred alternative: One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk Area trips with another vessel (proposed action)

During the 2006 fishing year, vessels would be able to make a one-to-one exchange trips in the Georges Bank access areas allocated in 2006 for trips to be allocated in 2007 for the Elephant Trunk Area held by another vessel. Since these trips involve controlled access area allocations with different possession limits applying to full-time, part-time, and occasional permits, both vessels must have permits with the same scallop possession limits. For example, a vessel with any type of full-time permit could exchange trips with another vessel holding any type of full-time permit, but could not make exchanges with a vessel with any type of part-time or occasional permit. Consistent with the current rules on trip exchanges in CFR §648.60, unused 2006 Georges Bank access area trips cannot be exchanged during the 2007 fishing year.

NMFS would track the exchanges made during the 2006 fishing year and authorize vessels to make the adjusted number of Elephant Trunk Area trips during the 2007 fishing year. The table below gives some example trades for two full-time scallop vessels.

Table 29. Example one-to-one exchanges among two full-time limited access vessels.

Assuming that vessels are authorized in 2006 to take a maximum of 2 Nantucket Lightship Area (NLSA), 1 Closed Area I (CA1), and 2 Closed Area II (CA2) trips and in 2007 to take a maximum of 1 Nantucket Lightship Area, 1 Closed Area I, and 5 Elephant Trunk Area (ETA) trips

Example exchange	2006 adjusted maximum number of trips			2007 adjusted maximum number of trips		
	Vessel A	Vessel B	Average # of Trips per vessel	Vessel A	Vessel B	Average # of Trips per vessel
Vessel A exchanges 2 CA2 trips with Vessel B for 2 ETA trips	2 NLSA 1 CA1	2 NLSA 1 CA1 4 CA2	2 NLSA 1 CA1 2 CA2	1 NLSA 1 CA1 7 ETA	1 NLSA 1 CA1 3 ETA	1 NLSA 1 CA1 5 ETA
Vessel A exchanges 5 GB trips with Vessel B for 5 ETA trips	No controlled access area trips	4 NLSA 2 CA1 4 CA2	2 NLSA 1 CA1 2 CA2	1 NLSA 1 CA1 10 ETA	1 NLSA 1 CA1	1 NLSA 1 CA1 5 ETA

Rationale: As demonstrated above, the exchanges provide the exchanging vessels more flexibility to fish in preferred areas, without changing the total number of trips allocated in each area during a fishing year. Exchanges therefore have the potential to reduce fishing cost and improve safety, without changing the potential mortality and amount or distribution of fishing effort since each trip is associated with, for full-time vessels, the time it takes to catch and process 18,000 lbs. of scallop landings. Little change in total fishing effort by area or by year is anticipated, thus the Council selected this option as part of the proposed action.

Some vessels are more suited to fish in the Georges Bank access areas than in the Elephant Trunk Area and vice versa. If anything, such exchanges would also make the fleet more efficient in catching the TACs with less fishing effort and environmental impacts. Thus, the Council selected this alternative to be included in the proposed action as one way to liberalize the exchange program.

Particularly as demonstrated in example 2 in the table above, this type of an exchange may have short term costs and benefits to individual vessels. It reduces the total number of trips and amount of landings for a vessel, increasing the allocations and potential landings in the next year, and vice versa. Like the existing exchange system, there is nothing that prevents the exchanging vessel owners from negotiating compensation for the postponed landings, thus mitigating the short term costs for one of the exchanging vessels. Also, if a vessel is in need of extended repair or sinks, this type of inter-annual exchange may allow a vessel to postpone its allocations for a future year when it is more likely to be fishing, even though it may have to travel further to fish the extra Elephant Trunk Area trips. For a vessel that does this but prefers fishing Georges Bank access areas, it might even exchange trips in 2007 to increase its allotment of Georges Bank area trips in that year, without changing the total number of trips that are taken in each area and year.

3.3.5.2 Exchanges of 2006 Georges Bank access trips and open area DAS with another limited access vessel

Vessels with Georges Bank access area trips in 2006 would be able to initiate an exchange with another vessel having the same limited access permit category to receive a certain amount of 2006 open area DAS, at an exchange rate to be fixed at the same rate as applied to open area DAS adjustments from

yellowtail flounder closures. Since the exchange of 12 open area DAS for one controlled access area trip would be inequitable and such a ration is likely to be inaccurate and variable, the amount of the open area DAS exchanged could be negotiated among the exchanging vessels. The table below shows a few examples of the potential exchanges:

Table 30. Example exchanges among two full-time limited access vessels

Assuming that vessels are authorized in 2006 to take a maximum of 2 Nantucket Lightship Area (NLSA), 1 Closed Area I (CA1), and 2 Closed Area II (CA2) trips and 50 open area DAS in 2006.

Example exchange	2006 adjusted maximum number of trips		
	Vessel A	Vessel B	Trips per vessel
Vessel A exchanges 2 CA2 trips with Vessel B for 28 open area DAS	2 NLSA 1 CA1x 78 DAS	2 NLSA 1 CA1 4 CA2 22 DAS	2 NLSA 1 CA1 2 CA2 50 DAS
Vessel A exchanges 5 GB trips with Vessel B 50 open area DAS (plus compensation)	No controlled access area trips 100 DAS	4 NLSA 2 CA1 4 CA2 0 DAS	2 NLSA 1 CA1 2 CA2 50 DAS

Rationale: The exchange program would increase flexibility for vessels to fish where conditions are most suitable. Even vessels that prefer to fish in open areas rather than on controlled access area trips could do so. And even though the exchanging vessels could negotiate their own DAS/trip ratio, or tradeoff, the total number of trips by area and open area DAS would be preserved. This type of exchange program would also keep the exchanges within the same fishing year, enabling NMFS to make new allocations in 2007 at the same level for all vessels within a similar permit category.

Unlike the alternative above, exchanges involving open area DAS have the potential to increase fishing effort and scallop mortality in the open areas by some amount. Since catches on open area DAS trips are unlimited, decreases in fishing time because the vessel is fishing closer to port, or is more efficient at scallop fishing in open areas than the vessel giving away the open area DAS could increase the fishing power of an open area DAS, compared to the amount if no exchange had taken place. It would have the potential to alter the historic ratio between fishing power and a DAS (as a function of exploitable scallop biomass and scallop size) that the PDT relies on to estimate the allowable open area DAS allocations. Unless an adjustment is made, exchanges involving open area DAS could risk increasing scallop fishing mortality and causing overfishing to occur, thus the Council did not select this alternative as part of the proposed action.

3.3.5.3 Preferred alternative: One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon Area trips authorized to be used in the 2006 fishing year (proposed action)

This alternative is part of the Hudson Canyon Area management alternative described in Section 3.3.1.3. Since the Council approved the alternative allowing unused 2005 Hudson Canyon Area trips to be carried forward for up to two years, this allows vessels to exchange these trips with another vessel having Georges Bank trips to exchange in either 2006 or 2007. Trades must be done within the year that the Georges Bank trips are allocated.

3.3.5.4 Preferred alternative: One to one exchanges of controlled access area trips for controlled access area trips open to fishing during the same fishing year (Status quo) (proposed action)

The exchange program described in CFR §648.60 would continue, allowing vessels to exchange the amount of trips that they are authorized to take in the Georges Bank access areas in 2006, and in the Georges Bank access areas and the Elephant Trunk Area in 2007. Other than exchanging unused 2005 Hudson Canyon Area trips during 2006 (see Section 3.3.1.3), there would be no opportunity to exchange a controlled access area trip in the Mid-Atlantic region for one on Georges Bank.

Rationale: This alternative would not require changes in the regulations to allow exchanges between yearly allocations. At least for vessels with unused Hudson Canyon Area trips from 2005 (see Section 3.3.1.3.1), there would be an opportunity to exchange trips in the Mid-Atlantic region for those on Georges Bank, and vice versa. It might even provide some incentive for vessels to take fewer Hudson Canyon Area trips in 2005, saving them to obtain more Georges Bank access area trips in 2006; therefore, this option is part of the proposed action as well.

3.3.6 Broken trip exemption program

The broken trip exemption program allows vessels that return to port on a controlled access area trip to catch the remaining portion at a later date on a compensation trip. The original trip may return early and land less than the possession limit for any reason, including bad weather, mechanical breakdown, or a medical emergency. If fishermen are under the threat of losing landings by returning early, it could lead to unsound judgments by fishermen which increases safety risks.

Framework Adjustment 17 liberalized the program to remove the disincentive that was formerly associated with the formula that determined how much scallops could be landed on a compensation trip. The compensation trips must be taken in the same fishing year as the broken trip occurred, however, increasing the safety and business risk associated with controlled access area trips taken near the end of the fishing year. At the end of the fishing year, the opportunity to take a compensation trip may be limited due to conditions during the last few weeks or months of a fishing year, and therefore a vessel risks losing authorized landings from controlled access area trips.

3.3.6.1 60-day carry forward of compensation trips (proposed action)

Compensation trips and authorized landings for broken trips that occur during the last 60 days of seasonal or year-around access to a controlled access area may be taken during the first 60 days when the same area is open to scallop fishing during the following fishing year. If the area does not re-open to fishing during the next fishing year, the compensation trip cannot be carried forward into the next fishing year.

Rationale: This alternative would liberalize the broken trip exemption program, reducing the risk associated with trips taken at the end of a fishing year, or at the end of a seasonal access program. See Section 3.1.9 for additional rationale for the Council selecting this alternative as the proposed action.

3.3.6.2 Status quo: No carry forward of compensation trips

All broken trip exemption program compensation trips must be taken in the year that the broken trip occurs. These compensation trips are subject to seasonal access and closures that govern whether fishing in an area can occur.

Rationale: This alternative does not jeopardize the ability of the FMP to achieve the annual fishing mortality targets for controlled access areas. However, it is not as flexible as the alternative described above; therefore, the Council does not recommend this as the proposed action

3.3.7 Research set-aside program (none selected for proposed action)

Two percent of controlled access area TACs and two percent of open area DAS are set-aside, i.e. not allocated to the fishery, for funding scallop-related research through compensation trips. Researchers submit proposals to do scallop-related research using these funds and contract with commercial scallop vessels for ship time for research as well as for catching and landing the scallops on compensation trips. Sometimes the compensation trip and the research are done at the same time, on the same vessel. Sometimes the compensation trip is conducted at another time during the fishing year. Trips and landings on compensation trips do not count against the vessels annual fishery allocations. All allocations are made for a fishing year and the research as well as the compensation must be completed before the end of the fishing year.

The Council decided that none of the changes to the research set-aside program considered in this action are ready to be implemented. More work is needed to specify the details of the modifications considered.

3.3.7.1 Compensation for multi-year research projects (RSA management issue #1)

Compensation trips for multi-year projects would be allowed at any time during the duration of the approved project. Research may be conducted in one year and the compensation trip to pay for that research could occur in that fishing year or a subsequent fishing year before the end of the research project term. Compensation trips for research to be conducted in a future year would not be allowed.

Rationale: This change might allow more research to occur over a broader range of time, without being restricted by when the compensation trip takes place.

3.3.7.2 Disposition of unused research set-asides (RSA management issue #2)

At the present time, unused research set-asides are not re-allocated to the fishery or to future scallop related research projects. The unused portion of the RSA reduces mortality and causes scallop biomass to be higher in the next year than would otherwise occur. Theoretically, about 17% of the scallops that are not harvested are re-allocated to the fishery in the next fishing year, plus fractionally less through time. The amount of biomass it represents in future years depends on the scallops' rate of growth and meat yield.

Other choices would bring a more immediate return for those scallops that had already been allocated, as a component of optimum yield. This would benefit either scallop research or the scallop industry and realize more immediate net benefits from the unused allocation.

3.3.7.2.1 Re-distribute through a second RFP for the current year

If unused RSA exists because the total from funded and approved projects is less than the two percent set-aside, a secondary RFP would be considered, either for unapproved project resubmission and/or for new projects.

Rationale: Although timing of a second RFP to fund projects in the same fishing year is difficult, the secondary RFP could enable researchers to conduct a more full range of research projects, particularly if the compensation trip can be taken in the next fishing year (Section 3.3.7.1).

3.3.7.2.2 Set up RSA funding like a bank account and roll unused amounts into subsequent fishing years

Unused RSA allocations would be included in the following year's set aside specifications and added onto the two percent made available in the next fishing year.

Rationale: Biological projections and specification estimates already account for the associated catch for the year when a framework adjustment is developed. The additional mortality that it would create is marginal and may be mitigated by scallop growth.

3.3.7.2.3 Re-allocate TAC/DAS to industry during the current fishing year

Unused TAC and DAS would be added to the fishing industry allocations and distributed on a pro rata basis amongst vessels that are authorized to fish for scallops. In the open areas, a whole number of DAS would be added to each vessel allocation based on the same formulae that was used to distribute allowable DAS amongst vessels with scallop permits. In controlled access areas, the TAC for the fishing fleet would increase, but would probably not change the number of trips that can be allocated to each vessel, unless due to rounding it changes the number of trips that would be allocated according to the formulae that were used to make the original fleet allocations of controlled access area trips.

Rationale: This approach would be consistent with the allocation methods that would have been used if there was less RSA funds allocated as a proportion of the TAC. Benefits would accrue directly to the nation and the scallop industry in the same fishing year.

3.3.7.2.4 Allow Experimental Fisheries with harvest levels consistent with the amount of RSA left to be approved (with appropriate NEPA analyses submitted in application)

Landings of scallops associated with unused RSA could be re-allocated to experimental fisheries that occur after research projects had been approved. Proponents could apply for an experimental fishery that occurs outside of the scallop DAS or controlled access area program (i.e. not on a DAS), without needing to show that the additional scallop mortality does not threaten the FMP's ability to achieve optimum yield and prevent overfishing. Proponents would need to provide analysis to show that the effects on the environment do not exceed those associated with a standard, equivalent commercial scallop DAS.

Rationale: Such a transfer might be used to conduct research and collect data via an experimental fishery, without going through the competitive bidding process associated with RSA research. This might allow a fundamentally different kind of experimentation to take place without threatening the ability of the FMP to achieve optimum yield and prevent overfishing.

3.3.7.3 Cooperative survey dedicated set-aside (RSA management issue #3)

Up to half of the two-percent research set-aside would be dedicated for use in cooperative industry scallop surveys. Using these funds to generate revenue to compensate vessels participating in the program, NMFS would work with the fishing industry to develop surveys where they are needed.

NMFS will initiate a cooperative industry scallop survey, primarily designed to assist in estimating the distribution and biomass of scallops in specific areas, as needed to provide information for rotation area management. Vessel compensation and direct administrative costs of this survey are to be recaptured from a two percent set aside to fund research and resource monitoring. Two percent of the controlled area TACs and two percent of the allowable open area days used will be deducted before

calculating the controlled access trip and open area DAS allocations. The Regional Administrator will authorize vessels that participate in the cooperative surveys to make compensation trips to defray the costs of the vessel's participation. The Regional Administrator will specify whether and for how long a vessel may fish in a controlled access area or open area to recoup the costs, based on the expected scallop catch per day and price per pound. A compensation trip is one in which the Regional Administrator authorizes the vessel to fish for scallops while not on the DAS clock or one in which the vessel is authorized to land more than a scallop possession limit that applies to a controlled access area. Resource surveys under this program shall be deemed scientific research under the Magnuson Act. Surveys and compensation trips that do not adversely affect the environment beyond those associated with a scallop DAS will not require an experimental fishing permit.

Cooperative surveys may target areas reported to have high concentrations of small scallops to determine the potential boundaries of a rotation management area closure, and/or to more accurately determine the biomass of a closed rotation management area about to re-open. The latter case may be anticipated, but small scallops may appear suddenly and an ad hoc survey may be needed. As such, the Regional Administrator is encouraged to develop administrative procedures for conducting an ad hoc resource survey using industry vessels and pre-arrange participation in such a survey, should the need arise.

Scientific personnel on industry vessels may be NMFS employees, state employees, or university employees. The added costs of these scientific personnel for their time aboard survey vessels and/or preparing the data for analysis may be recovered from scallop compensation trips by charging the vessel that participated in the survey and recovered survey costs via compensation trips.

Rationale: Industry-funded and supported resource surveys are needed to increase the sampling intensity and support area rotation, especially if many small areas need to be evaluated to close or open rotation management areas. NMFS disapproved of this measure because it lacked a secure funding mechanism. This alternative would dedicate part of the RSA for conducting cooperative industry surveys. At the present time, these programs have not been developed (because in Amendment 10 they were not approved) and it is unclear how much funding will be needed until the surveys have been more fully developed. Dedicating up to ½ of the RSA funding to develop and conduct cooperative industry surveys should be sufficient provide sufficient funding.

3.3.7.4 Allowance of combination research/compensation trips in areas closed to scallop fishing (RSA management issue # 4)

Where research in a closed area is necessary, the FMP would allow vessels to take combined compensation and research trips. Researchers must analyze and justify the environmental effects on species other than scallops and on habitat in the closed area.

Rationale: This alternative would reduce the cost of doing research in closed areas, since a separate compensation trip in a different area would not be necessary. Scallop mortality in closed areas from this transfer could be a small fraction of the total biomass in the area.

3.3.7.5 Status quo

Only administrative changes would occur to improve the RSA proposal and review process, enabling scientific research to occur earlier in the fishing year.

Rationale: Multi-year and cooperative industry surveys should occur through annual applications for funding. The current program ensures that the total scallop catches do not exceed optimum yield and

unused scallop allocations do not contribute to scallop mortality, increasing the scallop biomass that would otherwise be available in subsequent fishing years.

3.4 Considered and Rejected Alternatives

During the development and scoping of Framework 18, the following alternatives were considered and rejected due to prima facie evidence or initial analysis that showed undesirable effects.

3.4.1 General Category Measures

As stated in Section 2.1, Purpose and Need for Action, the Council considered and rejected measures using effort or input controls, because any such measures would affect traditional participants as much as vessels that recently ramped up scallop fishing effort or newly entered the general category scallop fishery. The only acceptable methods that would have a differential effect on new entrants and mortality caused by general category fishing seemed to be setting a TAC and establishing limited access based on the November 2004 control date. Setting a TAC and establishing limited access would be a new management approach and raise concerns about proportional allocations. The Council determined that such actions would be addressed more comprehensively in an amendment, developed immediately after this framework action is completed. Given that the measures that could be considered in this framework action could not absolutely control mortality and because of the analytical requirements and uncertainties, the Council and NOAA Fisheries thought that the benefits of taking the limited actions that could be implemented through a framework, would not outweigh the costs.

Below is a list of the actions the Council considered and rejected for the reasons stated above:

3.4.1.1 Limited entry and a permit moratorium

Vessels would be authorized to continue fishing for scallops under general category rules, if the vessel met specific qualification criteria (usually based on proof of historic landings and/or fishing effort exceeding certain thresholds). Except for these qualifying vessels, no further general category scallop permits would be issued.

3.4.1.2 Fleet quotas

A limit on total catch would be set, either by region, by season, or as an annual limit for the entire range. Once landings by vessels with general category scallop permits reached the quota (hard TAC), vessels would not be authorized to take scallop trips or land more than a nominal amount of scallops as bycatch.

3.4.1.3 Possession limit time period

Instead of allowing vessels with general category permits, or a limited access vessel not on a scallop DAS, to land up to 400 lbs. in a 24-hour period, the rule would be changed such that a vessel would be allowed to land no more than 400 lbs. in any 48, 72, or 96-hour period.

3.4.1.4 Limiting number of scallop trips per week

A vessel with a general category scallop permit, or a limited access vessel not on a scallop DAS, would be able to land scallops on a limited number of trips per week, ranging from 2 to 5 trips.

3.4.1.5 Effort controls via landings windows

Vessels fishing for scallops under general category rules would be able to land scallops with a limited frequency or during a limited period of time each week. Options include allowing a vessel to land 400 lbs. once during a period longer than the current 24 hour limit, allowing vessels to land scallops for a limited number of trips per week, or allowing scallop trips to be landed only during certain times. For example, the rules might allow a vessel to land 400 lbs. once during 48, 72, or 96 hours. The rules might allow a vessel to land 400 lbs. of scallops only two or three times per week. Or the rules might allow a vessel to land scallops only during Monday to Thursday.

3.4.1.5.1 Ten and one-half foot maximum dredge width and prohibit the use of trawls on a general category scallop trip

Vessels declaring that it is on a scallop trip (hence being able to land between 40 and 400 lbs. of scallop meats) would be required to have a dredges no more than 10.5 feet in total width. A scallop trip is defined as a vessel declaring it is on a trip by VMS macro code, while not on a scallop, groundfish, or monkfish DAS. This measure would apply throughout the range. Vessels could not use a scallop trawl on a declared scallop trip, implying under the final rule for Framework 17 that a vessel using a trawl could land and possess no more than 40 lbs. of scallop meats (5 US bu.), unless it were on a scallop, groundfish, or monkfish DAS.

3.4.1.6 Ten and one-half foot maximum dredge width and a scallop bycatch allowance for vessels using trawls

Vessels declaring that it is on a scallop trip (hence being able to land between 40 and 400 lbs. of scallop meats) would be able to carry scallop dredges onboard of no more than 10.5 in total width. Except for vessels on a scallop, groundfish, or monkfish DAS, the scallop possession limit for vessels with other gears (trawls, clam dredges, etc.) onboard would be no more than 10% of the total landed catch of other marine species or 400 lbs. of scallop meats, whichever is less.

3.4.1.7 Status quo: Other than in areas which require NE Multispecies FMP exemptions, maximum 31 foot dredge width, 144 foot trawl sweep

The regulations at CFR §648.51 specify that scallop dredges shall not exceed 31 feet in combined, total width and that scallop trawls may not exceed 144 feet combined, total foot rope sweep. Regulations at CFR §648.80 also require scallop dredges to be no more than 10.5 feet in total width and scallop trawls may not be used, while not fishing on a DAS in specific areas in the Gulf of Maine and Southern New England. The exempted area regulations are intended to minimize the adverse impacts on groundfish caused by scallop fishing vessels that are not on a DAS.

3.4.1.8 Crew limits (range 3 to 5 persons)

Vessels on a scallop trip fishing under general category rules would be limited to a certain number of persons onboard the vessel, while not on a scallop, multispecies, or monkfish DAS and while having a scallop dredge or trawl aboard. This limit may be either 3, 4, or 5 persons, including the captain.

3.4.1.9 Maximum number of general category scallop trips

Vessels having general category scallop permits and limited access scallop vessels would be limited to a specific number of trips landing more than 40 lbs. of scallops (5 US bushels shell stock). The total number of general category scallop trips that a vessel may take during a fishing year (May 1 to April 30 for vessels having general category permits; March 1 to February 28/29 for vessels with limited access permits) would be limited to a specific amount. The Council may choose and NMFS may approve a limit

within a 30 to 60 trip range, depending on the measure's effectiveness in keeping landings within 2 to 5 percent of annual optimum yield. This measure may be combined with a change in the scallop possession limit, described in Section 3.4.1.10.

3.4.1.10 Scallop possession limit adjustment

The maximum amount of scallop landings that a vessel with a general category permit or a limited access vessel not on a scallop DAS may possess, or land within a 24 hour period, would be adjusted to between 200 and 400 lbs. of scallop meats (25 to 50 US bushels).

3.4.2 Hudson Canyon Area Rotation Measures

3.4.2.1 Allow vessels to take unused 2005 Hudson Canyon Area trips during 2006 in the Georges Bank controlled access areas

Vessels would be able to take trips in one or more of the Georges Bank controlled access areas during 2006 on a one for one basis for each 2005 Hudson Canyon Area trip that was not taken. Either the 2006 Georges Bank area allocations would be reduced to compensate for the relocated fishing effort, or the additional trips would be added onto the 2006 base allocations, calculated to achieve optimum yield.

Rationale: This alternative was considered and rejected because of two potential effects. If the 2006 base allocations for the Georges Bank areas are adjusted to account for the trips transferred from the Hudson Canyon Area, the measure would create inequities for vessels that had taken all three Hudson Canyon Area trips during 2005. With the adjustment, vessels would have been allowed to take fewer trips during 2005 and 2006 than would vessels that were authorized to take some of the Hudson Canyon Area trips in the Georges Bank access areas during 2006. The base allocation adjustment would also be difficult to estimate at this time, because the amount of trips that would be transferred to the Georges Bank areas would be unknown.

If the base allocations are not adjusted and the unused Hudson Canyon Area trips add fishing effort in the Georges Bank access areas, then fishing mortality may exceed the Council's goals for achieving optimum yield, taking into account effects on habitat and bycatch. The additional trips may also contribute to the yellowtail flounder catches, causing the areas to close earlier than they otherwise would under the 10% TAC for yellowtail flounder.

3.4.2.2 Allow vessels to take unused 2005 Hudson Canyon Area trips during 2006 in open fishing areas

Vessels with unused 2005 Hudson Canyon Area trips would be authorized to take an equivalent number of DAS (or some other value as a tradeoff) in the open fishing areas during 2006.

Rationale: This alternative would not provide as much flexibility and benefit to the fishery as allowing the unused trips to be taken in both 2006 and 2007. Also scallops in the Hudson Canyon Area would have an additional year to grow, thereby increasing yield per recruit, delaying fishing mortality and increasing economic efficiency.

3.4.2.3 Close the Hudson Canyon Area to scallop fishing during 2006 and 2007

All vessels would be prohibited from fishing for scallops in the Hudson Canyon Area during 2006 and 2007. Scallop possession would be prohibited in the area, unless fishing gear is properly stowed.

Rationale: The primary purpose of closing areas to scallop fishing under rotation area management policies is to protect abundant year classes of small scallops. Since this condition has not been recently observed in the Hudson Canyon Area, it would be inappropriate to close the area to fishing

3.4.3 Elephant Trunk Area (ETA) Rotation Measures

The Council initially contemplated trip allocations by season to ensure that the ETA trips are not taken all at once, having undesirable effects on scallop markets and the environment. This type of approach was successfully applied to the Georges Bank access program in 1999 and 2000. Doing so proved to be an unnecessary complication with added administrative and compliance costs, because the fleet naturally spaced the trips out over time. Split-season trip allocations would also be an unnecessary complication and restriction particularly if a seasonal closure is selected to address sea turtle and discard mortality concerns.

3.4.3.1 Split-season trip allocations

Limited access and general category vessels would be able to take one-half of the allocated ETA trips in the first part of the seasons described above and the other half in the second part of the season.

Rationale: This measure would constrain scallop vessels from optimizing market conditions, weather and other fishing opportunities, which are different for each vessel.

3.4.3.2 Unrestricted trip allocations

Like the allocations for the Hudson Canyon Area in 2004 and 2005, vessels would be able to take the ETA trips at any time during the fishing year, subject to seasonal closures described above.

Rationale: This measure does not consider the need to protect sea turtles that are more prevalent in the ETA in the summer and fall.

3.4.4 Controlled access area trip exchanges

During scoping, some other approaches were considered to address the situation in 2006 when Mid-Atlantic vessels may be forced to fish in the Georges Bank access areas. They were rejected based on undesirable implications that were apparent when they were evaluated, or because there was insufficient time to take them up in a framework adjustment.

3.4.4.1 DAS leasing

Vessels would be able to temporarily lease controlled access area trips to another vessel, based on the program that was approved in Amendment 13 to the Multispecies FMP. All leases would expire at the end of the fishing year.

Rationale: This alternative was rejected because as a framework adjustment measure, the regulations require a full set of public hearings, for which there was insufficient time between when the measure was suggested for consideration and the final framework meeting. Furthermore, the procedures and regulations for multispecies vessels may not be applicable to temporary transfers of scallop trips, therefore time would be needed to develop a viable program tailored to the requirements for the scallop fishery and area-based management.

3.4.4.2 Default open area DAS

Similar to the DAS regulations in 2004, vessels electing not to take Georges Bank controlled access area trips would be allocated an additional number of open area DAS which would be associated with an equal amount of fishing mortality in the controlled access areas.

Rationale: This alternative was rejected because the default DAS allocations in 2004 increased fishing effort in the open areas and was a significant factor causing overfishing to occur. Although vessels received only 20 DAS in place of three Georges Bank area trips (36 DAS), the program increased mortality on scallops in the open areas more than the pre-established tradeoff ratio. This problem occurred partly because most fishing effort associated with the default DAS allocations was directed in the Mid-Atlantic region creating a greater imbalance in open area effort between the Mid-Atlantic and Georges Bank regions. This imbalance of effort in the Mid-Atlantic region where scallops were relatively more abundant caused overall fishing mortality to be higher than it would be had the effort been displaced to the open areas in the Georges Bank region. Furthermore, more open area DAS in the Mid-Atlantic would have the potential for increased interactions with sea turtles.

3.4.5 Research set-aside program

3.4.5.1 Experimental fishing in closed areas

This alternative would set policy to guide NMFS in its decisions about what type of EFPs to approve, when the intended experimental fishing activities are proposed for an area presently closed to fishing. Certain types of research has been proposed through the EFP process to involve the industry and gather enough data to determine whether a certain style or method of commercial fishing can be done without unacceptable consequences. Generally, these applications go against the intended purpose of a closed area, i.e. to prohibit certain types of fishing. Unless there is another mechanism for collecting experimental fisheries data, important data for expanding access seasons and areas, possibly using modified gears cannot be collected.

Rationale: This alternative was considered and rejected for this scallop framework, because it requires a broader level of considerations over all FMPs.

4.0 DESCRIPTION OF AFFECTED ENVIRONMENT (2005 SAFE REPORT)

The environment affected by the sea scallop fishery as a whole is described in section 7 of Amendment 10 to the Sea Scallop FMP (NEFMC 2003). That description is incorporated herein by reference. This section serves as the 2005 SAFE Report, which updates the data and analysis of the fishery through the 2004 fishing year, including the update assessment of the scallop resource, new estimates on safety trends, new analyses of limited access scallop effort distribution, and new estimates of finfish bycatch in both the controlled access and open areas. The 2005 SAFE Report also includes several relevant appendices (*Appendix I: Economic and Social Trends in the Sea Scallop Fishery, Appendix II: Methods Used for Sea Scallop Biological Projections, Appendix III: Total Bycatch Estimate of Loggerhead Turtles in the 2004 Atlantic Sea Scallop Dredge Fishery, Appendix IV: Summary of 2005 Sea Safety Information for the First Coast Guard District, and Appendix V: Methods and Detailed Analysis of Finfish Bycatch in the Scallop Access Programs*).

4.1 The Atlantic Sea Scallop Resource

The biological environment potentially affected by this action includes fishery resources. This section will focus on those fishery resources for which data are readily available, namely those targeted by commercial fisheries.

The management unit for the Scallop FMP consists of the sea scallop resource throughout its range in waters under the jurisdiction of the U.S. The five resource areas generally recognized within the management unit are: (1) Delmarva; (2) New York Bight; (3) South Channel and southeast part of Georges Bank; (4) Northeast peak and the northern part of Georges Bank; and (5) the Gulf of Maine. The Delmarva area includes scallops as far south as North Carolina (NEFMC 2003).

The Atlantic sea scallop (*Placopecten magellanicus* (Gmelin)) is a bivalve mollusk distributed along the continental shelf, typically on sand and gravel bottoms, from North Carolina to the north coast of the Gulf of St. Lawrence (Packer et al. 1999). Large concentrations of sea scallops are found on Georges Bank and the mid-Atlantic shelf, while smaller concentrations are found along coastal Maine, in the Bay of Fundy (Digby grounds), in the Gulf of St. Lawrence, on St. Pierre Bank, and in Port au Port Bay, Newfoundland (NEFMC 2003).

Atlantic sea scallops generally inhabit depths of 18–110 m but are most abundant on the continental shelf between 20 and 50 m. On occasion, they have been found at depths up to 384 m (NEFMC 2003). In the mid-Atlantic, concentrations occur within a narrow depth band from about the 40 to the 200 m isobath, throughout the Hudson Canyon Area, and around the perimeter of Georges Bank, including the Great South Channel (NEFMC 2001). In mid-Atlantic waters, most scallops are harvested at depths of 30–100 m (NMFS 2004c).

Sea scallop abundance and biomass in the mid-Atlantic are currently at record-high levels (NMFS 2004c). For closed areas in the mid-Atlantic, abundance and biomass indices showed notable increases after the closure. In areas of the mid-Atlantic open to fishing, the biomass and abundance have increased since 1999, largely due to good recruitment over the last several years. In addition, increased yield-per-recruit due to effort reduction measures has contributed to high landings. During 2003, sea scallops were not overfished, but overfishing was occurring (NMFS 2004c).

The Scallop PDT updated the assessment of the scallop stock, using 2004 survey data, 2004 commercial catches, and methods that were reviewed and approved by the 32nd Stock Assessment

Workshop. This assessment covered a period when the new regulations under Amendment 10 were only partially implemented and Framework Adjustment 16/39 was implemented in November 2004. The Scallop PDT Report is summarized in the paragraphs below, and the entire report is attached to this document, *Appendix VI: Updated Scallop Assessment*.

Based on the updated assessment, the Scallop PDT found that in 2004 overfishing was occurring, i.e. the fishing mortality rate ($F=0.35$) was above the maximum mortality threshold ($F=0.24$) and significantly above the target ($F=0.20$). According to the analysis, fishing mortality was expected to decline to the threshold in 2005 as Amendment 10 regulations became fully effective. Biomass in the 2005 survey was a little less than the 2004 survey and landings appear that they will be somewhat above the target. This suggests that fishing mortality could be again somewhat above the threshold in 2005 and overfishing will continue.

On the other hand, biomass in 2004 rose to a record, 54% above the 5.6 kg per survey tow target. This biomass increase has occurred in both the Mid-Atlantic and Georges Bank regions, and in both closed and open areas. In 2004, Mid-Atlantic declined by about 4% from 2003 while Georges Bank biomass increased by 34% largely from the above average 2000 year class in Closed Area II access area.

Despite the high fishing mortality, the resource remains in very good condition, with a greater share of the landings coming from older and larger scallops. Two very strong year classes are now protected by the Elephant Trunk Area (ETA) closure and higher sustainable yield is forecasted with a potential for a modest increase in total DAS use, particularly when the benefits of the ETA closure are realized in 2007. A gradual shift in open area effort toward the Georges Bank region is forecasted from projected catch rates and could also help bring mortality down.

4.1.1 Biomass

Scallop biomass in the Georges Bank and Mid-Atlantic regions (which together account for 90-95% of scallop landings) has increased substantially from the depleted condition (< 1 kg/tow) that existed before 1998 and in 2004 was 54% above the target. Since 1997, scallop biomass increased first in the Georges Bank region (Figure 1) mostly as a result of the growth of scallops in the three groundfish closed areas. Biomass reached 8 kg/tow by 2000 and has since leveled off. Biomass peaked at 9.6 kg/tow in 2004 and declined to 7.6 kg/tow in 2005.

Increases of biomass in the Mid-Atlantic region began in 1999 and 2000 (Figure 1), resulting from a strong 1997 year class which was partially protected by the 1998-2000 HCA closure. Although the Hudson Canyon Area (HCA) reopened as a controlled access area in 2001, Mid-Atlantic biomass has continued increasing as a result of above average recruitment coupled with better size selection by the fishery and gear. Two year classes (2002-2003) are partially protected by the ETA closure, which will continue to add to stock biomass through 2007. Another above average year class has appeared in the 2005 survey south of the ETA and may benefit from a scallop closure.

Overall biomass has increased almost without interruption since 1997. Overall biomass was 8.2 kg/tow, 54% above the target. Biomass in 2005 declined by 5% to 7.8 kg/tow, which is probably not statistically significant.

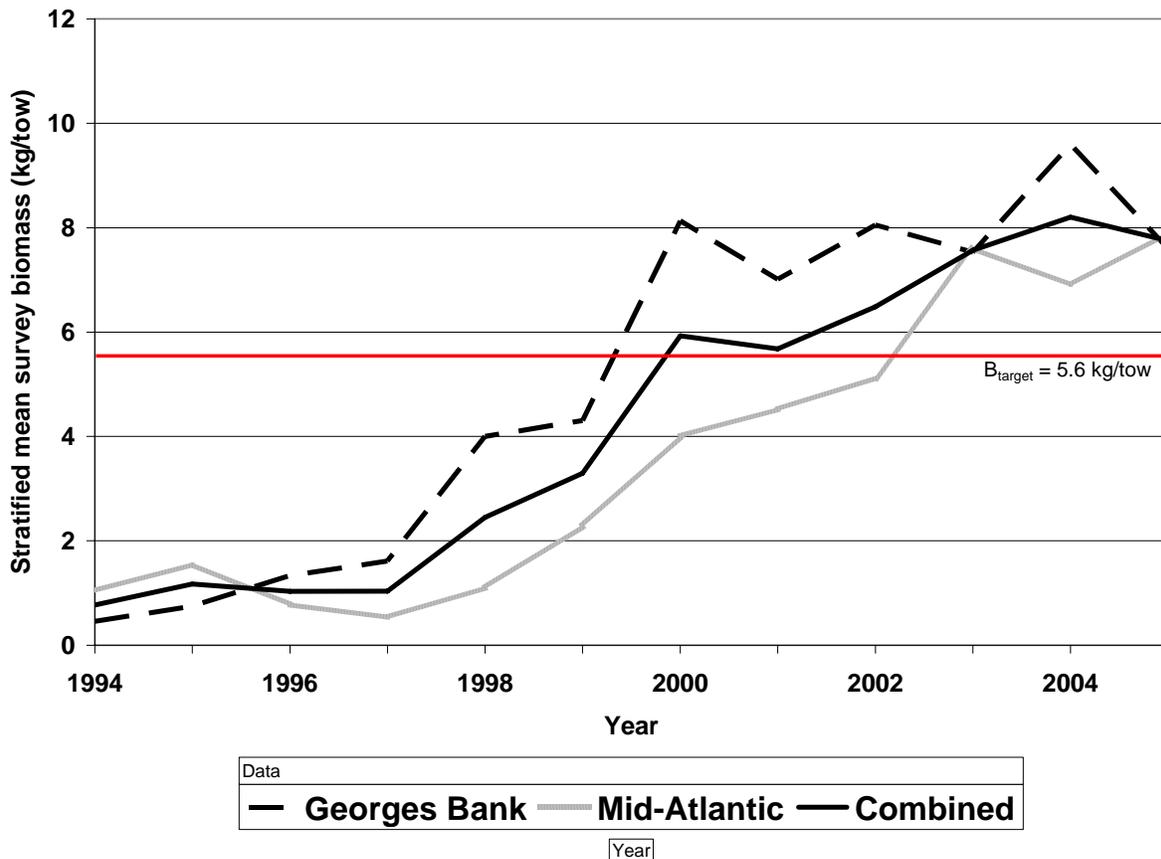


Figure 1. Trend in R/V Albatross stratified mean weight per tow, 1994-2005 (preliminary), by region. B_{target} is identified by the FMP as B_{MSY} and is calculated as the biomass that would result from average scallop recruitment and fishing at F_{max}

4.1.2 Fishing mortality

Trends in fishing mortality show a similar pattern as DAS use (Figure 2), but has not increased to the same degree as DAS use in recent years, because of the effects of crew size, gear restrictions, and area rotation. Fishing mortality declined from high levels near 1.0 (60% annual exploitation) before 1994 to near the maximum threshold ($F=0.24$) in 1998-2000. Since then, fishing mortality has gradually increased to 0.35 in 2004 (Figure 3).

Georges Bank fishing mortality has been well below the threshold and target since 1998, partly from the effect of the groundfish closed areas but also due to the high scallop productivity in the Mid-Atlantic causing catch rates there to be higher, attracting 70-80% of total fishing effort. Mortality in the Mid-Atlantic region, has for the same reasons, remained stubbornly high, fluctuating between 0.4 and 0.6 from 1999-2003 (Figure 3). In 2004, fishing mortality increased to 0.67. The Scallop PDT attributed this increase to a number of factors, including management effects which caused the fishery to use more effort in the spring before Amendment 10 regulations took hold.

Although Amendment 10 and Framework 16/39 were intended to bring fishing mortality down to the target ($F=0.32$), early indications suggest that fishing mortality in 2005 will likely be above the

threshold, but not as high as they were in 2004. Landings appear that they will exceed the 54 million pounds target and biomass declined by 5%, suggesting that mortality will be a bit higher than previously forecast.

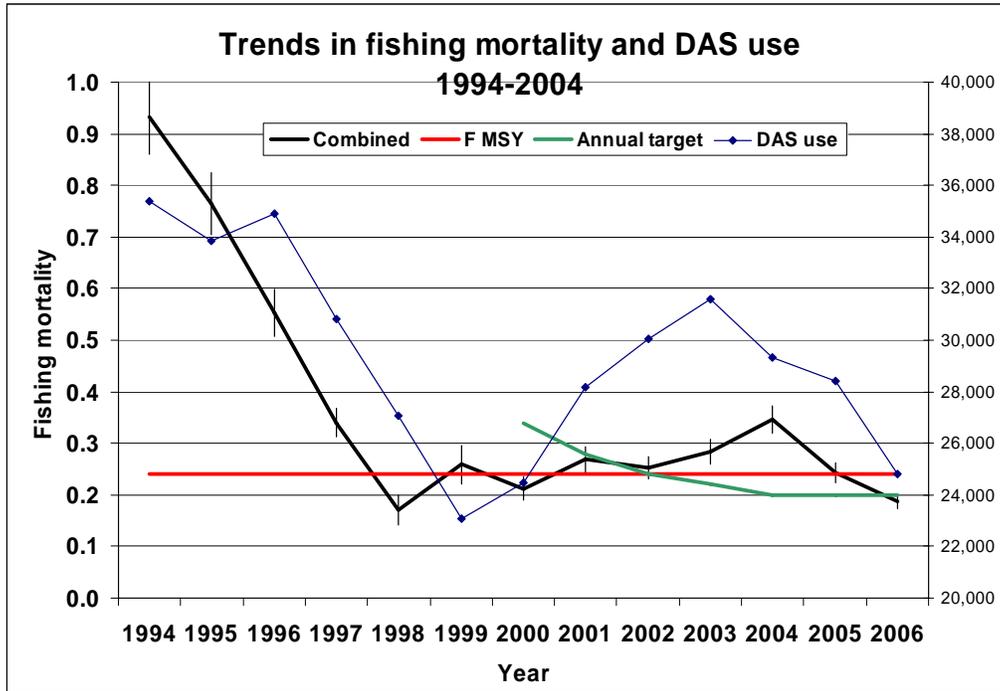


Figure 2. Estimated and projected trends in DAS use and fishing mortality.

Trends in fishing mortality, 1982-2004

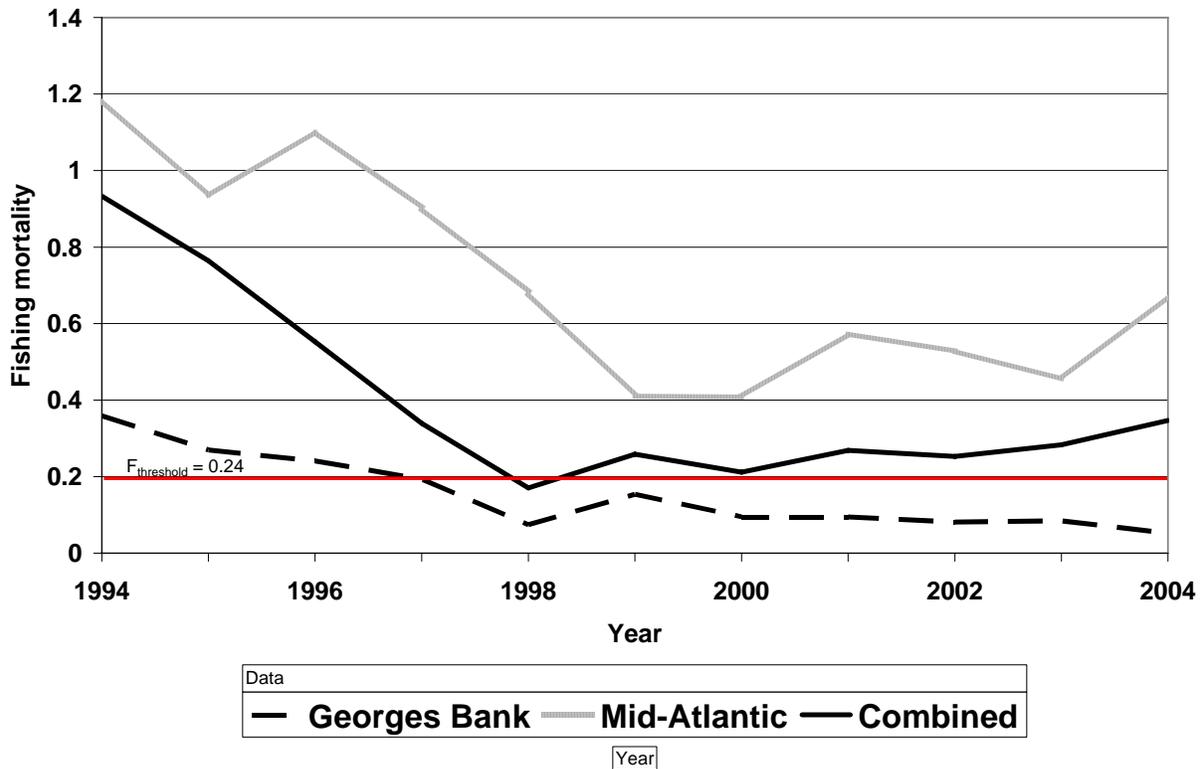


Figure 3. Trend in fishing mortality, 1994-2004, by region. $F_{\text{threshold}}$ is identified as F_{max} , a fishing mortality rate that maximizes yield-per-recruit.

4.2 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 scallops fishery on bycatch has 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 scallops (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 did not occur until December 2004, however. Amendment 10 also estimated that the reductions in open area DAS would also reduce total area swept and increase scallop LPUE, particularly of 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 minimize 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 the access areas is very low compared with fishing time in open areas. 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 a level that the Groundfish PDT identified as having a possible repercussion for meeting the groundfish mortality targets and having an effect on rebuilding overfished groundfish stocks. Many of the impacts are expected to be similar for Framework 18 since this action proposes specifications for rotational area management in similar areas for fishing years 2006 and 2007.

Groundfish Mortality Closed Areas

The groundfish closed areas were originally established to reduce the effects of fishing on spawning cod and haddock, in particular Closed Areas I and II. Peak spawning activity occurs in February to April, coinciding with the original seasonal closures. After spawning, these fish often disperse to other areas during their annual migration. 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 proposed access areas in Closed Areas I and II. Unlike spawning cod and haddock, however, yellowtail flounder tend to remain 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 FSEIS for Amendment 13 to the Multispecies FMP.

The biological characteristics of other species found in the groundfish closed areas and the proposed access areas can be found in the Skate FMP and Monkfish FMP EIS documents. In general, several skate species are often found in the proposed access areas. The Skate FMP identified the conservation associated with the groundfish closed areas to be an important component of limiting mortality on skates, which is a major reason why a skate baseline review was initiated for this framework adjustment (Section 6.1.3.1). Although monkfish inhabit and are caught in the groundfish closed areas, the center of the monkfish distribution is in the Gulf of Maine to the north, and in deeper waters off Southern New England to the west.

New Information

Appendix V of this document summarizes the spatial and temporal distribution of observed hauls and also summarizes the mean catch rates (lbs/hr) of commonly observed species in scallop dredge incidental catches. Recently, NMFS has increased sea sampling on trips made by scallop vessels using dredges. Since 1999, sea sampling in access areas had been enhanced by an industry-funded TAC set-aside program. During this time, 584 scallop trips and 31,230 tows had been observed (see Appendix V). The data from this program was very useful to estimate total bycatch in access areas. NMFS also increased sampling on open area trips, particularly in the Mid-Atlantic, in response to new observations of interactions with sea turtles in the Hudson Canyon Area (on access area trips using observers funded by the TAC set-aside). Sampling increased from 26 trips and 1,348 tows in 2002 to 77 trips and 4,896 tows

in 2003, enabling NMFS to estimate the total incidental captures of sea turtles during 2003. Sampling again increased to 173 trips and 8,100 tows in 2004, almost an eight-fold increase from the sampling level during 1992 to 2002.

Section 5.1.2 of this document assesses the impacts of the alternatives under consideration on non-target species. In general, all the measures included in the proposed action have positive or neutral cumulative impacts on non-target species.

4.3 Threatened, Endangered and Other Protected Species

A complete list of threatened, endangered and other protected species inhabiting the scallop management unit was provided in Amendment 10 to the Sea Scallop FMP and is attached to this document as Attachment B (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>. 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.

According to the most recent Biological Opinion provided by NOAA Fisheries and dated 12/15/04, the scallop management program as currently implemented may adversely affect loggerhead and leatherback sea turtles. Loggerheads were previously considered the only hard-shelled turtle species that has been identified as captured in the scallop dredge fishery despite increased observer coverage throughout the fishery and improved observer training to identify and document sea turtle interactions with the fishery.

On November 1, 2005, however, the agency reinitiated Section 7 consultation under the Endangered Species Act based on new information regarding takes of sea turtles in the trawl component of the scallop fishery, new information regarding the species observed captured in scallop fishing gear and the location the observed takes. The factors discussed are now incorporated into considerations of protected species in Framework 18.

A turtle observed captured in scallop dredge gear operating on Georges Bank in August 2005 was identified as a Kemp's ridley from photographs taken by an NMFS-authorized observer. The event constitutes new information about the area in which interactions between sea turtles and scallop fishing gear occurs and the species involved in such interactions.

Moreover, a review of past observer records also revealed new information on the fishery in relation to its effects on ESA-listed sea turtles. Following a review of information associated with a turtle observed taken in scallop dredge gear in 1997, it was determined that the turtle was a green sea turtle as originally identified by the observer and as recorded in the observer database. Previous agency Biological Opinions for the Atlantic sea scallop fishery, including the December 15, 2004, Opinion had identified this turtle as an "unidentified hard-shelled species" dating back to the December 28, 2000 ESA section 7 consultation for Framework Adjustment 14 to the Atlantic Sea Scallop FMP.

And finally, a total of five loggerhead sea turtles have been observed captured in trawl gear used in the Atlantic sea scallop fishery during the 2005 fishing year to date. Therefore, the number of loggerhead sea turtles observed taken thus far in the 2005 scallop trawl fishery represents new information on the effects of the fishery on ESA-listed sea turtles. Previously, interactions were not attributed to the sector of the fishery.

The agency retains the finding that hawksbill sea turtles are not likely to be affected by the sea scallop fishery or associated management actions. The agency also previously determined and maintains that the scallop management program is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, North Atlantic right whales, humpback whales, fin whales, sei whales, blue whales, or sperm whales, all of which are listed as endangered species under the ESA.

A number of cetacean and pinniped species inhabit the action area and are not listed under the ESA, but are afforded protection by the Marine Mammal Protection Act. Several are vulnerable to scallop dredge gear. Although documented reports of such interactions have been non-existent for numbers of years, recent information obtained through the NMFS observer program has documented a harbor porpoise, and unidentified dolphin and an unknown species of seal taken in scallop dredge gear. Species of marine mammals likely to be found in the scallop management unit are listed in Amendment 10 to the 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>. No evidence to date indicates the current scallop management program adversely affects right whale critical habitat.

4.3.1 Sea Turtle Interactions

The following protected species sections, including tables and maps, were taken from or summarized from Murray 2004, Murray 2004a, and Murray 2005 and are included to inform the discussion in Section 5.0, Environmental Consequences. Observations of the fishery to date have documented sea turtle interactions with the scallop dredge fishery in the Mid-Atlantic during the months of June through October and potentially in May and November.

History of Observer Coverage from 2001-2004

Since a dedicated observer program began monitoring fishing effort in the Atlantic sea scallop dredge fishery in 2001, turtle interactions with dredge gear have occurred throughout various areas of the Mid-Atlantic Bight. During 2001-2002, observer coverage (% observed dredge hours/VTR dredge hours) was focused almost entirely in the Hudson Canyon and Virginia Beach Access Areas (Table 31). During these two years, observers sampled approximately 11% of the commercial dredge effort in the Hudson Canyon Access Area from May to December. Less than 16% of the effort was observed in the Virginia Beach Access Area during 2001. No trips were observed in the Virginia Beach Access Area during 2002 due to low commercial fishing effort in the area. Outside of these two areas, observer coverage was less than 1%.

The spatial extent of observer coverage in the commercial scallop dredge fishery expanded in 2003 and 2004. This increase in spatial coverage was needed to properly assess bycatch outside of the access areas. During 2003, observers sampled approximately 10% of the dredge effort in the Hudson Canyon Access Area from June to November, and approximately 1.5% in open areas of the Mid-Atlantic outside of the Hudson Canyon between Montauk, NY and Cape Hatteras, NC. During June-November 2004, observer coverage in the Hudson Canyon Access Area was 6%, and 4% in open areas of the Mid-Atlantic.

Prior to the availability of the most recent information it has been assumed that there were few turtle interactions in the scallop fishery in the Georges Bank and Gulf of Maine regions during 2001-2004 (Murray 2005). This is largely because the scallop fisheries there operate north of the general range of loggerhead turtles (~41°N as a northern limit; Shoop and Kenney 1992). Moreover, there were no observed takes in the sea scallop dredge fishery operating on Georges Bank during 2001-2004, although observer coverage in the region was limited. Observer coverage increased during 2004, but most of the

coverage occurred in November after Closed Area II and Nantucket Lightship Access Areas opened and when interactions would not be likely based on sea turtle temperature preferences (Epperly et al. 1995b; Shoop and Kenney, 1992).

From 2001-2003 there was insufficient observer coverage in the scallop trawl fishery to support a scientifically defensible estimate of sea turtle bycatch in this fishery (Murray 2004a). A potential for turtle bycatch exists, however, as evidenced by the information discussed earlier and obtained from observations of scallop trawl trips in 2004 and 2005, as well as the spatial and temporal overlap of scallop trawl fishing effort overlaps and sea turtle distribution.

Table 31. Seasonal Observer Coverage in the Atlantic Sea Scallop Dredge Fishery 2001-2004*

Region	2001	2002	2003	2004
Hudson Canyon	10.6%	11.4%	9.7%	6.0%
Virginia Beach	15.6%	0%	0%	0%
Mid-Atlantic Open Areas	<1%	<1%	1.4%	4.0%
Georges Bank	<1%	<1%	<1%	<2%

*Coverage in 2001-2002 was calculated from May to December, and in 2003-2004 from June to November

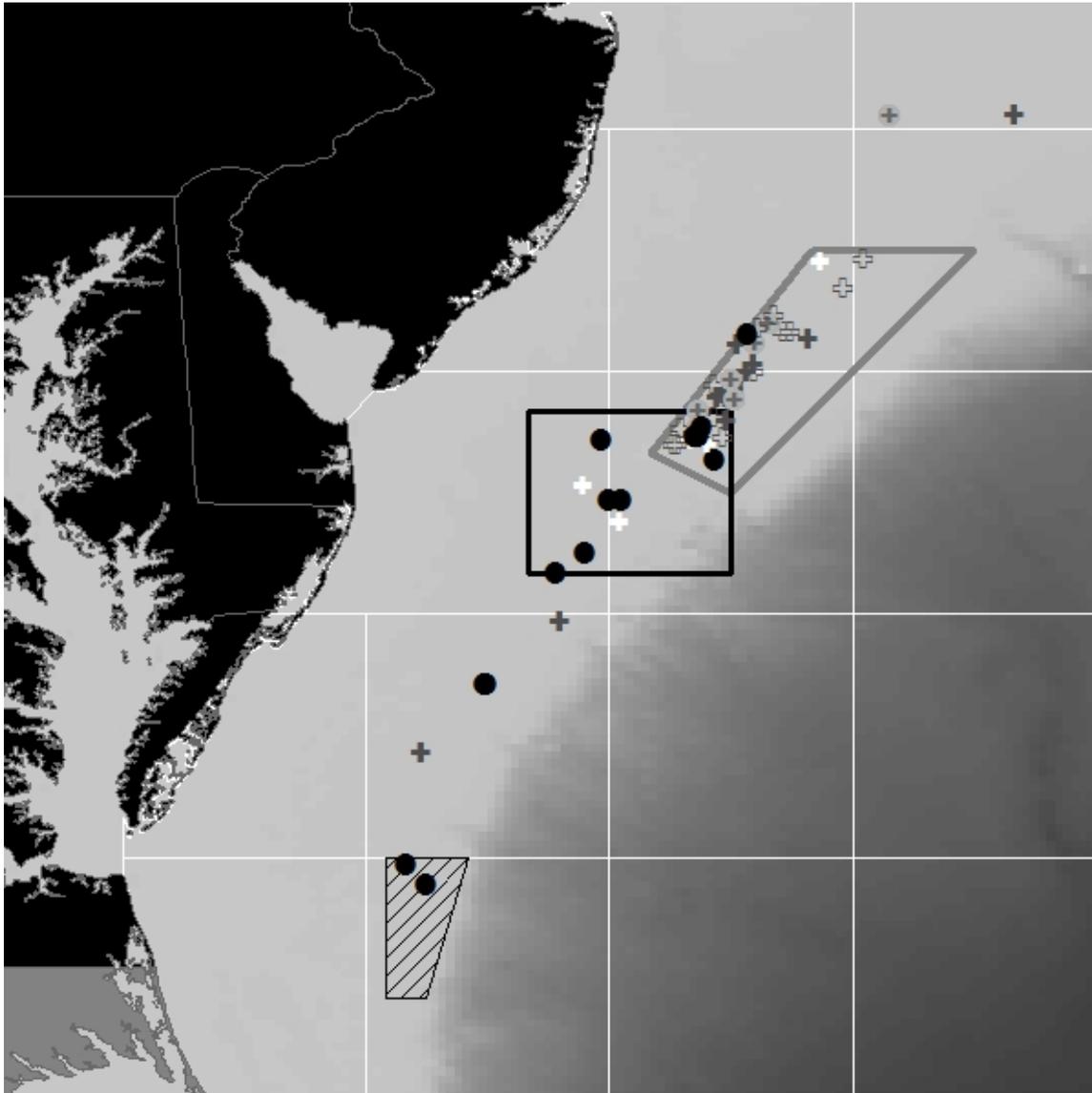
Observed Turtle Interactions from 2001-2004

From 2001-2004, turtle interactions in the sea scallop dredge fishery were observed to occur from June to October, with the maximum number of observed takes per month varying from year to year (Table 32). Most of the observed interactions occurred between 37°N to 40°N latitudes, in depths between 50-70 m (Map 7) in the Hudson Canyon Access Area, the Virginia Beach Access Area, the Elephant Trunk Access Area, and open areas of the Mid-Atlantic (Table 3). It is important to note that greatest percentage of the observed trips were taken in the Hudson Canyon Area, potentially biasing information on the latitude and depth in which interactions occur. Since 2001, only loggerhead turtles (*Caretta caretta*) have been positively identified in the scallop dredge fishery in the Mid-Atlantic.

Table 32. Observed Turtle Interactions by Month and Year in the Atlantic Sea Scallop Dredge Fishery 2001-2004

	2001*	2002*	2003	2004	Total
June	3	0	0	2	5
July	4	8	4	0	16
August	1	3	6	3	13
September	0	6	2	1	9
October	3	0	10	2	15
Total	11	17	22	8	58

Map 7 **Turtle Bycatch in the Atlantic Sea Scallop Dredge Fishery 2001-2004 (Observer Database).**



Map Legend:

Month classification (June=white solid cross, July=gray outlined cross, August=gray solid cross, September=dark gray cross in light gray circle, October=black circle).

Areas (Hudson Canyon Area is polygon in the North, Elephant Trunk area is the rectangle in the middle, and Virginia Beach area is the polygon in the south).

Table 33. Observed Turtle Interactions by Month, Year, and Mid-Atlantic Region in the Atlantic Sea Scallop Dredge Fishery 2001-2004

Year	Region	Month				
		Jun	Jul	Aug	Sep	Oct
2001	Open+	NA				
	HCAA	3	4	1	0	1
	ETA	NA				
	VB	0	0	0	0	2
2002	Open	NA				
	HCAA	0	8	3	6	0
	ETA	NA				
	VB	NA				
2003	Open	0	0	0	0	0
	HCAA	0	4	5	2	5*
	ETA	0	0	1	0	5
	VB	NA				
2004	Open	0	0	2	1	2
	HCAA	0	0	1	0	0
	ETA	2	0	0	0	0
	VB	NA				

NA= Insufficient observer coverage existed in that block

+ = Mid Atlantic excluding HCAA, ETA, and VB

* 4 of the 5 takes in the HCAA occurred in the area overlapping the ETA

Total Estimated Bycatch of Turtles from 2001-2004

During 2001-2002, total estimated bycatch of sea turtles in the Hudson Canyon and Virginia Beach Access Areas was 169 animals (CV =55.3), of which 164 (97%) animals were in the Hudson Canyon area (Murray 2004). Estimation of bycatch for all of the Mid-Atlantic Bight was possible after observer coverage expanded outside of the Access Areas in 2003-2004. The 2003 estimate was 749 animals (CV =0.28) (Murray 2004a), of which 122 (16%) were in the Hudson Canyon Access Area. In 2004, total estimated bycatch of turtles was 180 animals (CV =0.37), of which 17 (9%) were in the Hudson Canyon Access Area (Murray 2005).

Summary of 2004 Turtle Interactions in the Scallop Dredge Fishery

During 2004, factors influencing the bycatch rates of loggerhead turtles were depth zone, and geographic area. Areas of highest predicted bycatch rates were located to the north and south of the Hudson Canyon Access Area in water depths of 54-70m (Map 8). During 2003, almost all of the turtle interactions in the Elephant Trunk Area occurred during October (Table 33).

The total estimated bycatch of loggerhead sea turtles from 1 June to 30 November 2004 in the Mid-Atlantic sea scallop dredge fishery was 180 animals (CV=0.37, 95% CI=65-319). Of these 180 takes, 17 occurred in the Hudson Canyon Access Area (HCAA) and 163 occurred outside this area.

Eight turtle interactions were observed in the Mid-Atlantic sea scallop dredge fishery during 2004. Two of the 8 takes occurred in June (25%), 3 in August (38%), 1 in September (12%), and 2 in October (25%). Two of the 8 (25%) turtles were released alive and uninjured, 5 were injured (63%), and 1 (12%) was fresh dead. Only 1 of the eight takes (12%) occurred in the HCAA.

It was previously assumed that there are no turtle interactions in the sea scallop fishery in the Georges Bank and Gulf of Maine regions in 2004, because fisheries there operate north of the general range of loggerhead turtles, and no observed takes occurred during 2002-2004 in these regions. Updated information discussed earlier indicates that a turtle taken on Georges Bank in 1997 was a green and that a Kemp's ridley was taken in 2005 on Georges Bank in scallop dredge gear.

A total of 172 trips were observed during June-November 2004 in the Mid-Atlantic scallop dredge fishery, of which 16 trips were aboard vessels whose dredges were equipped with turtle chain mats (and in which no turtle takes occurred). From June-November 2004, observers sampled 5% (% observed dredge hours/VTR dredge hours) of the commercial sea scallop dredge fishing effort in the Mid-Atlantic. Observer coverage in the HCAA was 6%, and 4% outside the area.

Factors related to the bycatch rates of turtles in 2004 were depth zone, and whether trips occurred inside or outside of the HCAA. Highest bycatch rates occurred outside of the HCAA, in depths between 54 and 70m.

By contrast, during 2003, an estimated 749 loggerhead turtle interactions occurred. Of these 749 takes, 122 occurred in the HCAA and 627 occurred outside this area. Again the caveat applies that most of the observed trips occurred in the Hudson Canyon Area

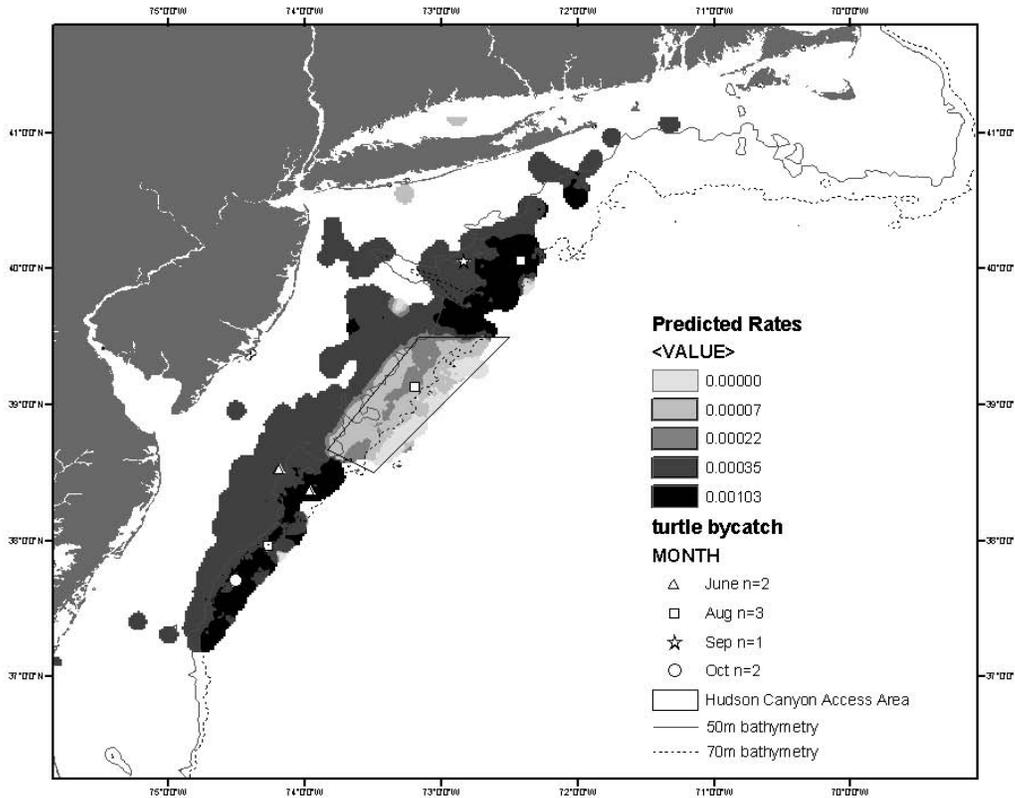
Several changes occurred in the sea scallop dredge fishery during 2004, which may have impacted the probability of encountering a turtle in scallop dredge gear. These include voluntary use by some fishermen of the chain mat gear, as well as rotational and gear restrictions which shifted the distribution of fishing effort.

Only 1 turtle take was observed in the HCAA during 2004 compared to 16 takes in 2003, despite an 18% increase in 2004 in observer effort (dredge hours observed) in the HCAA. Outside the HCAA, 7 turtle takes were observed in 2004 compared to 6 takes in 2003, but observer effort in 2004 was 2.3X greater than in 2003. Reductions in the HCAA bycatch rate may have been due to scallop dredge fishing effort shifting into deeper waters (≥ 70 m) in 2004, as well as changes in sea surface temperature in this region during the season of turtle bycatch.

Estimated sea turtle takes were lower in 2004 than in 2003 (180 vs. 749). Compared to 2003, estimated takes in 2004 were lower both inside the HCAA (17 in 2004 vs. 122 in 2003) and outside of the HCAA (163 in 2004 vs. 627 in 2003).

During 2004, sixteen trips were observed on vessels equipped with chain mats. None of these trips caught turtles. In the 2004 bycatch assessment, there was no difference in the bycatch rate between vessels that used a chain mat and those that did not; however, there may have been too few trips observed to detect any significant effects of the chain mat (Murray 2005). Industry trials revealed that the chain mat could successfully exclude turtles from entering the dredge bag (DuPaul and Smolowitz 2004). Use of turtle chain mats is currently proposed to be mandatory for sea scallop dredge vessels operating in the Mid-Atlantic from May through November. This measure may help reduce the bycatch of turtles in the future (Proposed Rule, FR 70: 30660-30666, 27 May 2005.)

Map 8 Predicted bycatch rates of turtles in the Mid-Atlantic sea scallop dredge fishery, June to November 2004 (Murray 2005).



4.4 Physical Environment and Essential Fish Habitat

EFH descriptions and maps for Northeast region species can be accessed at <http://www.nero.nmfs.gov/ro/doc/hcd/>. The following description and map of EFH for Atlantic sea scallops (*Placopecten magellanicus*) is excerpted from the Omnibus EFH Amendment. Essential fish habitat for Atlantic sea scallops is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Map 32 in Amendment 10 to the Atlantic sea scallop FMP and meet the following conditions:

Eggs: Bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to the Virginia -North Carolina border as depicted in Map 32. Eggs are heavier than seawater and remain on the seafloor until they develop into the first free-swimming larval stage. Generally, sea scallop eggs are thought to occur where water temperatures are below 17°C. Spawning occurs from May through October, with peaks in May and June in the middle Atlantic area and in September and October on Georges Bank and in the Gulf of Maine.

Larvae: Pelagic waters and bottom habitats with a substrate of gravelly sand, shell fragments, and pebbles, or on various red algae, hydroids, amphipod tubes and bryozoans in the Gulf of Maine, Georges

Bank, southern New England and the middle Atlantic south to the Virginia -North Carolina border as depicted in Map 32. Generally, the following conditions exist where sea scallop larvae are found: sea surface temperatures below 18°_C and salinities between 16.9‰ and 30‰.

Juveniles: Bottom habitats with a substrate of cobble, shells and silt in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to the Virginia -North Carolina border that support the highest densities of sea scallops as depicted in Map 32. Generally, the following conditions exist where most sea scallop juveniles are found: water temperatures below 15°_C, and water depths from 18 - 110 meters.

Adults: Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to the Virginia –North Carolina border that support the highest densities of sea scallops as depicted in Map 32. Generally, the following conditions exist where most sea scallop adults are found: water temperatures below 21°_C, water depths from 18 - 110 meters, and salinities above 16.5‰.

Spawning Adults: Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to the Virginia - North Carolina border that support the highest densities of sea scallops as depicted in Map 32. Generally, the following conditions exist where spawning sea scallop adults are found: water temperatures below 16°_C, depths from 18 - 110 meters, and salinities above 16.5‰. Spawning occurs from May through October, with peaks in May and June in the middle Atlantic area and in September and October on Georges Bank and in the Gulf of Maine.

Section 7.2.5 of the FSEIS to Amendment 10 described benthic habitats that exist within the range of the scallop fishery biological characteristics of regional systems, and assemblages of fish and benthic organisms. It also included a description of canyon habitats on the edge of the continental shelf. No new information is available.

Section 7.2.6 of the FSEIS to Amendment 10 evaluated the potential adverse effects of gears used in the scallop fishery on EFH for scallop and other federally-managed species and the effects of fishing activities regulated under other federal FMPs on scallop EFH. The evaluation considered the effects of each activity on each type of habitat found within EFH. The two gears used in the directed scallop fishery are bottom trawls and scallop dredges. Scallop EFH has been determined to only be minimally vulnerable to bottom-tending mobile gear (bottom trawls and dredges) and bottom gillnets. Therefore, the effects of the scallop fishery and other fisheries on scallop EFH do not require any management action. However, the scallop dredge and trawl fisheries do have more than a minimal and temporary impact on EFH for a number of other demersal species in the region.

The following conclusions were reached in Amendment 10 to the Atlantic sea scallop FMP:

- Potentially adverse habitat impacts from bottom trawling occur throughout most of the NE region on a variety of substrates;
- High levels of fishing activity with scallop dredges occur primarily in the Mid-Atlantic region and secondarily on Georges Bank, according to the vessel trip report data from 1995 – 2001. Intense dredge activity from the same data show that the highest intensity of scallop fishing is in the Great South Channel and portions of the Mid-Atlantic region from Long Island to VA. The VMS data from 1998 confirms this assessment and also shows high scallop fishing intensity in the southern part of Closed Area II because the period included the area access

program during the 1999 and 2000 fishing years which was intended to have high levels of effort to reduce impacts in open areas where smaller scallops existed.

- Potentially adverse habitat impacts from scallop dredging may occur in areas where scallop effort overlaps with areas where EFH has been designated for species with vulnerable EFH. According to the analysis within this document, scallop fishing effort is distributed in the same proportion as juvenile and adult EFH designations, but areas with more intense scallop fishing effort tend to be over areas with less EFH designations for species with vulnerable EFH.

Adverse impacts that were more than minimal and less than temporary in nature were identified for the following species and life stages, based on an evaluation of species life history and habitat requirements and the spatial distributions and impacts of bottom otter trawls in the region (Stevenson *et al.*, in press):

Otter Trawls

The use of Otter Trawls may have an adverse effect on the following species (and life stages) EFH as designated in Amendment 11 to the Northeast Multispecies FMP (1998):

American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), ocean pout (E, L, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), red crab (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

Scallop Dredge (New Bedford style)

The use of New Bedford style Scallop Dredges may have an adverse effect on the following species (and life stages) EFH as designated in Amendment 11 to the Northeast Multispecies FMP (1998):

American plaice (J, A), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), ocean pout (E, L, J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (J, A), yellowtail flounder (J, A), black sea bass, (J, A), scup (J), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).*

Gear types other than otter trawls and scallop dredges, in the context of the Atlantic Sea Scallop fishery, were not found to have adverse effects the Essential Fish Habitat as currently designated in this region. See Table 34 for a description of the species and life staged that were determined to be adversely impacted in a manner that is more than minimal and less than temporary in nature in Amendment 10.

Table 34. Summary species and life stage's EFH adversely impacted by otter trawling and scallop dredging (gears that adversely impact EFH used in the Scallop fishery).

Species	Life Stage	Vulnerability to Otter Trawling	Vulnerability to Scallop Dredging	Depth in meters (EFH Designation)	Substrate (EFH Designation)
American Plaice	A	High	High	45-150	sand or gravel
American Plaice	J	Mod	Mod	45-175	sand or gravel
Atlantic Cod	A	Mod	Mod	25-75	cobble or gravel
Atlantic Cod	J	High	High	10-150	rocks, pebble, gravel
Atlantic Halibut	A	Mod	Mod	20-60	sand, gravel, clay
Atlantic Halibut	J	Mod	Mod	100-700	sand, gravel, clay
Barndoor Skate	A	Mod	Mod	0-750, mostly <150	mud, gravel, and sand
Barndoor Skate	J	Mod	Mod	0-750, mostly <150	mud, gravel, and sand
Black Sea Bass	A	High	High	20-50	structures, sand and shell
Black Sea Bass	J	High	High	1-38	rough bottom, shell and eelgrass beds, structures and offshore clam beds in winter
Clearnose Skate	A	Mod	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Clearnose Skate	J	Mod	Mod	0-500, mostly <111	soft bottom along shelf and rocky or gravelly bottom
Haddock	A	High	High	35-100	pebble gravel
Haddock	J	High	High	40-150	broken ground, pebbles, smooth hard sand, smooth areas between rocky patches
Little Skate	A	Mod	Mod	0-137, mostly 73-91	sand or gravel or mud
Little Skate	J	Mod	Mod	0-137, mostly 73-91	sand or gravel or mud
Ocean Pout	A	High	High	<110	soft sediments
Ocean Pout	J	High	High	<80	smooth bottom near rocks or algae
Ocean Pout	L	High	High	<50	close to hard bottom nesting areas
Ocean Pout	E	High	High	<50	hard bottom, sheltered holes
Pollock	A	Mod	Mod	15-365	hard bottom, artificial reefs
Red Hake	A	Mod	Mod	10-130	sand and mud
Red Hake	J	High	High	<100	shell and live scallops
Redfish	A	Mod	Mod	50-350	silt, mud, or hard bottom
Redfish	J	High	High	25-400	silt, mud, or hard bottom
Rosette Skate	A	Mod	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Rosette Skate	J	Mod	Mod	33-530, mostly 74-274	soft substrates including sand/mud and mud
Scup	J	Mod	Mod	0-38	inshore sand, mud, mussel and eelgrass beds
Silver Hake	J	Mod	Mod	20-270	all substrate types
Smooth Skate	A	High	High	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles
Smooth Skate	J	Mod	Mod	31-874, mostly 110-457	soft mud, sand, broken shells, gravel and pebbles
Thorny Skate	A	Mod	Mod	18-2000, mostly 111-366	sand gravel, broken shell, pebble, and soft mud
Thorny Skate	J	Mod	Mod	18-2000, mostly	sand gravel, broken shell, pebble,

Species	Life Stage	Vulnerability to Otter Trawling	Vulnerability to Scallop Dredging	Depth in meters (EFH Designation)	Substrate (EFH Designation)
				111-366	and soft mud
Tilefish	A	High	Low	76-365	rough, sheltered bottom
Tilefish	J	High	Low	76-365	rough, sheltered bottom
White Hake	J	Mod	Mod	5-225	pelagic during pelagic stage and mud or fine sand during demersal stage
Winter Flounder	A	Mod	Mod	1-100	estuaries with mud, gravel, or sand
Winter Skate	A	Mod	Mod	0-371, mostly <111	sand, gravel, or mud
Winter Skate	J	Mod	Mod	0-371, mostly <111	sand, gravel, or mud
Witch Flounder	A	Mod	Low	25-300	fine-grained sediment
Witch Flounder	J	Mod	Low	50-450	fine-grained sediment
Yellowtail Flounder	A	Mod	Mod	20-50	sand and mud
Yellowtail Flounder	J	Mod	Mod	20-50	sand and mud

In Amendment 13 to the Northeast Multispecies FMP and Framework 16 to the Scallop FMP, the New England Council implemented a range of measures to minimize the impacts of bottom trawling in the Gulf of Maine, George’s Bank and Southern New England. In addition to the significant reductions in days-at-sea and some gear modifications, the Council closed 2,811 square nautical miles to bottom-tending mobile fishing gear (known as Habitat Closed Areas). Although on August 2, 2005 the portions of Framework 16 that modify the habitat closures established by Amendment 10 were vacated by a court order; therefore, measures to minimize adverse effects of gear used in the scallop fishery that adversely affect EFH above the threshold allowed by law remain in effect due to the regulations promulgated as a result of Amendment 13 to the Northeast Multispecies FMP. It should be noted that the Amendment 13 and the Framework 16 habitat closure boundaries are exactly the same and are both Level 3 closures.

Because the monkfish fishery overlaps significantly with the groundfish fishery in the northern fishery management area and the habitat closed areas extend into the southern fishery management area, measures to protect habitat in Amendment 10 and Amendment 13 assist in minimizing the effect of fishing on EFH in the monkfish fishery.

4.5 Fishery Businesses and Communities

The sea scallop fishery has been previously described in various documents (SPDT 2000, NEFMC 2003, NMFS 2004c), and the following provides an updated description of the fishery. The historical trends in fishing activity (DAS), landings, revenues, prices and foreign trade in the sea scallop fishery is further discussed in SAFE 2005 report provided in the Appendix I.

4.5.1 Participation and permits in sea scallop fishery

The scallop fishery consists of vessels with limited access scallop permits that are regulated with area-specific DAS and trip allocations and vessels with general category scallop permits that are regulated with a 400 lb. possession limit. The limited access fishery was established since Amendment 4 to the Scallop FMP was developed and implemented in 1994 (NEFMC 2003). The limited access vessels consist of full-time, part-time and occasional vessels with subcategories within each permit group. Depending on the type of limited access permit for which the vessel qualified, a scallop limited access vessel may have the option of fishing with any gear type (permit categories 2, 3 and 4), with a small dredge (categories 5 and 6), or with trawl nets (categories 7, 8 and 9). Fishing effort for vessels that

possess limited access permits is managed through the use of crew size restrictions, gear restrictions, and DAS allocations. In terms of the latter, DAS allocations vary by which limited access permit is possessed by the vessel (Table 36).

Days-at-Sea and trip allocations for special access areas are similarly varied by permit category. Owners of limited access vessels assigned to either the part-time or occasional categories (permit categories 3 and 4, respectively) may opt to be placed one category higher (permit categories 5 and 6, respectively), provided they agree to comply with the small dredge program restrictions. Vessels in the small dredge program must: (1) fish exclusively with one dredge no more than 10.5 ft in width; (2) the vessel may not have more than one dredge on board or in use; and (3) the vessel may have no more than five people, including the operator, on board (NEFMC 2003).

The number of limited access vessels increased from 280 in 1999 to 337 in 2004 (Table 35). According to the permit data, about 300 vessels with full-time, 30 with part-time and 7 with occasional permits participated in the sea scallop fishery during 2004. Despite the effort controls and reduction in DAS allocations, total DAS used in the fishery also increased during the same period due to the increase in the number of participants in the fishery (Table 36). During the recent year, the Confirmation of Permit Histories (essentially limited access permits in reserve) was placed on new or newly outfitted vessels. Another important trend was that vessels with part-time and occasional permits were converted into full-time or part-time small dredge permits as the resource conditions improved and the daily catches for a vessel with a small dredge permit became closer to the daily catches of a vessel with a large dredge permit. The number of qualifiers for the scallop limited access fishery has declined, however, from around 450 in 1994 to approximately 380 for the 2003 scallop fishing year (P. Christopher, NMFS, pers.comm.).

Table 35. Scallop Permits by application year.

Permit Category	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005*
Full-time	227	227	214	203	202	207	219	223	229	236	239	
Full-time small dredge	5	4	5	3	2	1	3	13	25	37	47	
Full-time trawl	30	32	27	23	23	16	17	16	16	16	14	
Total full-time	262	263	246	229	227	224	239	252	270	289	300	305
Part-time	26	21	18	16	11	11	15	14	13	10	4	
Part-time small dredge	8	6	8	8	6	3	4	6	8	17	23	
Part-time trawl	30	28	27	30	26	18	20	18	10	7	3	
Total part-time	64	55	53	54	43	32	39	38	31	34	30	27
Occasional	4	3	2	2	3	4	4	5	4	2	2	
Occasional trawl	28	26	25	20	19	20	16	15	15	8	5	
Total occasional	32	29	27	22	22	24	20	20	19	10	7	3
Total limited access	358	347	326	305	292	280	298	310	320	333	337	326
General Category	1,960	2,067	1,984	1,993	1,930	2,074	2,247	2,293	2,493	2,554	2,801	

* Preliminary numbers by the end of June 2005

Table 36. DAS allocations and fishing effort

Fishing year	DAS Allocated				DAS-used	Number of Permits using DAS
	Full-time	Part-time	Occasional	Total		
1994	204	82	17	59,214	35,378	229
1995	182	73	15	52,310	33,869	238
1996	182	73	15	49,040	34,899	246
1997	164	66	14	41,399	30,832	227
1998	142	57	12	34,937	27,053	232
1999	142	57	12	33,910	23,087	244
2000	120	48	10	30,752	24,465	263
2001	120	48	10	32,264	28,193	282
2002	120	48	10	34,078	30,061	292
2003	120	48	10	36,412	31,597	308
2004	126	50	11	39,386	29,303	325
2005	100	40	8	31,605		

Although the scallop fishery is a limited access fishery, alternative measures are in place to allow vessels that did not qualify for a limited access permit to possess and land scallops as well. These are: (1) through possession of a general category permit or (2) in accordance with the exemption for vessels that have neither a limited access nor general category permit. Scallop possession and landing limits vary depending on which of these apply to the vessel. For example, vessels that have neither a limited access nor general category permit (except those that participate exclusively in the state waters) are allowed to possess and land up to 40 pounds of scallop meat or 5 bushels of shell stock per trip. Vessels that possess a general category permit for the fishery are allowed to retain or land up to 400 pounds of shucked scallops, or 50 U.S. bushels of in-shell scallops per trip. The possession limit is the primary effort control mechanism for the general category vessels. General category permit holders may fish with all gear types, including gillnet, pot/trap, and clam/quahog dredges. However, scallop dredge gear and bottom trawl gear are the most common (NEFMC 2003).

The number of vessels with general category permits has been rising since the late 1990's, increasing from 1,930 in 1998 to 2,801 in 2004 (Table 35). There has been also an increase in general category landings during the recent years from 1.8 million lb. in 2003 to 3.6 million lb. in 2004, most of which was due to the landings by vessels with general category permits (Table 45). This has been the result of increase in scallop abundance combined with an increase in the price of scallops especially during 2005, which made general category scallop fishing quite profitable for some vessels. Extensive information about the characteristics and activity of the general category vessels in 2003 were provided in Framework 17 to the Sea Scallop FMP. Section 4.5.4 reviews the recent trends in the general category scallop fishery with an emphasis on activity in 2004, and Appendix I provides more detailed information.

4.5.2 Trends in landings, revenues and prices in the sea scallop fishery

The scallop fishery is one of the most valuable U.S. fisheries (NMFS 2003a). U.S. landings exceeded 54.6 million pounds in 2003 fishing year and 62.1 million pounds in 2004, a new record. The 2004 U.S. ex-vessel sea scallop revenues were about \$307 million making the sea scallop fishery the second most valuable in the northeastern United States (NMFS 2004c). The historical trends in sea scallop landings, revenues, prices are shown in Table 37 for the period 1994-2005. The period from 1994-

1998 corresponds to the implementation of Amendment 4, when the Council began managing the scallop fishery through limited access controls. As Table 1 shows, overfishing in the previous period combined with the effort reduction measures and closure of the Georges Bank groundfish areas to scallop fishing resulted in a dramatic decline in scallop landings, averaging only 15.5 million lb. per year during this period. The period from 1999 to 2004 corresponds, however, to the rebuilding of the sea scallop biomass. As a result of this recovery, landings almost doubled to 21.1 million in 1999 from 11.2 million lb. in 1998, and have increased over 50 million lb. since 2002. During the same period, landings per unit effort, i.e. per day-at-sea used, more than doubled compared to the levels during 1994-1998, lowering the fishing costs per pound of scallops and benefiting the vessels participating in the sea scallop fishery.

Table 37. Total scallop landings and revenues by limited access and by vessels with general category permits.

Fishing year	Total landings (million lbs.)	Total Revenue (million \$) (in 2004 prices)	Average price per pound (in 2004 prices)	Average landings per DAS-used
1994	15.3	74.3	\$ 4.85	428
1995	15.8	80.2	\$ 5.08	463
1996	16.4	92.8	\$ 5.65	465
1997	12.8	82.8	\$ 6.49	402
1998	11.2	67.7	\$ 6.05	406
1999	21.1	115.1	\$ 5.47	904
2000	33.2	163.2	\$ 4.92	1,329
2001	45.5	166.2	\$ 3.65	1,557
2002	49.9	193.5	\$ 3.88	1,623
2003	54.6	225.0	\$ 4.12	1,668
2004	62.1	307.0	\$ 4.94	2,013
2005*	43.2	313.0	\$ 7.25	

*All figures for 2005 are preliminary. Landings and revenues for 2005 include 9 months from March to October 2005. For other items, 2005 data includes end of June.

The increase in landings and strong competition from scallop imports led to in a decline in scallop ex-vessel prices during 1999-2002, from \$5.47 per lb. in 1994 to \$3.65 per lb. in 2001 (in inflation adjusted 2004 prices). Even at these lower prices, annual scallop revenue per year after 1998 significantly exceeded the average revenue during 1994-1998 due to the increase in landings. Both landings and the ex-vessel price of scallops increased after 2001, however, resulting in a record increase in scallop revenues, to over \$200 million in 2003 and over \$300 million since 2004. Since the start of fishing year 2005, scallop prices continued to increase, rising to over \$9.00 per pound since the summer of 2005, and averaging \$7.25 per pound for the first 8 months of the fishing year from March to the end of October 2005. This increase was driven by the changes in world demand and supply of scallops, increase in US exports, decrease in the imports from major competitors of US such as Canada and Japan. Another factor was the change in the composition of landings towards larger scallops that command a higher price. For a more comprehensive description and analysis of the economic trends in sea scallop fishery including foreign trade, see Appendix I.

4.5.3 Limited access scallop fishery

The number of limited access vessels and trends in landings and revenue per vessel and vessel characteristics are summarized in Table 38 by broad permit categories and in Table 40 for full-time vessels disaggregated by gear category. Higher overall revenues for the scallop fishery translated into

larger scallop revenue per vessel despite the increase in the number of participants throughout the years. Annual scallop revenue averaged \$476,666 per full-time dredge vessel during 1994-1998, but increased by 73 % to \$823,417 per vessel during 1999-2004. Revenue per full-time dredge vessel reached an all-time high of \$1,080,000 in 2004 (Figure 4).¹⁸

Table 38. Trends in landings, Revenue and vessel size by limited access vessels.

Period	Permit Category	Average of Scallop Revenue (1)	Scallop Landings per Vessel	Gross Tonnage	Number of vessels	Horsepower
1982-1988	Full-time	795,662	98,667	160	NA	801
	Part-time	54,276	7,166	117	NA	495
	Occasional	25,890	3,777	104	NA	456
1982-1988 Total		758,860	94,126	157	NA	785
1989-1993	Full-time	706,716	115,212	158	NA	827
	Part-time	82,470	14,268	114	NA	451
	Occasional	14,144	2,434	82	NA	393
1989-1993 Total		664,995	108,457	155	NA	801
1994-1998	Full-time	446,668	66,019	158	245	820
	Part-time	105,596	16,377	130	54	501
	Occasional	3,857	517	73	26	378
1994-1998 Total		424,670	62,798	155	321	325
1999-2004	Full-time	759,816	165,152	152	262	789
	Part-time	208,002	48,136	118	34	485
	Occasional	7,193	1,680	90	17	420
1999-2004 Total		720,205	156,707	150	315	313

(1) Adjusted for inflation and expressed in terms of 2004 prices

¹⁸ Although these figures are consistent with the overall trends, they should be interpreted with caution because they are obtained from dealer's data, which may not be totally consistent throughout the years 1982 to 2004. A new data collection system was implemented in 1994 and then again in 2004. In addition, there were no limited access permit categories prior to 1994, and the data for 1982 to 1993 was derived by tracing the activity of the vessels that had a limited access permit in 2004 to the previous years. In addition, not all vessels that had a permit in 2004 were active or caught scallops in the earlier years.

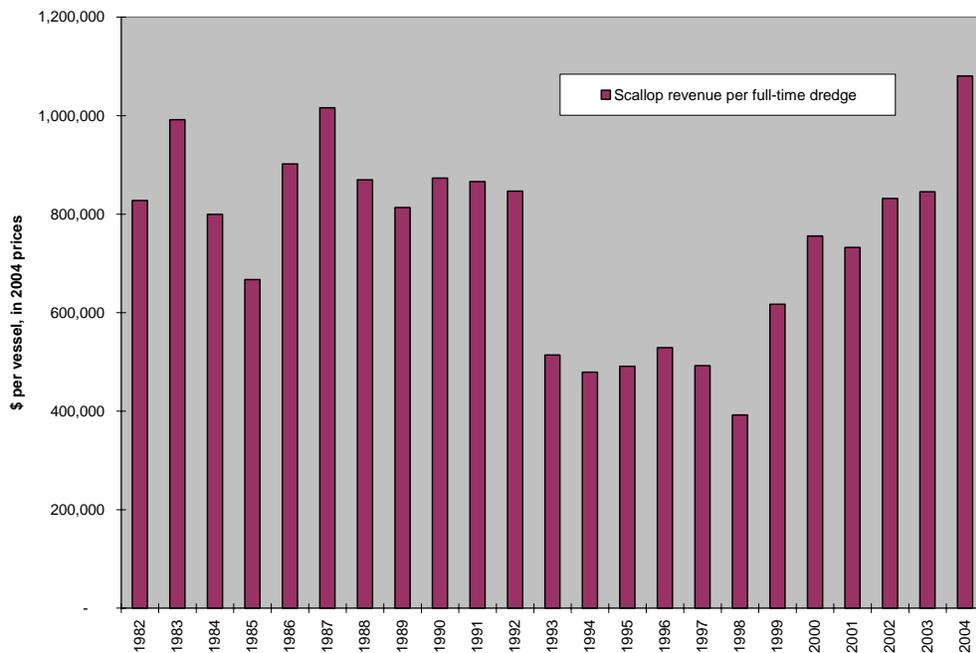


Figure 4. Scallop revenue per full-time dredge vessel (in 2004 inflation adjusted prices)

Overwhelmingly, dredge gear is the primary gear type used in the scallop fishery (Table 39). Ninety-five percent of the scallop landings for the 2003 scallop fishing year were attributed to scallop dredge gear. It is interesting to note, however, that while landings by trawl gear (~ 5% of the total) were much lower than landings by dredge gear, the Delmarva resource area accounted for 90% of the trawl landings (NMFS Preliminary Fisheries Statistics). Less than 2% of trawl landings were attributed to non-Mid-Atlantic resource areas (NMFS Preliminary Fisheries Statistics).

Table 39. Landings by limited access vessels by gear type

Fishing year	Gear Type			
	Total	Dredge	Trawl	Other
1994	15.1	90.5%	9.2%	0.3%
1995	15.7	90.2%	9.5%	0.3%
1996	16.2	91.0%	8.7%	0.3%
1997	12.4	92.9%	6.3%	0.8%
1998	11.0	88.0%	11.2%	0.7%
1999	20.9	90.2%	9.5%	0.4%
2000	32.5	91.3%	7.6%	1.1%
2001	43.9	91.0%	6.9%	2.1%
2002	48.8	93.4%	5.4%	1.2%
2003	52.7	95.4%	4.0%	0.6%
2004	59.0	93.8%	5.9%	0.3%
2005*	37.9	99.1%	0.8%	0.1%

*All figures for 2005 are preliminary. Landings and revenues for 2005 include 9 months from March to October 2005. For other items, 2005 data includes end of June.

Table 40. Trends in landings, Revenue and vessel size by full-time vessels.

Period	Permit Category	Average of Scallop Revenue (1)	Scallop Landings per Vessel	Gross Tonnage	Horsepower	Number of Vessels
1982-1988	Full-time	870,756	107,901	164	828	NA
	Full-time small dredge	175,229	22,469	117	584	NA
	Full-time trawl	35,462	4,835	128	494	NA
1982-1988 Total		795,662	98,667	160	NA	801
1989-1993	Full-time	782,779	126,929	165	877	NA
	Full-time small dredge	166,570	29,764	114	527	NA
	Full-time trawl	333,693	62,394	122	461	NA
1989-1993 Total		706,716	115,212	158	NA	827
1994-1998	Full-time	476,666	69,572	165	872	215
	Full-time small dredge	129,688	20,792	108	472	4
	Full-time trawl	387,205	68,337	121	475	27
1994-1998 Total		446,668	66,019	158	246	820
1999-2004	Full-time	823,417	177,506	162	853	226
	Full-time small dredge	379,628	86,471	108	510	21
	Full-time trawl	683,092	161,590	118	470	16
1999-2004 Total		759,816	165,152	152	263	789

(1) Adjusted for inflation and expressed in 2004 prices.

The trends in revenue for part-time and occasional vessels are similar to the trends for full-time vessels although they are less certain due to the recent switches in permit category of these vessels to full-time or part-time small dredge categories as mentioned above.

Table 38 shows that the average annual revenue of a full-time vessel, including trawls and small-dredge vessels, increased by 70% during the 1999-2004 period compared to the average revenue per vessel during the 1994-1998 period. Scallop revenue per part-time and occasional vessel almost doubled during the same periods.

The striking increase in the scallop revenue per full-time vessel according to the gear categories is evident from Table 40. While the vessels in all categories have more than doubled their annual scallop revenue during 1999-2004, annual scallop revenue per full-time small dredge vessel almost tripled, explaining the incentive to transfer part-time permits to full-time small-dredge permit during recent years.

Table 41. Revenue per vessel for full-time vessels by tonnage class.

Period	Permit Category	51-100 GRT	101-150 GRT	> 150 GRT
1982-1988	Full-time	486,878	718,082	945,195
	Full-time small dredge	20,320	238,461	217,925
	Full-time trawl	10,824	36,830	
1982-1988 Total		148,698	607,591	936,121
1989-1993	Full-time	505,528	670,336	835,730
	Full-time small dredge	49,133	224,116	191,689
	Full-time trawl	356,245	289,338	609,979
1989-1993 Total		198,689	563,483	828,903
1994-1998	Full-time	338,541	426,467	500,875
	Full-time small dredge	80,408	169,379	1,283
	Full-time trawl	285,492	410,290	455,876
1994-1998 Total		181,255	394,017	499,601
1999-2004	Full-time	711,558	765,623	856,910
	Full-time small dredge	297,508	406,327	583,676
	Full-time trawl	678,464	689,639	638,055
1999-2004 Total		470,578	690,545	851,443

(1) All revenue numbers are adjusted for inflation and expressed in 2004 prices.

There does not seem to be a significant change in vessel size in terms of gross tonnage or horsepower during these periods. The average revenue per vessel is higher, however, for larger vessels compared to vessels with smaller gross tonnage (Table 41).

Table 42 shows revenue per full-time vessel by region determined according to the homeport of the vessel. The average revenue per vessel home ported in New England tends to be higher than the Mid-Atlantic vessels probably because New England vessels are larger on the average than the vessels in Mid-Atlantic (Table 43). Full-time vessels derive almost all their revenue from scallops (at least 90% or over), while for part-time vessels average revenue earned from scallops constitute 43% to 73% of their annual revenue depending on the gear type and location of the vessels (Table 44).

Table 42. Scallop revenue per full-time vessel by region (determined by home state).

Period	Permit category	Mid-Atlantic	New England	Grand Total
1982-1988	Full-time	657,510	1,086,112	870,756
	Full-time small dredge	181,836	164,261	177,561
	Full-time trawl	35,462		35,462
1982-1988 Total		577,890	1,046,792	796,538
1989-1993	Full-time	608,367	939,520	782,779
	Full-time small dredge	144,057	400,139	166,570
	Full-time trawl	333,693		333,693
1989-1993 Total		513,744	930,180	706,716
1994-1998	Full-time	418,864	530,241	476,666
	Full-time small dredge	108,677	390,226	129,688
	Full-time trawl	387,205		387,205
1994-1998 Total		377,741	528,610	446,668
1999-2004	Full-time	776,998	868,762	823,848
	Full-time small dredge	346,294	522,850	378,764
	Full-time trawl	683,092		683,092
1999-2004 Total		691,392	851,385	762,315

Table 43. Average gross tonnage of full-time vessels by region.

Period	Permit category	Mid-Atlantic	New England	Grand Total
1982-1988	Full-time	152	176	164
	Full-time small dredge	122	109	119
	Full-time trawl	128		128
1982-1988 Total		148	173	160
1989-1993	Full-time	152	176	165
	Full-time small dredge	114	115	114
	Full-time trawl	122		122
1989-1993 Total		144	175	158
1994-1998	Full-time	152	177	165
	Full-time small dredge	107	121	108
	Full-time trawl	121		121
1994-1998 Total		143	176	158
1999-2004	Full-time	150	173	162
	Full-time small dredge	113	109	112
	Full-time trawl	118		118
1999-2004 Total		141	170	153
Grand Total		143	173	157

Table 44. Percentage of Revenue from Scallops (2004).

Permit Category	Mid-Atlantic	New England	Grand Total
Full-time	97%	97%	97%
Full-time small dredge	93%	99%	95%
Full-time trawl	95%		95%
Part-time	73%	43%	58%
Part-time small dredge	68%	55%	66%
Part-time trawl	58%		58%
Occasional trawl	9%		9%
Grand Total	91%	96%	93%

4.5.4 General Category Fleet

There has been a significant increase in the number of vessels with general category permits participating in the scallop fishery during the recent years (Table 35). This has been the result of increase in scallop abundance combined with an increase in the price of scallops especially during 2005, which made general category scallop fishing quite profitable for some vessels. General category scallop landings increased from 1.8 million lb. in 2003 to 5.6 million lb. in 2005. As a result, the share of scallop landings by general category vessel increased from 3.04% in 2003 to 12.30% in 2005 (first 8 months of the fishing year) of total scallop landings (Table 45). Landings by the limited access vessels constituted only a small proportion of the general category landings.

Table 45. General category landings by permit and gear type

Year	Total general category landings**	Percent of total landings	By general category permits	By limited access permits	Dredge	Scallop trawl	Finfish trawl	Other
1994	0.2	1.3%	1.14%	0.16%	70.3%	26.7%	2.7%	0.3%
1995	0.4	2.3%	2.10%	0.20%	89.3%	3.3%	5.2%	2.2%
1996	0.6	3.5%	3.21%	0.29%	87.2%	0.2%	2.8%	9.7%
1997	0.5	4.0%	3.40%	0.60%	94.3%	0.1%	4.1%	1.4%
1998	0.4	3.9%	2.53%	1.37%	85.2%	4.6%	8.5%	1.7%
1999	0.4	2.0%	1.03%	0.97%	59.1%	19.8%	11.3%	9.8%
2000	1.5	4.5%	3.80%	0.70%	39.6%	4.4%	54.2%	1.9%
2001	2.2	4.8%	4.33%	0.47%	75.1%	7.6%	12.6%	4.8%
2002	1.3	2.7%	2.35%	0.35%	87.5%	4.6%	5.5%	2.4%
2003	1.8	3.3%	3.04%	0.26%	76.1%	11.4%	10.0%	2.4%
2004	3.6	5.8%	5.35%	0.45%	68.7%	12.1%	15.7%	3.5%
2005*	5.6	13.0%	12.30%	0.70%	NA	NA	NA	NA

*All figures for 2005 are preliminary. Landings and revenues for 2005 include 9 months from March to October 2005.

For other items, 2005 data includes end of June.

** Includes general category landings by limited access vessels as well.

The increase in the participation in the general category fishery in 2004 is also evident from Table 47. The number of active general category vessels increased from 352 in 2003 to 476 in 2004, and the total general category landings increased from approximately 1.6 million lb. to 3.0 million lbs. during the same years. The landings by 233 new entrants comprised 39% of total general category landings in 2004, while the landings by vessels that were active both in 2003 and 2004 totaled 1.7 million lb. (Table 46).

Table 46. General category vessel characteristics and activity in 2003 and 2004.

Year	Data	Active in 2003	New activity in 2004	Grand Total
2003	Number of vessels	352		352
	Gross Tonnage	53		53
	Length	53		53
	Crew size	3		3
	Scallop lb. per trip	183		183
	Total number of trips	6,010		6,010
	Total scallop landings	1,663,113		1,663,113
	% of total scallop landings	100%	0%	100.00%
	2004	Number of vessels	243	233
Gross Tonnage		59	70	64
Length		55	58	56
Crew size		3	4	3
Scallop lb. per trip		292	418	354
Total number of trips		5,647	3,271	8,918
Total scallop landings		1,795,119	1,161,382	2,956,501
% of total scallop landings		61%	39%	100%

Table 47 shows that participation by vessels home-ported both in New England and Mid-Atlantic regions increased in 2004, by almost at the same rate. In terms of area-fished, however, most of the new activity by the general category vessels occurred in Mid-Atlantic, with new entrants in this area landing 22% of general category scallops in 2004. Table 48 shows composition of landings by major gear types and by specific area fished in the same year. As expected major proportion of scallops are landed by scallop dredges in each area. The shift in geographic activity by the general category fleet to Mid-Atlantic could also be clearly seen from Table 53. The share of Mid-Atlantic in total general category scallop landings increased from 47% in 2003 to almost 62% in 2004. The vessel trip report (VTR) for the first five months of 2005 shows that this trend continues with an increase in the share of Mid-Atlantic to 73%.

Table 47. General category activity by region of homeport in 2004.

Year	Data	New Activity in 2004		Grand Total
		Active in 2003		
Mid Atlantic	Number of vessels	103	83	186
	Gross Tonnage	69	64	67
	Length	59	58	59
	Crew size	3	3	3
	Total number of trips	3,083	1,717	4,800
	Total scallop landings	1,098,329	604,678	1,703,007
	% of total scallop landings	64.49%	35.51%	100.00%
New England	Number of vessels	140	150	290
	Gross Tonnage	51	73	62
	Length	51	58	55
	Crew size	3	4	3
	Total number of trips	2,564	1,554	4,118
	Total scallop landings	696,790	556,704	1,253,494
	% of total scallop landings	55.59%	44.41%	100.00%

Table 48. General category landings by gear and area-fished, and according to new activity (as a % of total general category landings in 2004).

Area fished	Gear	Active in 2003	New Activity in 2004	Grand Total
Georges Bank	DREDGE,SCALLOP,SEA	10.06%	8.29%	18.36%
	OTTER TRAWL,BOTTOM,FISH	1.53%	2.21%	3.74%
Georges Bank Total		11.59%	10.50%	22.09%
Gulf of Maine	DREDGE,SCALLOP,SEA	5.61%	1.39%	7.00%
	OTTER TRAWL,BOTTOM,FISH	0.64%	0.03%	0.67%
	OTTER TRAWL,BOTTOM,SHRIMP	0.01%	0.00%	0.01%
Gulf of Maine Total		6.25%	1.42%	7.67%
Mid-Atlantic	DREDGE,SCALLOP,SEA	24.06%	14.54%	38.60%
	OTTER TRAWL,BOTTOM,FISH	6.78%	3.82%	10.60%
	OTTER TRAWL,BOTTOM,SCALLOP	8.14%	3.84%	11.98%
	OTTER TRAWL,BOTTOM,SHRIMP	0.05%	0.00%	0.05%
Mid-Atlantic Total		39.03%	22.20%	61.23%
Southern New England	DREDGE,SCALLOP,SEA	2.69%	2.91%	5.60%

	OTTER TRAWL,BOTTOM,FISH	0.02%	0.77%	0.80%
Southern New England Total		2.71%	3.68%	6.40%
Unspecified	DREDGE,SCALLOP,SEA	1.34%	0.16%	1.49%
	OTTER TRAWL,BOTTOM,FISH	0.11%	0.78%	0.89%
	OTTER TRAWL,BOTTOM,SCALLOP	0.22%	0.00%	0.22%
	OTTER TRAWL,BOTTOM,SHRIMP	0.01%	0.00%	0.01%
Unspecified Total		1.68%	0.93%	2.61%

Table 49. General category landings by gear and fishing area by year and gear type (as a % of total general category landings).

Area Fished	GEAR	2003	2004	2005
Georges Bank	DREDGE,OCEAN QUAHOG/SURF CLAM	0.02%	0.01%	0.00%
	DREDGE,OTHER	0.00%	0.00%	0.03%
	DREDGE,SCALLOP,SEA	20.43%	18.14%	1.68%
	OTTER TRAWL,BOTTOM,FISH	0.73%	3.69%	2.56%
	OTTER TRAWL,BOTTOM,SCALLOP	0.02%	0.00%	0.00%
Georges Bank Total		21.21%	21.84%	4.28%
Gulf of Maine	DREDGE, URCHIN	0.00%	0.00%	0.00%
	DREDGE,OCEAN QUAHOG/SURF CLAM	0.13%	0.00%	0.00%
	DREDGE,SCALLOP,SEA	26.29%	6.92%	16.36%
	OTTER TRAWL,BOTTOM,FISH	0.54%	0.66%	0.01%
	OTTER TRAWL,BOTTOM,SCALLOP	0.08%	0.00%	0.74%
	OTTER TRAWL,BOTTOM,SHRIMP	0.01%	0.01%	0.00%
Gulf of Maine Total		27.05%	7.58%	17.12%
Mid-Atlantic	DREDGE,OCEAN QUAHOG/SURF CLAM	1.23%	1.16%	6.09%
	DREDGE,SCALLOP,SEA	25.90%	38.15%	60.91%
	OTTER TRAWL,BOTTOM,FISH	7.56%	10.47%	3.78%
	OTTER TRAWL,BOTTOM,SCALLOP	11.77%	11.84%	1.07%
	OTTER TRAWL,BOTTOM,SHRIMP	0.93%	0.05%	0.76%
Mid-Atlantic Total		47.39%	61.67%	72.61%
Southern New England	DREDGE,SCALLOP,SEA	0.12%	5.53%	4.48%
	OTTER TRAWL,BOTTOM,FISH	0.09%	0.79%	0.02%
Southern New England Total		0.22%	6.32%	4.50%
Unspecified	DREDGE,OCEAN QUAHOG/SURF CLAM	0.00%	0.01%	0.21%
	DREDGE,SCALLOP,SEA	3.59%	1.48%	1.28%
	OTTER TRAWL,BOTTOM,FISH	0.54%	0.87%	0.02%
	OTTER TRAWL,BOTTOM,SCALLOP	0.00%	0.22%	0.00%
	OTTER TRAWL,BOTTOM,SHRIMP	0.00%	0.01%	0.00%
Unspecified Total		4.13%	2.59%	1.50%
Grand Total		100.00%	100.00%	100.00%

Another trend in the general category fishery was the increase in the number of vessels that landed 300 lb. or more from any one given trip. According to the VTR data, in 2003 calendar year, only 158 vessels, that is less half of the general category fleet had a trip landing equal or in excess of 300 lb. In 2004, however, this number increased to 294 vessels comprising over 62% of the general category

vessels. As Table 50 shows, over 96% of the scallops in 2003 and over 98% in 2004 were landed by these vessels. There seems to be an equal number of vessels in 2004 that landed 300 lb. or over in any one trip whether or not they participated in the general category fishery in 2003 or only in 2004 (Table 51). Majority of general category vessels took 10 trips or less both in 2003, 203 out of 332 vessels, and in 2004, 289 out of 476 vessels (Table 52). Over 40% of the scallops were landed in each year, however, by a few vessels that took 70 trips or more per year.

Table 50. Landings and number of general category vessels by maximum scallop pounds per trip.

Maximum lb. from a trip	Data	2003	2004
40 lb. or less	Number of vessels	83	73
	% of total scallop landings	0.4%	0.1%
41 to 299lb.	Number of vessels	111	108
	% of total scallop landings	3.7%	1.7%
>=300 lb.	Number of vessels	158	294
	% of total scallop landings	96%	98%
Total Number of vessels		352	475
Total % of total scallop landings		100%	100%

Table 51. Landings and number of general category vessels by maximum scallop pounds per trip and activity (2004).

Maximum lb. from a trip	Data	Active in 2003	New activity in 2004	Grand Total
40 lb.or less	Number of vessels	40	33	73
	% of total scallop landings	0.2%	0.1%	0.1%
41 to 299lb.	Number of vessels	54	54	108
	% of total scallop landings	1.8%	1.6%	1.7%
>=300 lb.	Number of vessels	148	146	294
	% of total scallop landings	98%	98%	98%
Total Number of vessels		242	233	475
Total % of total scallop landings		100%	100%	100%

Table 52. General category vessels by the number of scallop trips in a year.

Number of trips	Data	2003	2004
10 trips or less	Number of vessels	203	289
	% of total scallop landings	6%	11%
	Number of trips per vessel	3	3
	Average scallop Lb. per trip	136	398
10-29 trips	Number of vessels	80	89
	% of total scallop landings	14%	13%
	Number of trips per vessel	16	18
	Average scallop Lb. per trip	185	236
30-49 trips	Number of vessels	30	41
	% of total scallop landings	20%	17%
	Number of trips per vessel	37	39
	Average scallop Lb. per trip	299	288
50-69 trips	Number of vessels	15	25
	% of total scallop landings	15%	17%
	Number of trips per vessel	57	58
	Average scallop Lb. per trip	288	349
>= 70 trips	Number of vessels	24	32
	% of total scallop landings	45%	42%
	Number of trips per vessel	87	102
	Average scallop Lb. per trip	357	369
Total Number of vessels		352	476
Total % of total scallop landings		100%	100%
Total Number of trips per vessel		17	19
Total Average scallop Lb. per trip		183	354

About 47% of the scallops in 2003 and 46% of scallops in 2004 were landed by a small group of vessels that derived 90% or more of their annual revenue from scallop fishing (Table 53). On the other hand, there were 96 vessels in 2003, and 149 vessels in 2004 that derived less than 5% of their annual revenue from scallops. Scallop revenue of all group of vessels shown in Table 53 increased in 2004 compared to 2003, however. The revenue data in Table 53 was estimated from the dealer's data since no data item exists in VTR.

Table 53. General category vessel by percentage of annual revenue from scallops (2004)

Year	Data	<5%	5%-19%	20%-39%	40%-59%	60%-79%	80%-89%	>=90%	UNKNOWN	Grand Total
2003	Number of vessels	96	25	19	15	6	7	67	117	352
	Gross Tonnage	89	48	33	42	22	33	37	43	53
	Length	64	55	47	50	46	46	48	48	53
	Crew size	4	3	3	3	3	2	3	3	3
	Scallop lb. per trip	131	222	368	321	371	187	288	99	183
	Annual scallop revenue	2,777	22,954	40,528	77,326	98,579	50,168	54,561		22,206
	Annual Total revenue	314,879	184,152	123,467	158,479	141,873	55,209	60,591		190,862
	Scallop revenue as a % of total revenue	1%	11%	27%	51%	68%	85%	99%		39%
	Total number of trips	458	431	450	678	334	339	2,395	925	6,010
	Total scallop landings	56,712	122,097	163,837	246,784	125,845	74,718	777,781	95,339	1,663,113
	% of total scallop landings	3%	7%	10%	15%	8%	4%	47%	6%	100%
2004	Number of vessels	149	32	15	21	14	16	96	133	476
	Gross Tonnage	96	55	66	47	32	59	48	48	64
	Length	66	54	59	52	45	56	53	50	56
	Crew size	4	3	3	3	3	3	3	3	3
	Scallop lb. per trip	413	270	279	376	374	329	299	353	354
	Annual scallop revenue	6,941	27,290	47,997	85,348	97,023	74,611	71,813		31,376
	Annual Total revenue	338,373	199,174	174,111	146,913	109,016	84,658	74,451		211,417
	Scallop revenue as a % of total revenue	1%	12%	29%	49%	72%	86%	99%		41%
	Total number of trips	830	532	411	902	678	663	3,968	934	8,918
	Total scallop landings	203,908	172,928	142,564	354,914	268,976	236,390	1,365,151	211,670	2,956,501
	% of total scallop landings	7%	6%	5%	12%	9%	8%	46%	7%	100%

4.5.5 Fishing Practices and Use of Space

In general, sea scallops are found in the Northwest Atlantic Ocean from North Carolina to Newfoundland along the continental shelf, typically on sand and gravel bottoms (Packer et al. 1999). In terms of the U.S. Atlantic scallop fishery, it is generally described as occurring in three areas: the Gulf of Maine, Georges Bank, and the Mid-Atlantic. The bulk of the Gulf of Maine landings are from relatively shallow waters (<40m) near-shore (NMFS 2004c). Gulf of Maine landings account for a very small portion of the overall annual scallop landings. In 2003, Gulf of Maine scallop landings were only 254 mt — less than 1% of the total 2003 landings (NMFS 2004c). Landings from Georges Bank have averaged almost 5000 mt annually during 1999-2003 (NMFS 2004c). However, it has been the Mid-Atlantic that has seen the largest growth in scallop landings. These areas have been experiencing an upward trend in both recruitment and landings since the mid-1980s (NMFS 2004c). Landings during each of the last 4 years (2000-2003) set new records for the Mid-Atlantic region with landings of over 19,000 mt in 2003 (NMFS 2004c).

The scallop fishery over Georges Bank and in the Mid-Atlantic is a deeper water fishery in comparison to the Gulf of Maine. Concentrations of scallops occur within a narrow depth band in the Mid-Atlantic from about the 40 meter isobath to the 200 meter isobath, throughout the Hudson Canyon Access Area, around the perimeter of Georges Bank, including the Great South Channel (NEFMC 2001). Therefore, it is not surprising that most scallops are harvested at depths between 30 and 100 meters in the Georges Bank and the Mid-Atlantic areas (NMFS 2004c). Each of these areas is also more productive in terms of scallop landings as compared to the Gulf of Maine.

The location of scallop fishing effort is often characterized based on area fished. Eight scallop resource areas have been identified. These are:

- Gulf of Maine (statistical areas 511-515);
- South Channel (statistical areas 521, 522, and 526);
- Georges Bank North (statistical areas 561 and 562)
- Georges Bank South (statistical area 525);
- Southern New England (statistical areas 537-539);
- New York Bight (statistical areas 611-616);
- Delmarva (statistical areas 621-623, 625-627); and,
- Virginia/North Carolina (statistical areas 631-638) (NEFMC 2000a) (Appendix A).

Among the eight areas, three were major production areas for the 2003 scallop fishing year (March 1, 2003 - February 29, 2004) and accounted for 90% of the total scallop landings (NMFS Preliminary Fisheries Statistics). These three areas and their respective contribution to the scallop landings are: South Channel (11%), New York Bight (35%), and Delmarva (44%) (NMFS Preliminary Fisheries Statistics).

Despite an image of a highly mobile fleet, many fishermen tend to fish in the same areas and in areas close to their home and landing ports. The majority of vessels—both limited access and general category vessels—caught the majority of their annual scallop pounds in just one statistical area (Table 54 and Table 55). Virtually all general category vessels did so, as well as usually at least half of limited access vessels in most years. This can be for any number of reasons: that they fish with small boats and/or are day-trip boats, that they have extensive knowledge of particular but not all areas, and so on. The implication for the different area management alternatives is to reinforce that any areas considered for closure must be especially sensitive of the fishermen and fishing communities that may be exclusively dependent on them.

Table 54. General Category Vessels catching at least half of their annual scallop catch in one statistical area, Fishing years 1995-2004. Source: 1994-2005 logbooks.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
No. of Vessels	142	162	174	148	163	174	236	240	269	400
Percentage of Active Vessels	96.6	98.2	98.3	96.7	98.2	98.3	97.9	98.8	96.8	94.1
Average Percentage of Landings from One Statistical Area	94.1	94.7	94.8	94.0	94.5	93.2	92.8	90.7	92.6	88.0

Table 55. Limited Access Vessels catching at least half of their annual scallop catch in one statistical area, Fishing years 1995-2004. Source: 1994-2005 logbooks.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
No. of Vessels	129	131	115	141	102	108	150	170	179	112
Percentage of Active Vessels	53.5	53.0	50.9	61.3	41.6	41.2	52.6	58.0	58.1	35.2
Average Percentage of Landings from One Statistical Area	74.8	71.3	70.0	72.9	67.1	67.7	68.2	68.6	70.4	66.2

Moreover, not all areas are the same: the spatiality of fishing grounds implies that not only are some areas biologically more productive than others, but that fishermen choose to fish in particular areas for a myriad of other social as well as economic reasons. Day-trippers, for example, may fish close to shore because of a personal and social desire to come back home every night, even if that might mean for some a lower annual income. The areas that line the coast of New England, and to a lesser extent, the Mid-Atlantic, seem to be more important in terms of annual catch dependence, though not necessarily in sheer volume. This is especially true for general category vessels, which tend on average to be smaller, but also for some limited access vessels as well. An expansion of the economic component of this SAFE Report can be found in Appendix I, which provides extensive information on the fishing characteristics by statistical area as well as range of fishing activities as reflected by other fisheries participated and other permits held by both limited access and general category vessels.

The commercial scallop fishery operates year round (Hart 2001). Seasonal peaks in sea scallop landings are evident but must be considered in light of management measures that can influence when vessels fish. For example, part of Closed Area II over Georges Bank was reopened to scallop fishing for a portion of the 1999 scallop fishing year. The seasonality of the opening likely affected landings for those months when the closed area was accessible to scallop fishing. Similarly, in 2001-2003, the Hudson Canyon Access Area in the Mid-Atlantic was accessible to scallop fishers for a portion of each scallop year which may have influenced the trend in monthly landings.

4.5.6 The scallop ports

While the fleet is spread throughout the eastern seaboard, the majority of limited access vessels are found in Massachusetts, Virginia, New Jersey, and North Carolina (SAFE 2005, Tables 17 and 19). For general category permits, the majority operates out of Massachusetts, Maine and New Jersey (SAFE 2005, Tables 18 and 20). Most limited access vessels are large throughout, with the exception of Maine; the general category vessels are fairly small throughout, though individual vessels do vary. For the limited

access fleet, the homeports New Bedford, Cape May, Newport News and Norfolk have the highest number of permitted vessels (SAFE 2005, Table 21). For the general category fleet, the homeports New Bedford, Gloucester, Cape May, Point Judith, and Chatham have the highest number of permitted vessels (SAFE 2005, Table 22). These vessels may be owned by individual owner-operators, or by fishing companies which own multiple vessels. In 1996, it was estimated that 69 percent of fishing companies owned only one permit, while 9 companies owned between 6 and 10 permits, or over one-fourth of total permits (Edwards 2001). While ongoing work is seeking to update these numbers, informal interviews with fishermen have indicated increasing consolidation in recent years (Olson, in review).

Vessels land their catch at different ports at different times of the year, or at ports other than their homeports. The relation between these different geographies has significance for understanding the communities to which fishermen belong, the mutual influences between communities—as places for socialization and social organization—and the impacts of management. The top ten landing ports have stayed relatively consistent in recent years, with New Bedford dominating. For most of these ports, scallops account for the majority of the ports' landed value. There have been some changes, however, with Hampton VA seeing an increasingly smaller share of total landings, and other port areas—namely Cape Cod ports—seeing an increasing importance from scallops. Many of the top homeports are the same as the landing ports, with exceptions such as Fairhaven (where many vessels offload in New Bedford), and North Carolina vessels. Over half of the ports in table 12 had a significant portion (at least 10%) of landed value of scallops from landings by general category vessels. These ports are (with percentage of scallops landed in that port by general category vessels in 2003 in parentheses): Hampton Bays (100), Wellfleet (99), Chatham (98), Rockport (95), Harwich Port (90), Provincetown (90), Sandwich (84), Gloucester (83), Newburyport (77), Ocean City (62), Chincoteague (47), Other Barnstable (29), Barnegat Light (17), Wildwood (13), Point Judith (11), Point Pleasant (10). Over one-third of top homeports also had a significant portion (at least 10%) of landed value of scallops from landings by general category vessels. These ports are (with percentage of scallops landed in that port by general category vessels in 2003 in parentheses, unless otherwise noted): Wellfleet (100), Provincetown (100), Sandwich (100), Chatham (100), Brunswick (100), Toms River (100), Lubec (100), Bucks Harbor (100), Chincoteague (100), Tiverton (100), Morehead City (100), Newburyport (99), Engelhard (40), Gloucester (39), Owls Head (38), Belhaven (28), Wildwood (27), Barnegat Light (17), Spruce Head (13), and Barnstable (12 percent in 2004). See Appendix I, Tables 23 to 24 for detailed information on the fishing activity by port.

5.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

5.1 Biological Impacts

5.1.1 Impacts on the Sea Scallop Resource

5.1.1.1 Area Specific Limits on Fishing by Limited Access Vessels

The overall biological impacts of allocating area specific limits by total pounds per vessel or maximum number of trips with a possession limit have similar impacts. Both options control the total pounds of scallops harvested from the access areas, preventing overfishing and depletion of the scallop resource. No possession limit could have negative effects on meat quality.

5.1.1.2 Area Rotation Measures and Allocations

This action considered a number of modifications to the rotational area management program as well as a range of open area DAS options. Due to the nature of rotational area management, most of the biological analyses are interrelated; thus impacts cannot always be analyzed as stand alone alternatives. Therefore, the biological projections include many of the measures in aggregate. For example, the biological impacts of closing the Delmarva closure, depend on whether or not the Elephant Trunk area will be open, how many open area DAS will be allocated, etc. See Table 26 that describes the hierarchical nature of the alternatives under consideration. When the analyses can be separated out they have been in the following sections.

A total of ten management scenarios were examined, which can be split into five groups, as described in detail below. The alternatives are summarized in Table 56. The list includes: the No Action Alternative, the Status Quo Alternative, four variations of open area DAS alternatives with access to ETA (18K, 20K, 24.7 K and 30K), one alternative that extends the Hudson Canyon Area with 20K DAS and ETA access, and three alternatives with the Delmarva Area open or closed with various open area DAS. Table 57 describes the hierarchical nature of the various alternatives, identifying what area rotation measures and allocations have been analyzed for each alternative.

No Action

The Hudson Canyon Access Area would revert to fully open management on March 1, 2006. The Elephant Trunk Closed Area would become fully opened to fishing on March 1, 2007. Full time limited access vessels would be allocated 67 open area DAS for each year starting in 2006, as specified in Amendment 10 and Framework 16, corresponding to about 24700 aggregate DAS, including an allocation of 3500 DAS to account for general category activity. Two out of the three groundfish closed access areas would continue to be fished at $F = 0.2$, according to the specifications laid out in Amendment 10 and Framework 16. The remainder of the groundfish closed areas would remain closed to scallop fishing.

Status Quo

The Hudson Canyon Access Area would revert to fully open management on March 1, 2006. The Elephant Trunk Closed Area would open under controlled access on March 1, 2007 for three years, using the principle of time-averaging, as discussed in Amendment 10. The fishing mortalities during this period

would be $F = 0.32, 0.4$ and 0.48 . After these three years, the area would revert to fully open status. Two out of the three groundfish closed access areas would continue to be fished at $F = 0.2$, according to the specifications laid out in Amendment 10 and Framework 16. The remainder of the groundfish closed areas would remain closed to scallop fishing. Full time limited access vessels would be allocated 67 DAS in FY 2006. Allocations in later years would be made so that the resource-wide fishing mortality equals the Amendment 10 target of $F = 0.2$.

**Modified Elephant Trunk Reopening and Groundfish Closed Area Access
(FW18-15K open DAS, FW18-20K open DAS, FW18-24.7K open DAS, FW18-30K open DAS)**

In all scenarios in this group, the controlled access period for the Elephant Trunk area would be extended to five years, starting on March 1, 2007 and ending February 29, 2012. Fishing mortalities for the five year period would be ramped up more slowly: $F = 0.16, 0.24, 0.32, 0.4$ and 0.48 . In addition, access to the groundfish closed areas would be modified, so that all three areas would be open in 2006 (two trips each to the NLS and CL-II access areas, and one trip to the CL-1 access area), with the 2/3 rotation resuming in 2007. The Hudson Canyon Access Area would revert to fully open status on March 1, 2006. For all but the last scenario in this group, open area DAS for 2007 and beyond were calculated to make the resource-wide fishing mortality 0.2. Four different options were simulated for aggregate open area DAS for FY 2006: 15000, 20000, 25000 and 30000. The fifth alternative in this group assumes 20000 DAS for both FY 2006 and 2007, with open area DAS calculated to result in $F = 0.2$ for 2008 and beyond.

**Extended Hudson Canyon Access Program
(FW18-2Yr HCA restriction)**

Policies for the Elephant Trunk and groundfish access areas are the same as III above. The Hudson Canyon Access Area would remain under controlled access for two more years, with no new trips being allocated to the area. Unused trips from 2005 could be used in 2006 or 2007. It was assumed that landings from this area would be spread out equally among the two or three year period from 2005 until the end of controlled access. Aggregate open area DAS for 2006 are 20,000 and DAS for 2007 and beyond were specified to meet the resource-wide $F = 0.2$ target.

**New Delmarva Closure
(DMV-18K open DAS, DMV-20K open DAS in 2006, and DMV-20K in 2006-2007)**

The Elephant Trunk and groundfish area access policies would be the same as III and IV above. The Hudson Canyon Access Area controlled access program would be extended for two more years, as discussed in IV above. A new rotational closed area, south of the Elephant Trunk closure, would close when the Elephant Trunk area reopens. This area was identified on the basis of strong recruitment observed during the 2005 NMFS survey, whereas the simulations start with the 2004 survey, and assume typical recruitment for subsequent years. For this reason, these simulations underestimate both the relative and absolute benefits of the new closure. Nonetheless, the simulations give an idea of the impact of the new closure on future landings and on the areas that remain open to fishing. The closure is assumed to last for three years, after which there are three years of controlled access, at $F = 0.32, 0.4$ and 0.48 . In the first run of this set, open area aggregate DAS was set at 20,000 for 2006 and adjusted to meet the $F = 0.2$ target in subsequent years. Aggregate open area DAS was 20,000 for both 2006 and 2007 in the second run, and 18,000 for both years in the third run. In both cases, for years beyond FY 2007, open area DAS were allocated to meet the $F = 0.2$ target.

Table 56 Management Scenarios

Simulation	Open Area DAS 2006	Open Area DAS - 2007	Open Area DAS 2008-2019	Georges Bank Area Rotation Schedule	ETA Access	Hudson Canyon Area Access	Delmarva
No Action	24700	24700	24700	A10	Fully Open	Fully open	No closure
Status Quo	24700	29700/F=0.2	F=0.2	A10	3yr ramp	Fully open	No closure
FW18-18K	15000	26300/F=0.2	F=0.2	Proposed F18	5 yr ramp	Fully open	No closure
FW18-20K	20000	25300/F=0.2	F=0.2	Proposed F18	5 yr ramp	Fully open	No closure
FW18-24.7K	24700	25049/F=0.2	F=0.2	Proposed F18	5 yr ramp	Fully open	No closure
FW18-30K	30000	24600/F=0.2	F=0.2	Proposed F18	5 yr ramp	Fully open	No closure
FW18-2Yr HCA	20000	25900/F=0.2	F=0.2	Proposed F18	5 yr ramp	2yr C. Acc	No closure
DMV-18K	20000	28145/F=0.2	F=0.2	Proposed F18	5 yr ramp	2yr C. Acc	Closure
DMV-20K in 2006	20000	20000	F=0.2	Proposed F18	5 yr ramp	2yr C. Acc	Closure
DMV-20K in 2006-7	18000	18000	F=0.2	Proposed F18	5 yr ramp	2yr C. Acc	Closure

Table 57. Projection scenarios performed to analyze the effect of area rotation alternatives

Alternative	Open area DAS range Section 3.3.2				
	15,000 Low	18,000	20,000 Preferred	24,700 Baseline	30,000 High
No Action Section 3.2.1				No Action	
Status quo Section 3.2.2				Status quo	
Georges Bank area rotation Section 3.3.1.2 With Elephant Trunk Area access Section 3.3.1.4	FW 18 – 15K open DAS		FW 18 – 20K open DAS	FW 18 – 24.7K open DAS	FW 18 – 30K DAS
As above with Hudson Canyon Area restricted access Section 3.3.1.3			FW 18- 2Yr HCA restriction		
As above with Delmarva Area closure Section 3.3.1.6		DMV – 18K open DAS	DMV – 20k open DAS in 2006 ----- DMV closure – 20K open DAS in 2006 and 2007 (proposed action)		

5.1.1.2.1 Results and Discussion of biological projections

Performance of the various options can be assessed in the short-term (Table 58) or the long-term (Table 59). Short-term performance measures include biomass at the expiration of Framework 18 (2008), as well as mean annual landings, days-at-sea, and area swept by the fishery during the two years that the framework is in effect. Biomass is highest under the DMV-18K simulation, which combines a relatively low 18000 aggregate DAS for the open areas each year with the implementation of the new Delmarva area. The lowest predicted biomass is for simulation FW18-30K, which has high open area DAS allocations and

no new closure or additional protection to the Hudson Canyon Access Area. All scenarios predict record landings in excess of 30000 MT meats during 2006-7. Highest short-term landings are predicted for the FW18-30K scenario, which averages nearly 5000 MT/y higher than the No Action alternative. The No Action scenario would produce the lowest short-term area swept, due especially to a very small predicted footprint in 2007, when nearly all effort would be concentrated in the Elephant Trunk and groundfish closed areas. Overall mean fishing mortalities during 2006-2007 are projected in all alternatives to be at or below the $F = 0.2$ target. However, this low F is in part due to low fishing mortalities in the groundfish and Elephant Trunk closed areas, which contain a majority of the scallop biomass. For this reason, it is important to examine fishing mortalities in open areas. Georges Bank open area fishing mortality rates are projected to be somewhat higher than optimal under all alternatives during the 2006-2008 period when Framework 18 would be in effect. These fishing mortalities are the highest in the alternatives where more days are allocated to the open areas, and when more areas are taken out of the open areas (e.g., the DMV-20K 2006 only scenario).

Because the model simulations are similar in many respects (e.g., similar groundfish closed area and Elephant Trunk access and long-term open area policies), it is to be expected that there will be only modest differences in the long-term results. The No Action alternative has the highest predicted long-term biomass and lowest long-term area swept because open area effort is more limited long-term than other scenarios. On the other hand, this alternative would produce an average of about 2000 MT/y less landings than any other alternative. Long-term results for all the other alternatives are similar because the same policy for open area allocations is used beyond the expiration of Framework 18 in 2008. Long-term landings are the highest for the DMV-18K alternative; this scenario also has one of the lowest mean area swept. The benefits of the Delmarva closure are underestimated in these simulations because they do not take into account the large year class observed during the 2005 survey.

Table 58 Short Term Summary (2006-2007 means except for biomass)

Simulation	Biomass 2008	Landings	Mean DAS	Area Swept	Overall F	Georges Bank Open Area F
No Action	10860	32109	31193	3049	0.15	0.28
Status Quo	10684	33874	33653	3739	0.16	0.37
FW18-18K	10829	33355	33671	4193	0.16	0.44
FW18-20K	10669	34551	35660	4846	0.17	0.50
FW18-24.7K	10506	35775	37887	5627	0.18	0.56
FW18-30K	10347	36927	40340	6568	0.19	0.62
FW18-2Yr HCA	10839	36044	38154	5737	0.17	0.60
DMV-18K	10824	36254	39262	6383	0.17	0.67
DMV-20K in 2006	11077	33932	35014	4880	0.16	0.54
DMV-20K in 2006-7	11218	32712	33038	4227	0.15	0.48

Table 59 Long Term Summary (2006-2020 means).

Simulation	Biomass	Landings	Standard Deviation of Landings	Area Swept	DAS	Overall F
No Action	10929	33499	2562	2170	30564	0.16
Status Quo	9622	35515	3970	3114	33842	0.20
FW18-18K	9651	35448	3903	3255	33915	0.19
FW18-20K	9583	35392	2994	3344	34029	0.20
FW18-24.7K	9529	35325	2392	3438	34143	0.20
FW18-30K	9471	35256	2169	3558	34302	0.20
FW18-2Yr HCA	9668	35817	2994	3400	34449	0.20
DMV-18K	9654	35816	3054	3522	34629	0.20
DMV-20K in 2006	9733	35889	3242	3333	34360	0.19
DMV-20K in 2006-7	9805	35911	3513	3233	34204	0.19

5.1.1.2.2 Allocations

For purposes of estimating 2006 and 2007 allocations, the PDT divided the total amount to be allocated (TAC in controlled access areas; DAS used in open areas) by the number of permitted vessels using DAS in 2004. All other permits were deemed inactive and would not contribute to additional DAS use in 2006 or 2007. The number of permits issued in 2005 at the time of this analysis were 305 full-time (97% using DAX in 2004), 27 part-time (80% using DAS), and 3 occasional (25% using DAS). Accounting for the differential TAC and DAS allocations for part-time (40%) and occasional (8.33%) vessels, these values are equal to 316.1 full-time equivalent permits and 304.6 full-time equivalent permits using DAS.

5.1.1.2.3 Controlled access area trips

Using the above number of active vessels, each allocated controlled access area trip is estimated to generate 2,580 mt of scallop landings. For No Action and Status quo alternatives, the TAC equivalent to an F=0.2 target, less a five percent TAC set-aside¹⁹, was divided by the 2,580 mt rounded up or down to the nearest whole number (but never less than one trip).

The mortality target range (F=0.2 to F=0.3) in the Framework 18 rotation alternatives provided a bit more latitude to set a TAC equivalent to the whole number of trips to be allocated. TACs were estimated in units of 2,650 mt, so that the resultant fishing mortality fell between 0.2 and 0.3. These projections, therefore, are a better indicator of the expected catch and future biomass that results from allocating controlled access area trips. For CA I in 2007, a one-trip allocation would allow landings of 164% of the 1,565 mt TAC estimated with a fishing mortality target of F=0.20. Thus, the one trip allocation would allow landings for a TAC approximately equal to an F=0.30 mortality target.

¹⁹ Two percent research set-aside; one percent set-aside to fund mandatory observers; and a two percent set-aside for general category trip allocations.

Table 60. Estimated maximum number of trips allocated by area to achieve the TACs.

The percent of TAC allocated represents the catch as a proportion of the TAC if all trips are taken by the fleet and land the scallop possession limit.

Scenario	Area name	Fishing mortality target	Fishing year		Data	
			2006	2007	2006	2007
			Full-time controlled access areas trips	Percent of TAC allocated	Full-time controlled access areas trips	Percent of TAC allocated
Framework 18 - 20k open DAS 2006-07	Closed Area I access	0.2			1	164%
		0.32	1	97%	0	0%
	Closed Area II access	0			2	107%
		0.2	0	0%	5	73%
	Nantucket Lightship Area access	0.2	2	99%	1	
		0.25				
No action	Closed Area I access	0			0	0%
		0.2	1	148%	0	0%
	Closed Area II access	0			2	89%
		0.2	0	0%	1	70%
Nantucket Lightship Area access	0.2	2	121%	1		
Status quo	Closed Area I access	0			0	0%
		0.2	1	148%	0	0%
	Closed Area II access	0			2	89%
		0.2	0	0%	9	104%
	Nantucket Lightship Area access	0.32	2	121%	1	70%
		0.2				

5.1.1.2.4 Controlled access area possession limits

Scallop possession limits for limited access vessels fishing in controlled access areas would remain unchanged at 18,000 lbs. of scallop meats per trip. Following the management policy adopted in Framework 16/39, the part-time and occasional vessel trip allocations and possession limit would be adjusted such that the total amount that a part-time vessel can land from controlled access area trips would be 40% of the amount allowed by a full-time vessel. Likewise, the total amount that an occasional vessel can land from controlled access area trips would be 8.33% of the amount allowed by a full-time vessel. These allocations are equivalent to the proportional open area DAS allocations by permit category.

To calculate these values, a part-time trip allocation is determined by multiplying the full-time trips by 40% and rounding up to the next whole number. The possession limit is determined by multiplying the amount that a full-time vessel may land on all access area trips by 40%, and then dividing that by the number of trips (rounded up) that are allocated to a part-time vessel. Allocations and possession limits for occasional vessels are calculated in the same fashion with an 1/12th (8.33%) ratio. The table below gives the total trip allocations and possession limits by limited access permit category for the three types of area rotation alternatives.

Table 61. Total controlled access area trip allocations and possession limits by limited access permit category and fishing year.

Scenario	Fishing year	Data				
		Sum of Full-time controlled access areas trips	Sum of Part-time controlled access areas trips	Sum of Part-time possession limit	Sum of Occasional controlled access areas trips	Sum of Occasional possession limit
Framework 18 - 20k open DAS 2007-07	2006	5	2	18000	1	7500
	2007	7	3	16800	1	10500
No action	2006	3	2	10800	1	4500
	2007	3	2	10800	1	4500
Status quo	2006	3	2	10800	1	4500
	2007	12	5	17280	1	18000

5.1.1.2.5 Georges Bank Area Access Measures

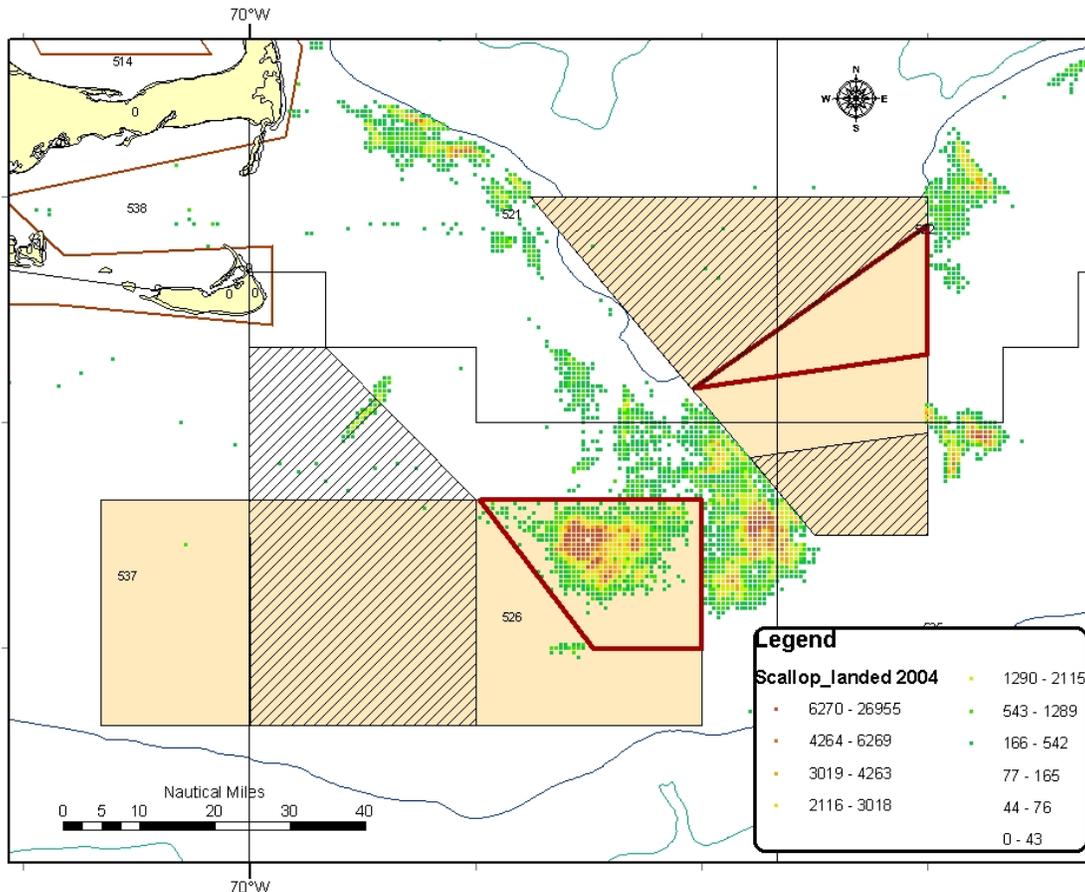
5.1.1.2.5.1 *Revise the Georges Bank area access schedule*

This action considered two alternatives to revise the access schedule on Georges Bank as well as the Status Quo Alternative. The Council selected the “Contingency Alternative” as the proposed action. The primary reason this alternative was selected is the result of the court’s decision in *Oceana v Evans* (08/02/05), which determined that EFH closures implemented under both Amendment 10 to the Scallop FMP and Amendment 13 to the Multispecies FMP apply to scallop vessels. As a result of this decision, the Closed Area I access area would be restricted to a smaller area than had been analyzed in support of the Framework 18 Georges Bank access alternative. Because both the Amendment 10 and Amendment 13 habitat closed area boundaries were ordered by the court concentrating the planned amount of Closed Area I effort into such as small area would cause localized depletion. This section analyzes the biological impacts of the EFH closures and how they impact area rotation.

The biological projections in this framework document assume that the entire part of the access areas defined in Framework 16/39 (see Section 5.1.1.2.1) would be open to scallop fishing. The lawsuit ruling affects the access area boundaries in Closed Area I and the Nantucket Lightship Area, but does not affect the Closed Area II access area boundaries.

Fishing mortality and other estimated variables are therefore contingent on catching scallops from the biomass that is projected to be available in these areas. The *Oceana v. Daley* lawsuit ruling set aside the revisions to EFH closures in Framework 16/39 which were meant to make consistent the EFH closures in the Scallop and Multispecies FMP20. As a result, it appears that the EFH closures in BOTH Amendment 10 and Amendment 13 apply until this discrepancy is resolved via a plan amendment, which greatly reduces access to scallops in the Georges Bank closed areas, particularly for Closed Area I. As a result, the scallop biomass that is available to the fishery is less than what had been analyzed in the biological projections (Section 5.1.1.2.1), particularly for Closed Area I and the Framework 18 area rotation TACs for Closed Area I would cause fishing mortality to exceed the 0.20 to 0.30 target for Georges Bank area access.

20 The Council adopted the EFH closures in Amendment 10 to the Atlantic Sea Scallop FMP before it adopted different boundaries based on more extensive analysis in the Multispecies FMP.



Map 9. **Comparison of Amendment 10 access area boundaries with the distribution of scallop catches in 2004.**

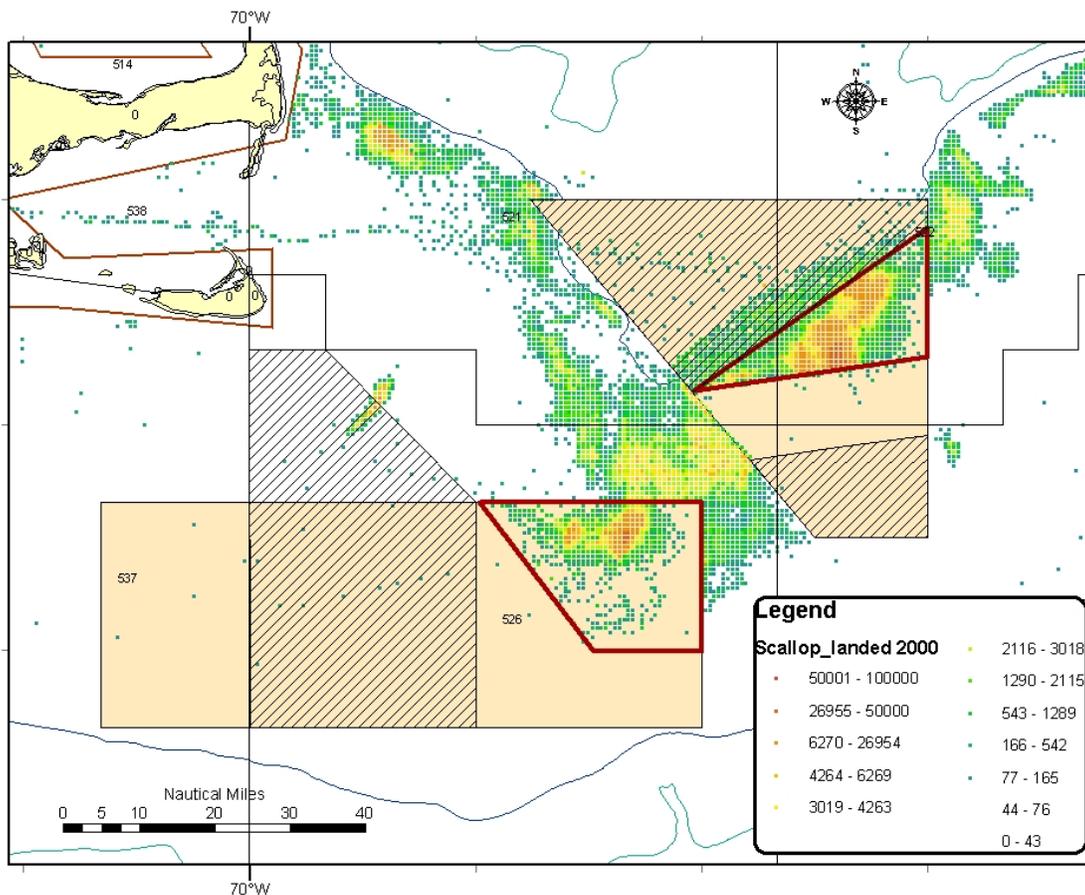
The hatched areas represent the EFH closure areas approved in Amendment 13 to the Multispecies FMP and in Framework 16/39. Inside of the Georges Bank groundfish closed areas, only the eastern third (unhatched) portion of the Nantucket Lightship Area was open to scallop fishing during 2004. Part of Closed Area II was also open, but is not shown on this map.

Reducing the available biomass without changing the proposed TACs and trip allocations will increase fishing mortality, increase area swept²¹, increase fishing time and costs, increase finfish bycatch, reduce landings per day fished, reduce scallop biomass, and reduce yield-per-recruit, particularly in Closed Area I where scallops are dense in parts that will become closed to scallop fishing due to the court order. According to the NEFSC (Dr. Hart, pers. comm.), the 2004 biomass in the part of Closed Area I that would be open to scallop fishing is about 2/3rd of the amount in the Framework 16/39 access area (8,000 mt ± 4,000 mt exploitable biomass vs. 11,904 mt within the Framework 16/39 boundary).

This section analyzes the effect of the proposed Framework 18 allocations on the new boundary restriction in Closed Area I (see Section 3.3.1.2.3) and compares it with an alternative that re-allocates the

²¹ Area swept is a measure of the cumulative towed footprint of the scallop fishery within a defined area. As area swept increases, the amount of area that is fished at least once increases and areas that are fished once would be towed over more frequently.

2006 Closed Area I trip to Closed Area II. The effects of shifting the trip to Closed Area II are also analyzed. Little effect of the court order is expected in the Nantucket Lightship Area, because most of the exploitable scallops are currently found in the northeast corner of the Nantucket Lightship Area, boundaries that were chosen and approved in Amendment 1022. During 2004, there was very little fishing effort outside of the Amendment 10 boundaries (Map 9), despite the entire eastern 1/3rd of the Nantucket Lightship Area being open to scallop fishing. In contrast, the densest areas of scallop concentrations and highest catches occurred in the southern part of the Closed Area I access area during 2000 (Map 10). More areas of highly concentrated large scallops are known to occur south of where fishing occurred in 2000. This area is being fished in 2005, but VMS data has not yet been analyzed for the ongoing 2005 fishing year.



Map 10. Comparison of Amendment 10 access area boundaries with the distribution of scallop catches in 2000.

The hatched areas represent the EFH closure areas approved in Amendment 13 to the Multispecies FMP and in Framework 16/39. During 2000, only the Framework 13 access boundaries were open to scallop fishing, which corresponded to the Nantucket Lightship Area access area in Amendment 10 and part of a different access area in Closed Area I, partially overlapping the Multispecies EFH closed area approved in Amendment 13 to the Multispecies FMP. Part of Closed Area II was also open, but is not shown on this map.

22 Amendment 10 established EFH closures that were compatible with the access area boundaries that were originally approved in Framework Adjustment 13.

Table 62 shows the maximum number of trips that full-time limited access vessels could take to each Georges Bank access area under the Framework 18 rotation alternative and under a contingency alternative that was intended to apply if the court order became effective. Trip allocations in 2007 would not be affected by the revision, but in 2006 the Closed Area I trip would be shifted to Closed Area II, which has higher total exploitable biomass and can accommodate the extra trip without exceeding the 0.20 to 0.30 fishing mortality target adopted by the Council for Georges Bank area rotation.

Compared to No Action, the Framework 18 rotation alternative and the EFH contingency alternative both increase the total number of trips in 2006 and 2007 from 5 total trips to 7 total trips. One of the extra trips is due to the higher TAC in 2006 for the Nantucket Lightship Area, partly as a result of increasing the fishing mortality target from 0.20 to 0.25. The other extra trip is due to the higher mortality target in Closed Area I (0.20 increasing to 0.30). Compared to No Action, the contingency alternative moves the extra trip out of Closed Area I and delays the one trip to 2007 (Table 62), causing mortality to decline to 0.24 if the entire Framework 16/39 access boundary was open to fishing. Instead of a two trip Closed Area II allocation in 2007 according to No Action, the contingency alternative would allocate three trips in 2006 and no trips in 2007. Thus compared to no action, the contingency alternative would increase the number of Closed Area II trips by one (resulting in a fishing mortality target of 0.30, according to the analysis below) and shift all of them to 2006, instead of 2007. As intended in the Framework 18 rotation alternative, shifting the trips into 2006 would prevent fishing during 2007 when an above average 2003 year class is expected to become vulnerable to fishing as four year old scallops and delay mortality until they are age five or older.

Table 62. Comparison of controlled access area trip allocation alternatives.

An EFH contingency alternative would transfer one 2006 trip from Closed Area I to Closed Area II, reducing the amount of scallops caught in the smaller access area within Closed Area I.

Rotation option	Georges Bank access area	2006	2007	Total
Framework 18 rotation alternative	Closed Area I	1	1	2
	Closed Area II	2	0	2
	Nantucket Lightship Area	2	1	3
EFH contingency alternative	Closed Area I	0	1	1
	Closed Area II	3	0	3
	Nantucket Lightship Area	2	1	3
No Action	Closed Area I	1	0	1
	Closed Area II	0	2	2
	Nantucket Lightship Area	1	1	2

5.1.1.2.5.1.1 Effects in Closed Area I

The exploitable scallop biomass in 2004 within the smaller Closed Area I access area was estimated to be 8,000 mt with a confidence interval ranging from 4,000 to 12,000 mt (Dr. Hart, pers. comm.). These values are comparable to 11,904 mt of exploitable biomass used for the basis of making Framework 18 biological projections (Section 5.1.1.2.1) for Closed Area I. Thus, the mean 2004 estimate for the revised area is about 2/3rd of the expected amount and unless the TAC is adjusted and different allocations are made, it would raise fishing mortality and effort in the part of Closed Area I open to scallop fishing. Another important factor to consider is that the preliminary 2005 survey biomass for the proposed Framework 18 access area was less than projected from the 2004 data, 14.8 kg/tow from the survey vs. 22.0 kg/tow in the projections. Thus not only would the lawsuit boundaries reduce the biomass of scallops available to the fishery, but also the Closed Area I biomass is less than was anticipated as well.

Biomass dynamics equations (from Ricker 1975) were used to analyze the effects of catching the same amount of scallops from a smaller part of Closed Area I having less exploitable biomass. The effect of higher mortality in 2006 from the area restriction on future exploitable biomass (B_{t+1}), mortality, catch rates, and area swept was estimated using the same methods (see equations below), accounting for fishing mortality (F), natural mortality (M), and scallop population growth (G). Catch per day was assumed to be linearly related to exploitable biomass, implicitly assuming that the catch ceases to be shucking-limited and the cull size does not change. Area swept was assumed to be linearly related to fishing mortality, i.e. constant catchability.

$$C = F * \frac{B_0 (e^{G-Z} - 1)}{G - Z}$$
$$B_{t+1} = B_t e^{G-Z}$$

Fishing mortality

If the 2004 exploitable biomass is 8,000 mt in the restricted access area, then a one trip allocation (2,617 mt TAC) would increase fishing mortality from 0.32 (26% exploitation) to 0.50 (38%) in 2006 and from 0.20 (17%) to 0.63 (45%) in 2007. At the low end of the confidence interval (4,000 mt), the fishing mortality would increase to 1.46 (74%) in 2006 and to 4.78 (97%) in 2007. The 2005 survey biomass was within the confidence interval, but below the mean estimate, if the ratio of survey to projected exploitable biomass (14.8 vs. 22.0 kg/tow) is applied to the 8,000 mt mean estimate for the restricted area. More importantly, the restricted access to exploitable biomass in Closed Area I coupled with an adjustment to be consistent with the 2005 preliminary biomass index results causes a revised biomass estimate of 5,379 mt (8000 x 14.8/22), giving a fishing mortality estimate of 0.90 (56%) in 2006 and 1.67 (78%) in 2007.

In contrast, shifting the 2006 trip to Closed Area II (Closed Area I contingency, Table 62) would reduce fishing mortality to a more sustainable level. Fishing mortality in 2006 would be zero and in 2007 would range from 0.24 (20%) to 1.19 (67%), depending on the actual amount of exploitable biomass in the restricted Amendment 10 area. At the mean estimate (8,000 mt), 2007 fishing mortality is predicted to be 0.41 (32%) which is within the sustainable fishing mortality range when averaged over the two years. Even if biomass is only 5,379 mt, the 2007 fishing mortality rate is predicted to be 0.63 (45%), which when combined with zero mortality in 2006 would have a time-averaged value of 0.32 (26%) – still close to the range of a sustainable harvest rate (see discussion below).

Thus taking two trips (5,432 mt) out of the restricted portion of Closed Area I is likely to produce fishing mortality several times greater than the target that is consistent with a sustainable catch. At the low end of the biomass estimate and one that is more consistent with the 2005 survey biomass index, it appears that the Framework 18 proposed allocation would remove nearly all of the exploitable scallops from the restricted access area. If the 2006 Closed Area I trip is shifted to Closed Area II, the scallop mortality in Closed Area I would have equal a time-averaged 0.32 (26%), very close to the range that the FMP associates with a sustainable rotation area management policy for the Georges Bank access areas.

Table 63. Estimated 2006 and 2007 Closed Area I fishing mortality at various 2004 exploitable biomass amounts, with and without (CA1 contingency) a 2006 Closed Area I trip.

			Year			
			2006		2007	
Rotation	2004 mean exploitable biomass (mt)	2004 biomass range	Target F	Recalculated F	Target F	Recalculated F
Framework 18 rotation	4,000	Low confidence interval	0.32	1.46	0.20	4.78
	5,379	Adjusted mean	0.32	0.90	0.20	1.67
	8,000	Mean	0.32	0.50	0.20	0.63
	11,904	Framework 16/39 boundary	0.32	0.30	0.20	0.31
CA1 contingency	4,000	Low confidence interval	0.32	0.00	0.20	1.19
	5,379	Adjusted mean	0.32	0.00	0.20	0.73
	8,000	Mean	0.32	0.00	0.20	0.41
	12,000	High confidence interval	0.32	0.00	0.20	0.24

Effects on biomass, daily landings, and area swept

With the Framework 16/39 boundaries (11,904 mt exploitable biomass in 2004), the projections estimated a slight decline in exploitable biomass from 9,791 mt in 2006 to 8,725 mt in 2007, increasing to 11,025 mt in 2008 when it would be closed to fishing (Table 64). Because of the advanced age of Closed Area I scallops and the relatively high biomass level, two trips from the larger access area would be sustainable if the entire access area is open to fishing. If only 8,000 mt of exploitable biomass is available in the smaller access area created by the lawsuit ruling, then the same catch (2 trips or 5,234 mt) would cause biomass to decline by a third, from 5,824 mt in 2006 to 3,862 mt in 2008. If the 2004 biomass in the smaller area was only 5,379 mt, then the proposed catch would reduce 2008 biomass to only 517 mt, nearly depleting the scallops in the accessible portion of Closed Area I.

Table 64. Projected trends in initial exploitable biomass (mt) at various assumed 2004 biomass levels within Closed Area I access area boundaries.

Exploitable biomass			Year		
Rotation	2004 mean exploitable biomass (mt)	2004 biomass range	2006	2007	2008
Framework 18 rotation	4,000	Low confidence interval	2,007	559	8
	5,379	Adjusted mean	3,267	1,599	517
	8,000	Mean	5,824	4,231	3,862
	11,904	Framework 16/39 boundary	9,791	8,725	11,025
CA1 contingency	4,000	Low confidence interval	2,007	2,415	1,266
	5,379	Adjusted mean	3,267	3,930	3,254
	8,000	Mean	5,824	7,006	7,989
	12,000	High confidence interval	9,890	11,896	16,047

Assuming the daily catch is proportional and directly related to biomass, the Framework 18 projections anticipate that LPUE would remain stable from 2,601 lbs./day in 2006 to 2,577 in 2007 (Table 65)²³. With only 8,000 mt of biomass available in the court ordered access area, the average LPUE in 2006 would decline to 2,302 lbs./day²⁴ and to 1,343 lbs./day in 2007. If however the biomass is toward the low end of the estimated range, the daily catch would average 1,920 lbs./day in 2006 and decline to only 267 lbs./day in 2007. Declining LPUE from the TAC and allocations being inconsistent with the actual biomass causes very similar conditions as those experienced by fishermen in the Hudson Canyon Area during 2005.

Table 65. Projected trends in landings per DAS (lbs./day) at various assumed 2004 biomass levels within Closed Area I access area boundaries.

Landing per DAS			Year		
Rotation	2004 mean exploitable biomass (mt)	2004 biomass range	2006	2007	2008
Framework 18 rotation	4,000	Low confidence interval	1,587	493	6
	5,379	Adjusted mean	1,920	1,049	267
	8,000	Mean	2,302	1,866	1,343
	11,904	Framework 16/39 boundary	2,601	2,586	2,577
CA1 contingency	4,000	Low confidence interval	1,587	2,130	881
	5,379	Adjusted mean	1,920	2,578	1,683
	8,000	Mean	2,302	3,090	2,778
	12,000	High confidence interval	2,606	3,498	3,720

Area swept and fishing time increases as the daily catch rate declines, and is proportional to fishing mortality. The Framework 18 projections assume that the two Closed Area I trips would be taken from an 11,994 mt biomass estimate and the total area swept estimate is 85 nm² in 2006 and 185 nm² in 2007 (Table 66). If the trips are taken from the smaller access area caused by the court order, then area swept would nearly double to 143 nm² in 2006 and 382 nm² in 2007. If the court ordered access area biomass is only 5,279 mt (the 8,000 mt mean estimate in 2004 multiplied by the ratio between predicted and observed biomass in 2005), then the analysis estimates that area swept would increase to 254 nm² in 2006 and 1,012 nm² in 2007. At the low end of the 2004 biomass estimate for the smaller area (4,000 mt), area swept in 2007 is predicted to be 2,894 nm², significantly higher than the other alternatives under consideration.

Table 66. Projected trends in area swept (nm²) at various assumed 2004 biomass levels within Closed Area I access area boundaries.

Area swept (nm)			Year	
Rotation	2004 mean exploitable biomass (mt)	2004 biomass range	2006	2007
Framework 18 rotation	4,000	Low confidence interval	414	2,894
	5,379	Adjusted mean	254	1,012
	8,000	Mean	143	382
	11,904	Framework 16/39 boundary	85	185
CA1 contingency	4,000	Low confidence interval	0	718
	5,379	Adjusted mean	0	441
	8,000	Mean	0	248
	12,000	High confidence interval	0	146

²³ According to the proposed Framework 18 schedule, Closed Area I would be closed to fishing in 2008.

²⁴ One might expect that the 2006 biomass and LPUE would be exactly the same for all biomass estimates. The analysis however assumes that fishing during the period between the 2005 and 2006 surveys occurs in the restricted area, which has an effect on 2006 biomass and LPUE averaged over the year.

Contingency alternative

Allocating one trip during 2006 and 2007 within the revised boundary of the Closed Area I access area would be sustainable. This Closed Area I effort reduction is needed to avoid causing depletion of available scallops, with corresponding reduction in catch per day, increases in fishing time, area swept, and finfish bycatch.

Assuming that 2004 biomass in the restricted area is only 8,000 mt, the single trip in 2007 (2,617 mt TAC) allocated by the contingency alternatives would let biomass to increase from 5,824 mt in 2006 to 7,989 mt in 2008 (Table 64). Even if biomass is lower than the 2004 data anticipate and the biomass was only 5,379 mt, then the one trip allocation would cause biomass to decline slightly from 3,267 mt in 2006 to 3,254 mt in 2008.

Similarly, LPUE would be about the same in 2007 (2,586 lbs./day) than it would be had a 2006 trip also been allocated and fishing allowed within the entire Framework 16/39 boundaries (2,578 lbs./day, Table 65).

Because fishing mortality would still increase to 0.41 in 2007 (assuming that the biomass in the court-ordered Closed Area I access area is 8,000 mt), total area swept (248 nm²) would actually be a little lower than had two trips been allocated (85 + 185 = 270 nm²) and the entire Framework 16/39 access area was open to fishing (see Table 66). If the biomass is only 5,279 mt in the court-ordered access area, then are swept would increase slightly to 441 nm².

5.1.1.2.5.1.2 Effects in Closed Area II

The EFH contingency alternative (Section 3.3.1.2.3) would increase the number of allocated trips for Closed Area II during 2006 from two trips to three trips. The Framework 18 rotation alternative and TAC (5,434 mt) is predicted to cause fishing mortality to equal 0.20, at the low end of the mortality target range. Increasing the number of trips allocated and scallops caught from Closed Area II would of course increase mortality, decrease LPUE, as well as increase fishing time, fishing costs, and finfish bycatch. It would also increase finfish bycatch of species that are found in greater abundance in Closed Area II than they are in Closed Area I. Catches of yellowtail flounder are however limited to the 10% TAC limit and therefore if the yellowtail flounder bycatch would otherwise increase, shifting a trip to Closed Area II might cause it to close earlier than would otherwise occur. If so, more controlled access area trips might be transferred to the open fishing areas according to the management alternative in Section 3.3.1.2.4, which in turn has its own set of implications and effects (see Section 5.1.1.2.5).

Although shifting a trip from Closed Area I to Closed Area II increases Closed Area II fishing mortality, it does not have as great an impact as it would in Closed Area I owing to the much larger amount of biomass available (31,615 mt in 2004 vs. 11,904 mt in Closed Area I or 8,000 mt in the court-ordered Closed Area I access area boundary).

Fishing mortality

Adding one controlled access area trip to the 2006 Closed Area II allocation is predicted to increase fishing mortality from 0.20 to 0.30 (

Table 67), still within the sustainable target mortality range associated with sustainability. Even though additional biomass is removed in 2006, it has a very small effect on mortality associated with a two trip allocation in 2008. Fishing mortality is predicted to increase from 0.20 to 0.21 in 2008 due to the additional catch in 2006.

Table 67. Estimated 2006 and 2008 Closed Area II fishing mortality with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007. Both alternatives would keep Closed Area II closed to scallop fishing during 2007.

		Year Data					
		2006		2007		2008	
Rotation	2004 mean exploitable biomass (mt)	Target F	Recalculated F	Target F	Recalculated F	Target F	Recalculated F
Framework 18 rotation	31,615	0.20	0.20	0.00	0.00	0.20	0.19
CA1 contingency	31,615	0.20	0.30	0.00	0.00	0.20	0.21

Effects on biomass, daily landings, and area swept

Compared to the Framework 18 rotation alternative, the additional Closed Area II trip during 2006 would cause a slight decline in 2007 biomass from 25,796 mt to 23,362 mt, with a similar decline in 2008 (Table 68). A small decline in catch per DAS is also expected and a small increase in area swept. Instead of remaining stable, the average LPUE is predicted to decline from 2,569 lbs./day in 2006 to 2,386 lbs./day in 2008 (the next year when fishing occurs; see Table 69). Area swept would increase from 92 to 139 nm² in 2006 and from 202 to 223 nm² in 2008 due to the lower predicted biomass and LPUE (Table 70).

Table 68. Projected trends in exploitable biomass within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.

Exploitable biomass		Year		
Rotation	2004 mean exploitable biomass (mt)	2006	2007	2008
Framework 18 rotation	31,615	29,326	25,796	30,395
CA1 contingency	31,615	29,326	23,362	27,526

Table 69. Projected trends in landings per DAS within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.

Landing per DAS		Year	
Rotation	2004 mean exploitable biomass (mt)	2006	2008
Framework 18 rotation	31,615	2,569	2,634
CA1 contingency	31,615	2,569	2,386

Table 70. Projected trends in area swept (nm²) within Closed Area II access area boundaries, with two (Framework 18 rotation) vs. three (CA1 contingency) allocated trips during 2007.

Area swept (nm)		Year	
Rotation	2004 mean exploitable biomass (mt)	2006	2008
Framework 18 rotation	31,615	92	202
CA1 contingency	31,615	139	223

5.1.1.2.5.1.3 Conclusion

Without shifting the Closed Area I trip to Closed Area II in 2006, the proposed allocation distribution of trips in this framework adjustment would cause effects very similar to what happened in the Hudson Canyon Area during 2005. Based on subsequent surveys, it appears that Amendment 10 overestimated 2005 biomass by 300 percent, 2.49 kg/tow in the 2005 survey vs. 6.51 kg/tow in the Amendment 10 projection. It would be likely that the catch would be unsustainable and decline to uneconomic amounts, while fishing effort, finfish bycatch, and area swept would increase.

Closed Area II could absorb the extra trip in 2006 because due to the larger amount of available biomass (31,615 vs. 8,000 mt) without causing fishing mortality to increase to unacceptable levels. An extra trip in Closed Area II during 2006 would therefore have less environmental impact than keeping the trip in Closed Area I. At the same time, the 2007 Closed Area I trip would catch a sustainable amount of scallops from the available biomass within the smaller access area caused by the court order.

Shifting the trip from Closed Area I to Closed Area II is expected to promote a more sustainable rotation area management policy in that biomass in the open part of Closed Area II would remain more stable. Closed Area II biomass would decline relative to the Framework 18 rotation alternative, but would still increase from 2006 initial biomass levels, due to the above average 2003 year class growing. LPUE would remain at more stable and sustainable levels in both areas with the re-allocation. Total area swept during 2006 and 2007 would either decline by 22 nm² or increase by 179 nm², depending on the actual biomass that is within the court-ordered access area boundary. Allocating two trip in Closed Area I would cause area swept to balloon to as much as 1,200 nm². On the other hand, moving one trip to Closed Area II is predicted to cause area swept during 2006 and 2008 to increase by only 68 nm².

5.1.1.2.5.2 Adjustments when Yellowtail Flounder catches reach 10% TAC limit

Catches of yellowtail flounder from Closed Area I, Closed Area II, and the Nantucket Lightship Area are limited to 10% of the overall TAC that applies to US fishermen. This limit would continue to apply in 2006 and 2007, but the amounts are likely to change as a result of updated assessments which are less optimistic than previous assessments ***. In addition, the Framework 18 rotation access program would increase the amount of authorized trips in 2006 and change the order of rotation. These changes make it more likely that areas could close early due to the catches of yellowtail flounder.

Four alternatives were considered to allow vessels that have not taken their trips at the time an area closes to utilize some of the effort in the open fishing areas. According to the projection's effort distribution sub-model about 62% of the fishing time would be absorbed by the Georges Bank region in 2006 and 2007 (assuming the Hudson Canyon Area is under restricted access and the Delmarva area is closed in 2007).

One alternative would allow vessels to take an equal number of unused trips in the open fishing areas, each with an 18,000 lb. limit. This alternative would decrease a potential effect of causing derby-style fishing behavior, but the total effort and scallop mortality would increase if the access areas close early to scallop fishing. Higher effort and mortality would occur because on average scallops are smaller in open fishing areas and take longer to catch.

The status quo alternative would allow vessels to fish 12 DAS each for up to two unused controlled access area trips (24 DAS total for vessels with two unused trips). In this case, a likely effect is that vessels would rush to complete at least three of the five allocated trips if it appeared that the areas would close early. Open area trips of 12 DAS would catch many more scallops than a trip of 18,000 lbs. in the controlled access area. Effort and mortality would increase not only by the ratio between the actual length of trips (about 7 days for a controlled access area trip vs. 12 DAS in the open areas), but also by the extra fishing time per DAS in the open areas. Catches on controlled access area trips are often shucking-limited and vessels fish less per DAS than they do on open area trips.

A third alternative would allocate only half the total number of trips at the beginning of the fishing year and if the yellowtail flounder catches are not approaching the TAC, the alternative would authorize the Regional Administrator to allocate the remaining trips. This approach was used in Framework 13 for area access in 2000. While the first part worked satisfactorily, it did not relieve derby-style fishing behavior that occurred when the remaining trips were allocated.

A fourth alternative (Section 3.3.1.2.4.1) would allow vessels an increase in open area DAS to compensate for lost trips when access areas close early. This increase would be calculated based on the expected differential in average scallop size and catch rates in the access areas vs. open areas. As a result, vessels would be able to fish about 6 to 7 open area DAS for each unused controlled access area trip. On average vessels would catch an equal number of exploitable scallops and scallop mortality would not increase. Total fishing effort would be less than the other alternatives, but the effects on finfish bycatch and habitat would be related to the distribution of those natural resources, relative to the location of the transferred effort.

5.1.1.2.6 Hudson Canyon Area Rotation Measures

The biological impacts of extending the Hudson Canyon Area program are interrelated to what the Council proposes for the other area rotation measures (Elephant Trunk, Delmarva etc.). It is very difficult to pull out the impacts of just this measure because it is only one part of the multitude of parameters included in the biological projections. One of the scenarios analyzed extending the Hudson Canyon program (FW18-2YrHCA restriction) and the impacts of this alternative can be compared to the status quo. Overall the landings and DAS use for the FW18-2YrHCA are higher than the status quo, but the status quo alternative includes more open area DAS (24,700), which impacts the biological projections. While the individual impacts of this measure can't be pulled out of the quantitative analyses per se, the proposed action is expected to spread effort out over time, reducing fishing mortality in 2005. Fishing mortality would be very high in the HCA in 2005 if vessels had to take all their trips in 2005. If half is deferred until 2006, optimum yield could increase and the effects of high fishing mortality would be reduced. See Section 3.3.1.3 for additional discussion of potential biological impacts.

5.1.1.2.7 Elephant Trunk Area Rotation Measures

Shifts of fishing effort to seasons when meat yield is lower increases mortality and fishing time because it takes more scallops to form 18,000 lbs. of scallop meats. This change can be amplified if effort shifts to an earlier period before seasonal growth has occurred. Another factor to consider is discard mortality, which ranges from 10% or less when air and water temperatures are moderate and the scallops are sorted quickly. Conversely discard mortality can be 50% or more when the air and water temperatures are high and the scallops sit on deck for awhile before sorting (DuPaul pers. comm.). Due to the large catches typical in controlled access areas, vessels sometimes keep a large volume of scallops on deck.

Atlantic sea scallops of equal size exhibit seasonal changes in meat weight, related to the annual reproductive cycle. Scallops also exhibit seasonal changes in growth that usually peak during the early spring when the water is clearer and food is plentiful. These seasonal cycles in growth and reproductive activity also vary with latitude, but are important determinants of mortality for a TAC regulated fishery and when recruitment to the fishing gear occurs. These factors will also affect how seasonal effort shifts affect scallop fishing mortality.

In the southern range of scallops in the Mid-Atlantic region, ETA, young scallops appear to recruit to the fishery before March (Kirkley and DuPaul 1990). The seasonal cycle in meat yield²⁵ increases from March until July, and then declines until Oct-Nov (Schmitzer 1988). All sizes of scallops ranging from 85 to 114 mm exhibited similar seasonal trends but smaller scallop meat yield declined through December (see Figure 5), but this difference may be due to the growth of smaller scallops into the size category.

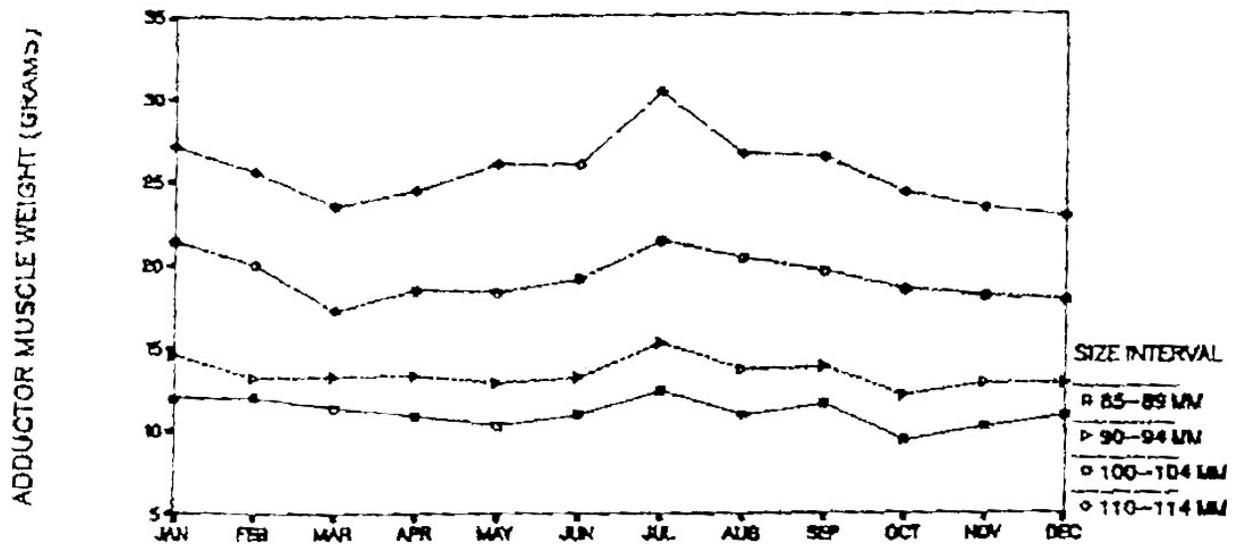


Figure 5. Seasonal trend in scallop meat yield at size (shell height) from 1988 samples taken in the Mid-Atlantic region (from Schmitzer 1990).

Although scallops are expected to be larger (about 13 count) when the ETA re-opens than were the scallops sampled in previous studies, the seasonal pattern and percent change in meat yield is expected to be similar to those observed by existing studies. Meat yields of larger scallops (e.g. 120+ mm shell height), however, are expected to be less affected by the growth of scallops of lower size because growth slows considerably as scallops age.

Impacts on scallop mortality from seasonal changes in meat yield

Seasonal ETA closures to reduce incidental encounters with sea turtles are proposed for two to five months duration. The shorter season would range from September 1 to October 31 (Section 3.3.1.4.3). In this case, vessels that would have taken trips during this period would shift them to the remaining 10 months of the fishing year. Particularly during the first year, vessels are however more likely to shift effort to the spring when recruitment occurs and catch rates are highest. During the first

²⁵ Meat yield is measured as average meat weight or inversely as the number of scallop meats required to total one pound.

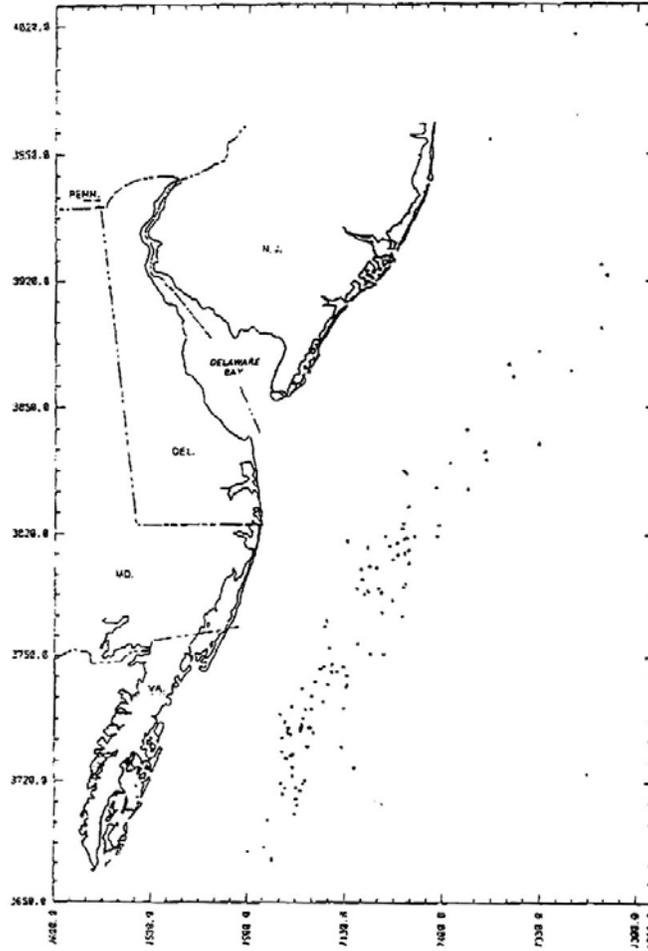
year, it is possible for vessels to shift these trips as early as January 2007 due to the early opening (3.3.1.4.2).

The average meat count during Sep-Oct is 30.2 to 30.9 for 92 mm scallops and 21.9 to 22.7 for 102 mm scallops (Table 71). Based on observed meat yield in 1988 (Schmitzer 1990), the average meat yield would be 7.4 to 10.4 percent less than if the same size scallops were taken in Sep-Oct. We cannot quantify when vessels would take the trips during the remaining season and this estimate assumes that the displaced catches are evenly distributed during the remaining 10 months. If on the other hand, the trips are taken earlier in the year, when recruitment typically occurs and catch rates are highest, the meat yield would be 5.4 to 8.8 percent lower than if the trips were taken during Sep-Oct. Just as important, the earlier trips would catch the same scallops at a smaller shell height because it would sacrifice the opportunity for scallops to grow. According to the projections, the ETA scallops are expected to grow between 9 and 14 percent annually during early 2007, after taking natural mortality into account.

Table 71. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size.

Samples were taken from the Mid-Atlantic region (Map 11), primarily in the ETA and southward to off Cape Charles, VA during 1988 (Schmitzer 1988).

	Male 92 mm	Female 92 mm	Male 102 mm	Female 102 mm
Sep-Oct	30.9	30.2	21.9	22.7
Nov-Aug	33.7	33.4	24.4	24.5
	-8.2%	-9.8%	-10.4%	-7.4%
Jan-Aug	33.2	33.1	23.9	24.0
	-6.9%	-8.8%	-8.7%	-5.4%



Map 11. Geographic distribution of 1988 meat yield samples taken by Schmitzer (1990).

During a Jun-Oct closure, the average meat yield was 30.5 to 30.8 meats per pound for 92 mm scallops and 21.6 to 22.0 meats per pound for 102 mm scallops (Table 72). If displaced effort is distributed equally during the remaining portions of the year, the meat yield would be lower and it would take about 14 to 19 percent more scallops to form 18,000 lbs. of landings. If the trips were taken before the closure, during Jan-May, the difference in meat yield is only 12 to 16 percent, but would lose up to an additional 9 to 14 percent of yield due to sacrificing the opportunity for scallops to grow during early 2007. The actual amount of sacrificed growth would be less than this, depending on how early the displaced trips are taken. Similarly, trips that are postponed until after Oct. 31 would benefit from scallop growth, but the growth rate is expected to be less in late 2007 than it was in early 2007 due to slowing growth as scallops age and due to the seasonal growth cycle which peaks in the spring.

Table 72. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size.

Samples were taken from the Mid-Atlantic region (Map 11), primarily in the ETA and southward to off Cape Charles, VA during 1988 (Schmitzer 1988).

	Male 92 mm	Female 92 mm	Male 102 mm	Female 102 mm
Jun-Oct	30.8	30.5	21.6	22.0
Nov-May	36.0	35.5	26.7	26.9
	-14.5%	-14.2%	-18.9%	-18.1%
Jan-May	34.9	34.7	25.7	25.8
	-11.7%	-12.2%	-16.0%	-14.6%

Since the proposed TAC is not adjusted for seasonal shifts in fishing effort, a lower meat yield and earlier catches would require more scallops to catch and land 18,000 lbs. or the TAC. If the crew reduces the cull size when it sorts the catch, this shift would increase scallop mortality because fewer scallops are discarded alive but not necessarily increase fishing time. If it requires more time to catch the smaller scallops, fishing time and associated environmental impacts could increase.

A June 1 to October 31 closure (Section 3.3.1.4.3.1) would have a greater impact on scallop mortality and possibly fishing time, because the closed season would encompass a period when scallop meats are highest, increasing fishing effort during other times when scallops are smaller and have lower meat yield.

Impacts on scallop mortality from changes in discard mortality

Vessels in controlled access areas typically experience very large catches in a short amount of fishing time. As a result, vessels often tow for short periods and then lay to while processing the catch. Although the largest amount of time is devoted to shucking the scallops, fishermen will sort the catches as they come aboard, stacking the retained scallops in totes or near the shucking stations, or may deckload scallops until the crew is freed up or has sufficient room to sort the catch. Also the large catches may simply take longer to sort. During this time, scallops (and other species) are subject to desiccation (which inhibits respiration) and thermal shock.

Scallop discard mortality is affected by a number of factors that are a function of how the catch is handled, something that varies from vessel to vessel. Discard mortality studies are therefore general in nature and do not apply to specific conditions. However, experienced researchers estimate that scallop discard mortality ranges from less than 10 percent in certain situations to more than 50 percent in others (DuPaul, pers. comm.). Oceanic air and water temperatures in the Mid-Atlantic typically peak in late August or early September, so all other factors being equal shifting trips out of this time frame to cooler months would help reduce scallop discard mortality.

Impacts on scallop mortality from opening the Elephant Trunk Area in January rather than March

Opening the ETA two months early on Jan. 1, 2007 would enable scallop vessels to shift trips that they might take during 2007 to January and February 2007. This shift will affect scallop mortality due to seasonal changes in meat yield and sacrificing growth caused by catching the scallops earlier.

Scallop meat yield during Mar-Aug average 13.5 for 92 mm scallops and 18.6 to 18.8 for 102 mm scallops (Table 73). Average meat yield during Jan-Aug 1988 was actually slightly higher than this period, increasing by about 1 to 2 percent. These differences are not very meaningful, however. More

important is the loss of yield due to sacrificed growth that peaks in the early spring (DuPaul pers. comm.). This loss might be as much as 10-15 percent, which means that it increases mortality and takes 10-15 percent more scallops to land 18,000 lbs. of meats. Crews can compensate for this change by reducing the cull size while sorting. It would take longer to shuck the scallops, but may not increase fishing time due to the high abundance of scallops expected to be in the ETA.

Table 73. Seasonal difference in meat count by season, shell height, and sex, derived from monthly mean meat weight for scallops of equal size. Samples were taken from the Mid-Atlantic region (Map 11), primarily in the ETA and southward to off Cape Charles, VA during 1988 (Schmitzer 1988).

	Male 92 mm	Female 92 mm	Male 102 mm	Female 102 mm
Mar-Aug	33.7	33.6	24.1	24.3
Jan-Aug	33.2	33.1	23.9	24.0
	1.3%	1.8%	0.8%	1.3%

On the other hand, intense and concentrated fishing effort can cause other problems related to the amount of shell and viscera, discarded during shucking. Although scavenging predators would literally put on the feed back, the discards in certain areas may be sufficient to overwhelm the scavengers and begin rotting on the bottom, increasing biological oxygen demand. Such events can cause additional mortality of remaining scallops and of other species on the bottom, if they cannot move to more healthy areas. These effects have not been studied and are therefore impossible to quantify, but fishermen report instances of ‘soured’ bottom where very intense fishing occurs.

5.1.1.2.8 Procedures to adjust the ETA allocations

The intent of the abbreviated adjustment process for Elephant Trunk Area trips is to respond to the uncertainty in Elephant Trunk Area biomass estimates for 2007, derived from scallop abundance at size from the 2004 R/V Albatross scallop survey. The initial 2007 ETA allocation is 5 trips based on a pre-cautionary fishing mortality target of 0.16 and an expected exploitable biomass of 77 thousand mt in 2007. According to the adjustment procedure, the initial allocation would remain fixed unless the biomass is low enough to cause Elephant Trunk Area fishing mortality to exceed 0.3226 or resource-wide fishing mortality to exceed 0.2027. However, if biomass is estimated to be higher than expected, the Council determined that additional trips should not be allocated, no upward adjustment. Fishing a controlled access area with a fishing mortality rate between 0.16 and 0.32 is appropriate and consistent with the FMP’s rotation area management procedure for a three to five year access program following a three-year closure.

Elephant Trunk Area trip adjustments to keep fishing mortality between 0.16 and 0.32

To estimate the effects of the uncertainty in the biomass estimates, iterative projections were performed to account for sampling error in the 2004 survey biomass estimates (mean = 24.3 kg/tow, standard deviation = 5.69 kg/tow). These projections gave estimates of 12,229 mt of landings in 2007 ($\pm 3,954$ mt) at $F=0.16$. The 5th percentile was 6,539 mt and the 95th percentile was 19,329 mt. The associated 2006 total exploitable biomass estimates had a mean of 55,130 \pm 15,702 mt, 32,773 mt at the 5th percentile and 84,652 at the 95th percentile.

26 $F=0.32$ is a target that the FMP considers as appropriate for a three-year controlled access program that follows a three year closure.

27 $F=0.20$ is the mortality rate associated with optimum yield for the entire scallop resource.

Derived from the final 2004 survey data, the estimated mean 2006 exploitable biomass value from the projections was 55,130 mt. The mean biomass value projected for 2005 was 43.9 kg/tow. The preliminary biomass estimate from the 2005 survey was 39.01 kg/tow, or 89% of the estimated value derived from the 2004 survey. Although within the range of sampling error, a lower value suggests a either a loss of scallops, an overestimate of the true abundance in 2004, or that scallop growth is slower than the estimated projection value. If the 2005 biomass estimate is however more accurate and holds up in 2006, the relationship between the 2005 and 2006 values in the bootstrap projections (Figure 7) suggests that 2006 exploitable biomass will be 48,900 mt, which is within the bounds where no adjustment would be needed because a five trip ETA allocation would keep mortality between 0.16 and 0.32 (Figure 6).

The relationship between 2006 biomass and the 2007 total allowable catch (TAC) at $F=0.16$ is shown in Figure 6. There is a linear relationship between these statistical estimates which was modeled as a linear function²⁸. Similarly, by calculating the initial exploitable biomass in 2007 and applying an $F=0.32$ threshold mortality²⁹, calculating a linear regression³⁰, and determining the 2006 biomass level below which the TAC (2,617 mt per trip allocated) would cause F to exceed 0.32, the exploitable biomass thresholds that would trigger a reduction in the number of trips were calculated.

Similarly, applying the linear regression for the TACs associated with various 2006 exploitable biomass levels estimated from the projections, thresholds can be calculated where the rounded number of trips achieve at least $F=0.16$ (Figure 6). Exploitable biomass in 2006 which are greater than or equal to these levels would trigger an increase in the number of Elephant Trunk Area trips that could be allocated, ensuring that ETA fishing mortality is near the intended precautionary target ($F=0.16$).

If the 2006 exploitable biomass is between 34,380 and 64,230 mt, then the five trip allocation is expected to achieve an ETA fishing mortality rate between 0.16 and 0.32. The Council adopted an initial fishing mortality target of $F=0.16$ to be precautionary and account for the uncertainty of the Elephant Trunk Area biomass projections. However if biomass is somewhat less than projected, the fishing mortality rate could increase up to a level that would be consistent with rotation area management guidelines in Amendment 10. These guidelines allow for a time-averaged fishing mortality target of 0.32 for an area that had been closed for three years and subsequently managed as a controlled access area for three more years.

28 $y = 0.094x - 0.5373$

29 $C' = F * \frac{B_0 * (e^{G-Z} - 1)}{G - Z}$, Eq. 138 and 1.40 in Ricker 1975

30 $y = 0.1741x - 0.9946$

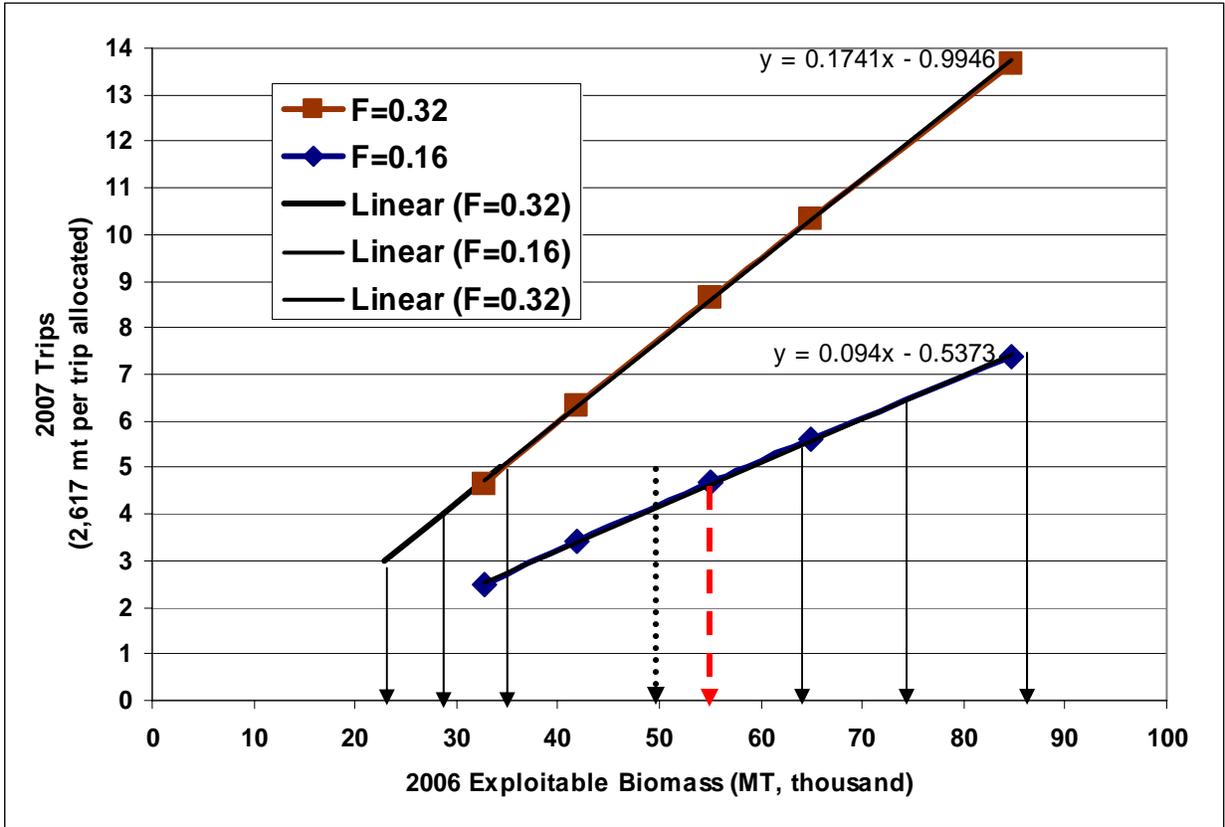


Figure 6. 2006 exploitable biomass thresholds that would trigger an adjustment in Elephant Trunk Area trips for 2007 to ensure fishing mortality is between 0.16 and 0.32.

The dashed line at 55 thousand mt represents the initial allocation in this framework based on 2004 survey data. The dashed line at 49 thousand mt represents a preliminary re-estimate based on 2005 survey total biomass index of 39.1 kg/tow.

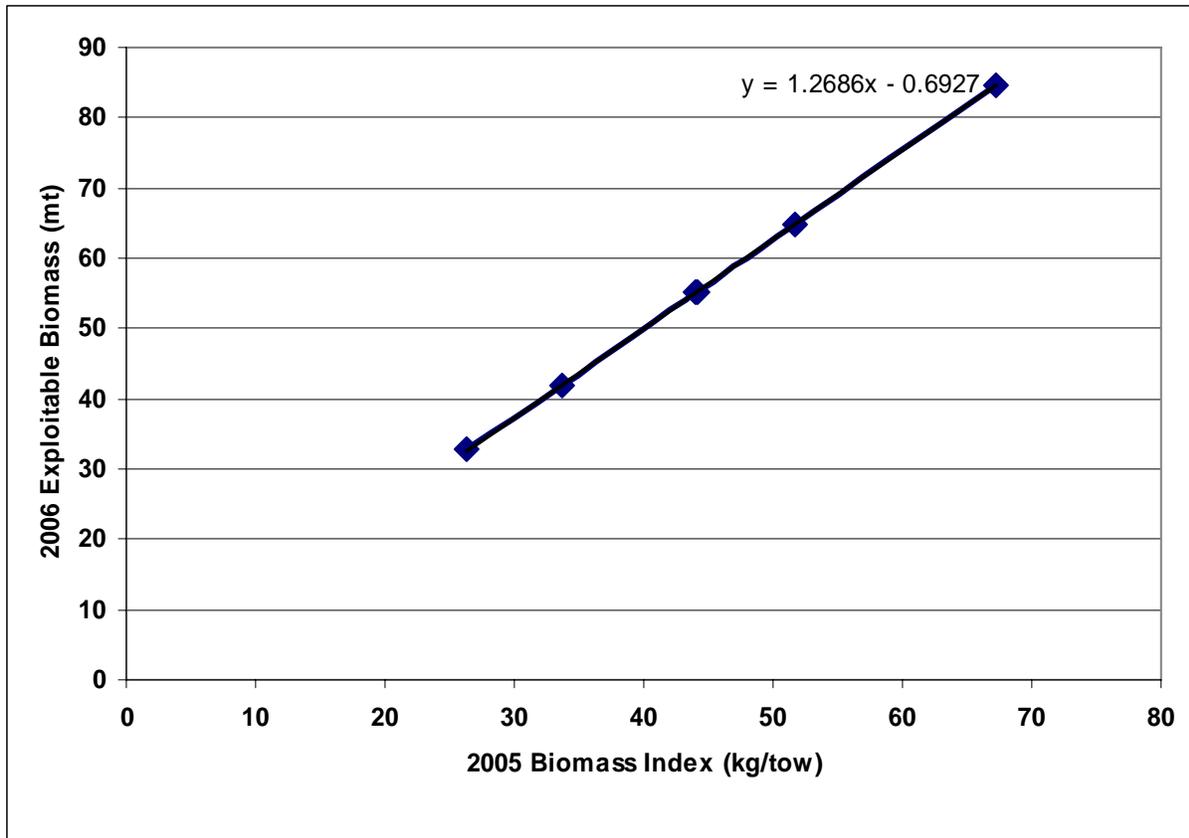


Figure 7. Projected relationship between 2005 biomass index and total exploitable biomass in 2006.

Based on these projection statistics and linear relationship between 2006 exploitable biomass and 2007 TAC, the number of Elephant Trunk Area trips should be reduced from 5 to 4 when the 2006 exploitable biomass (biomass) is less than 34,380 mt in the Elephant Trunk Area (Table 74). The number of trips should be reduced from 5 to 3 trips when the 2006 biomass is less than 28,650 mt and the number of trips should be reduced from 5 to 2 trips when the 2006 biomass is less than 22,920 mt. Based on the current estimate of scallop growth rates between 2006 and 2007, these adjustments would prevent the Elephant Trunk Area fishing mortality from exceeding 0.32.

In terms of allocations when the biomass is higher than originally estimated, the Council determined that additional access trips should not be allocated. Even if biomass is greater than 64,230 mt, the number of trips should no be adjusted upward.

Open area DAS adjustments to achieve optimum yield

Instead of increasing the number of ETA trips in response to higher than expected 2006 biomass, the adjustment mechanism could increase open area DAS by an amount that is calculated to catch the same number of scallops. Like the yellowtail flounder closure adjustment, this calculation accounts for the expected daily catch rate in open areas and the relative difference in meat count³¹. For 2007, the projection for the preferred alternative estimates that the average catch rate for open areas is 1,746 lbs./day. Dividing the average LPUE into the 2,617 mt for each trip that could be allotted in the ETA

31 This conversion is needed because fishing mortality is a numbers-based parameter, not weight based. Landings of an equivalent amount of scallop weight from access areas where scallops are larger kills fewer scallops than landing the same weight of scallops in open areas.

allows for an allocation of 3,305 open area DAS. But the expected average meat count in the ETA is 13.04 meats per pound vs. 17.15 meats per pound in the open areas. Therefore, to land the same amount of scallops from the open areas requires fewer landings and less time, which is the ratio between these average meat count estimates. Thus, the fleet would land the same number of scallops, achieving the same overall fishing mortality rate, in only 2,413 days. There were an equivalent of 304.55 full-time vessels using DAS in 2004, which means that for each 2,617 of ETA TAC to be allocated, each full-time vessel could receive 7.92 DAS to fish in the open areas without increasing mortality above the optimum yield level. In terms of number of scallops caught and rounding up to the nearest whole number of open area DAS, an increase of 8 DAS is equivalent to an allocation of an additional Elephant Trunk Area trip (Table 74).

Even though an 8 DAS open area allocation is expected to land the same number of scallops as a one-trip Elephant Trunk Area allocation, it will take considerably less towing time per DAS to catch the scallops in the Elephant Trunk Area. Due to the high biomass, the projections estimate that it will take about ½ hour of fishing time per day to catch the scallops that can be shucked by a seven person crew. In the open areas, the projections estimate that it will take about 10 ½ hours. Thus an open area DAS allocation that allows the fleet to catch an equivalent number of scallops from open fishing areas increases towing time considerable. This would have an adverse impact on effects that are correlated with total fishing time, such as finfish bycatch, habitat impacts, and fishing costs.

Table 74. Adjustment of Elephant Trunk Area trips to keep fishing mortality between 0.16 and 0.32 over a range of 2006 total exploitable biomass values.

Reason for adjustment	2006 exploitable biomass threshold (mt, thousand)	Adjusted number of trips	Number of equivalent open area DAS
Biomass low enough to cause F to exceed 0.32 with more trips	22.92	2	-24
	28.65	3	-16
	34.38	4	-8
Initial allocation		5	0
Biomass high enough to cause F to be below 0.16 with fewer trips	64.23	6	8
	74.86	7	16
	85.50	8	24

Effect on overfishing

The overall fishing mortality target associated with optimum yield for the preferred alternative is 0.172, which leaves a considerable amount of catch that could take place without causing overfishing to occur. Based on the following analysis of the projections using 2004 survey data, an increase of ETA fishing mortality up to F=0.32 is not expected to cause mortality to exceed the overfishing definition threshold.

If the number of Elephant Trunk Area scallops at an F=0.32 target from the status quo projection scenario is substituted in the scenario for the preferred alternative, 1462 million scallops would be caught. Using a least squares trend line drawn through the projection results (Figure 8), the expected fishing mortality if the ETA TAC is equivalent to 0.32 at currently projected biomass is 0.215, less than the overfishing definition threshold value (F=0.24). The actual value, however, will depend on the distribution of scallop fishing effort and the effects of the 2005 and 2006 fisheries on biomass in 2007. There are a considerable number of factors that could change this assessment, including but not limited to the scallop size selection by the fishery and the distribution of fishing effort in the open areas.

Table 75. Projected fishing mortality vs. number of scallops landed by rotation area management alternative.

The adjusted preferred alternative assumes that the ETA would be harvested at $F=0.32$ at currently projected biomass levels.

Rotation area management alternative	Estimated 2007 overall fishing mortality	Number of scallops landed (millions)	Landings (million pounds)
No action	0.18	1058	82.4
Status quo	0.20	1227	90.2
Framework 18 - 30K open DAS	0.20	1266	80.2
Framework 18 - 20K open DAS 2006	0.20	1312	85.0
Framework 18 - 15K open DAS	0.20	1353	88.4
DMV closure - 20K open DAS (preferred alternative)	0.172	1165	78.0
FW 18: 2Yr HCA restriction	0.20	1353	87.4
DMV closure - Scenario 1	0.20	1373	88.3
Fw 18 rotation - 24.7K DAS	0.20	1293	82.8
DMV closure - 18K open DAS	0.16	1114	75.7
FW18: 1YR HCA restriction	0.20	1309	85.1
Framework 18 - 20k open DAS 2006-07	0.19	1233	81.0
Recalculated			
Preferred alternative w ETA F=0.32	0.215	1462	Depends on ETA biomass

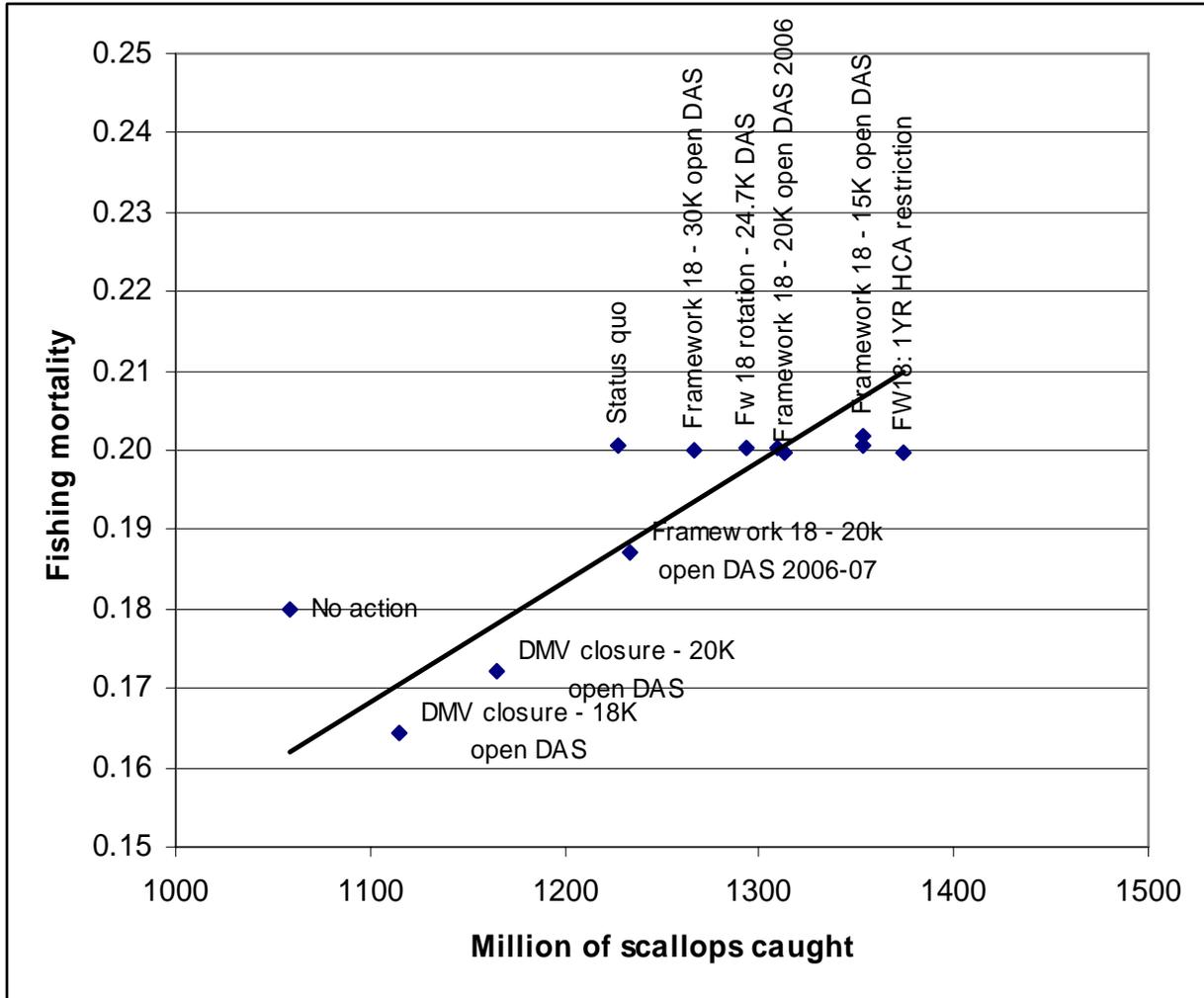


Figure 8. Estimated fishing mortality in 2007 vs. number of scallops landed for various rotation area management alternatives

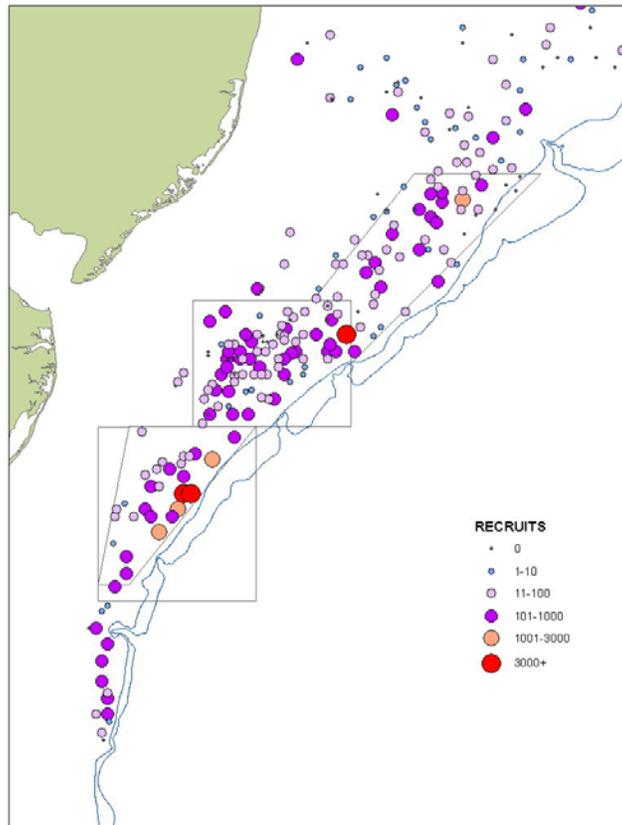
5.1.1.2.9 Delmarva Area Rotation Closure

5.1.1.2.9.1 Distribution of scallop recruitment in 2005

Amendment 10 ushered in area rotation and set some guidelines for closing areas to delay mortality on abundant, young scallops. When closed areas re-open to fishing under controlled access rules, the results generally increase total yield, improve net benefits by raising revenue and lowering fishing costs, and reducing total fishing time to catch the scallops associated with optimum yield. Reducing fishing time tends to improve conservation by reducing finfish bycatch, reducing habitat effects, and reducing potential interactions with turtles in areas where turtles occur.

The 2004 survey data suggested no new areas where high abundances of small scallops occurred, but a new area off of Maryland (south of the Elephant Trunk Area) was identified in the 2005 survey data as being one such candidate for scallop area rotation. Many of the tows in this area had from 500 to 3000 scallops per tow of two year old scallops. These scallops would become vulnerable to capture,

particularly with scallop dredges, as four year olds in 2007. A map showing the distribution of scallop ‘recruits³²’ is shown in the following map.



Map 12. Distribution of scallops smaller than 70 mm in the 2005 R/V Albatross scallop survey. Areas shown, from north to south, include the Hudson Canyon Area, the Elephant Trunk Area, and proposed the proposed DMV Area closure.

5.1.1.2.9.2 Updated Delmarva Area Biological projections

Standard projections for Framework 18 (Section 5.1.1.2.1) using the latest available data from the 2004 scallop survey underestimate the benefits of a new Delmarva Area (DMV closure – 20K open DAS) closure because the main benefit will be from the above average recruitment observed in the 2005 survey data. While the 2005 survey data has not yet been finalized, preliminary data show a significant benefit in terms of higher sustainable yield with fewer environmental effects. Survey data for the entire resource is not available for 2005, but comparison of the DMV Area projections using preliminary data are informative and provide a better estimate of area rotation benefits than do the standard projections.

Three projection scenarios are compared below to demonstrate the benefits of DMV Area rotation and compare them to the estimates in the standard Framework 18 projections that rely on the final 2004 survey data. The new preliminary projections are labeled as ‘DMV open (or closed) – 20k open area DAS’. An allocation of 20,000 open area DAS are assumed, because the amount of open area DAS has an effect on effort in the DMV Area if it is not closed to fishing in 2007. For comparison, these results

³² Scallop recruits are customarily less than 70 mm shell height.

are shown next to the standard projection results for the DMV Area (‘Delmarva Area closure – 20k open area DAS), also assuming an open area DAS allocation of 20,000 open area DAS.

Using the new (but preliminary) data, the biological projections indicate that initiating area rotation with a DMV Area closure would:

- Boost landings by 15% to 48.6 million lbs. during 2007 to 2014.
- Increase the landings of more valuable larger scallops (less than 10 meats per pound) by 180%, averaging 2.7 million lbs. per year.
- Decrease area swept (having a similar reduction of impacts on finfish bycatch, turtle interactions, and habitat) from an average 250 nm² per year to 170 nm² per year. This benefit is however mitigated by an increase in fishing time elsewhere, of approximately 71 nm² per year during 2007 to 2014.

The new recruitment and total biomass in the DMV area are estimated to be about 7.5 kg/tow, instead of the 3.6 kg/tow previously estimated using 2004 survey results. Mostly, the added biomass is from age 2 scallops that are not vulnerable to fishing. Similar differences in total biomass are expected in 2006, compared to the standard biological projections.

With a three-year closure, beginning in 2007, total biomass is expected to increase to about 21 kg/tow by 2009 before the DMV Area would re-open in 2010 as a controlled access area. The standard projection using 2004 data estimated total biomass of only 13 kg/tow.

If the DMV Area remains open to fishing, the projections using preliminary 2005 data suggest that the increasing biomass would attract considerably more effort in 2007, 5214 DAS vs. 1808 DAS for the standard projections, due to the new estimates of higher biomass. As a result, the preliminary 2005 projections show that total biomass would decline in 2007 and 2008 to a low of 7.6 kg/tow and never exceed 10 kg/tow.

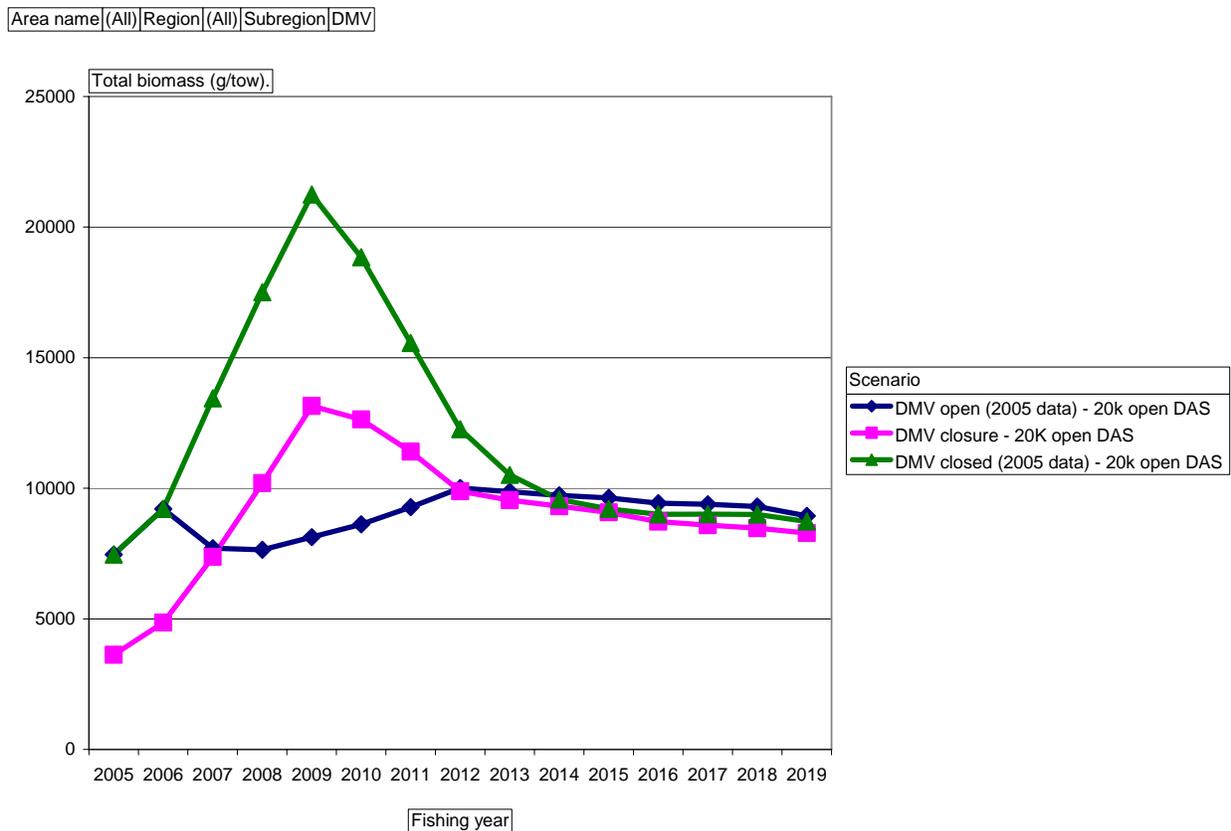


Figure 9. Comparison between Delmarva Area projections for total survey biomass (g/tow).

The differences in exploitable biomass with DMV Area rotation are even more striking than for total biomass. The preliminary 2005 projections show exploitable biomass³³ increasing in 2009 to 17,400 mt vs. 5,700 mt without a closure. Thus the 2005 recruitment contributes to an increase of about 75% compared to the standard projection of 10,800 mt when only the 2004 data were used to project scallop biomass.

If the DMV Area remains open to fishing, the preliminary projections suggest that exploitable biomass would level off around 5,000 mt and then increase gradually through 2012.

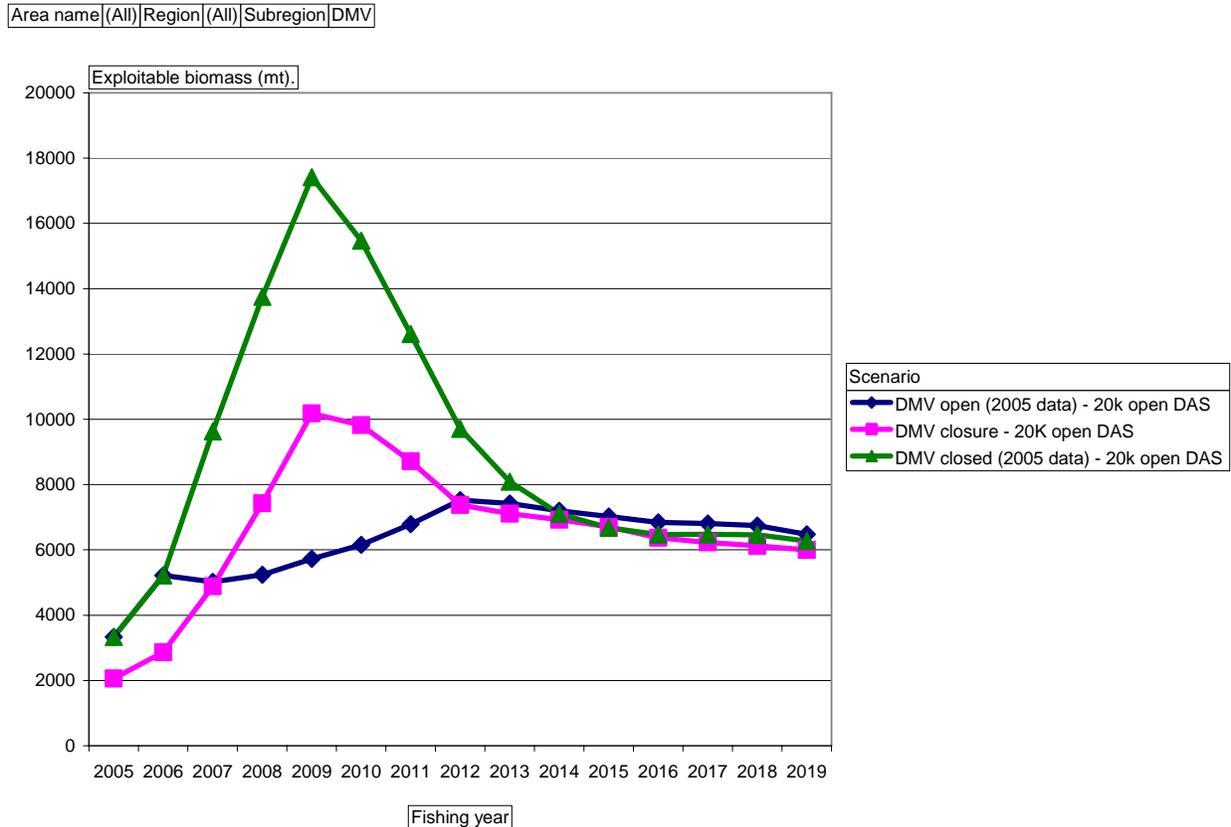


Figure 10. Comparison between Delmarva Area projections for exploitable biomass (mt).

³³ Swept area biomass is estimated in total metric tons for surveyed strata in the DMV Area, by applying a 50% dredge efficiency ratio determined from gear studies on depletion rates for the Mid-Atlantic region.

Catches in the DMV Area without closure are expected to increase from 5 million pounds in 2006 to 10 million pounds in 2007, before dropping rapidly to less than 6 million pounds in 2008, followed by a slower decline to less than 4 million pounds. In contrast, with a three year closure followed by a ‘standard’ controlled access program, catches in 2010 to 2012 are projected to be between 11 and 12 million pounds, followed by higher amounts (compared to no closure) until 2015. The standard projections using 2004 data formerly estimated that yield would only range between 7 and 8 million pounds in 2010 to 2012.

Over the period from 2007 to 2014, the total landings from area rotation are expected to be 15% higher than without area rotation (48.6 vs. 42.2 million lbs.).

Area name (All) | Region (All) | Subregion | DMV

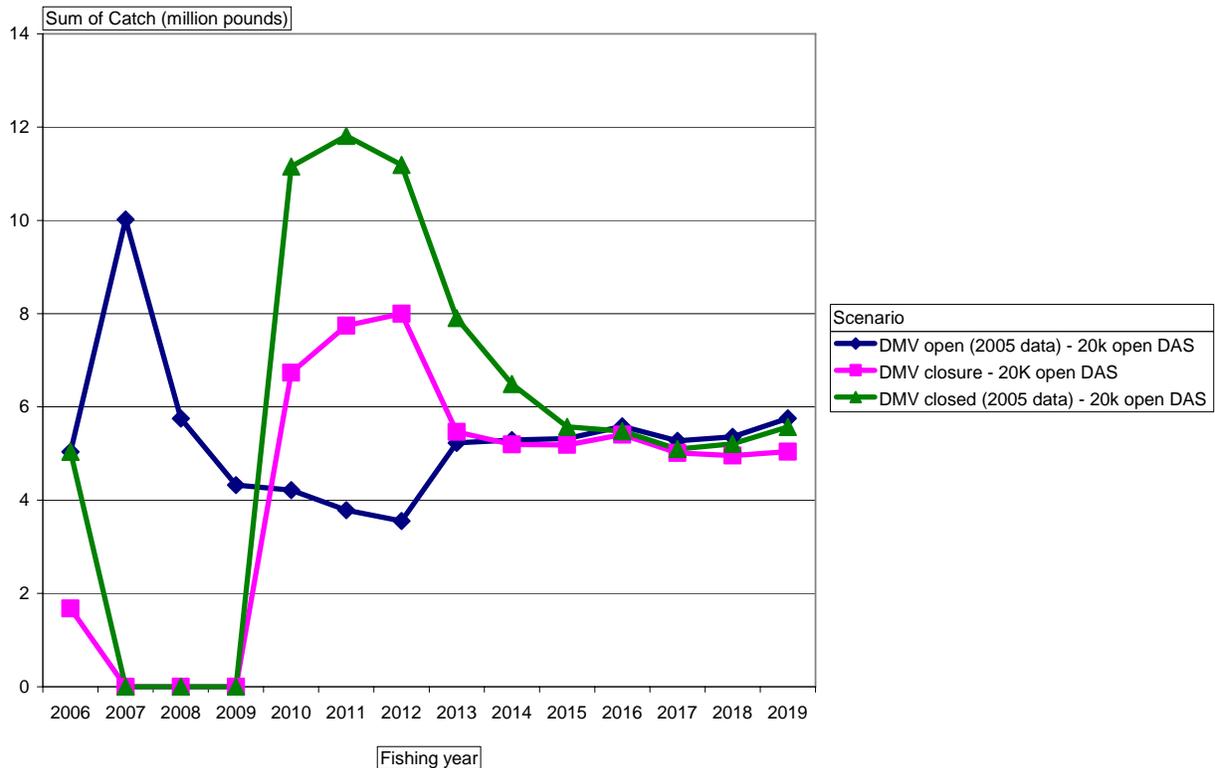


Figure 11. Comparison between Delmarva Area projections for landings (million pounds). Landings for rotation management (DMV closed 2005 data) are 15% higher in 2007 to 2014 compared to keeping the DMV area open to fishing.

As a result of area rotation, landed scallops are expected to be of much larger size, which often carry a premium price. During 2010 to 2012, the landings of less than 10 count scallops (U10) would be 180% higher than without area rotation. Similar increases in 10/20 count scallops are projected, particularly in 2010. Over the seven years from 2007 to 2014, U10 scallops are expected to average 2.7 million lbs. per year with area rotation and only 1 million lbs. per year without.

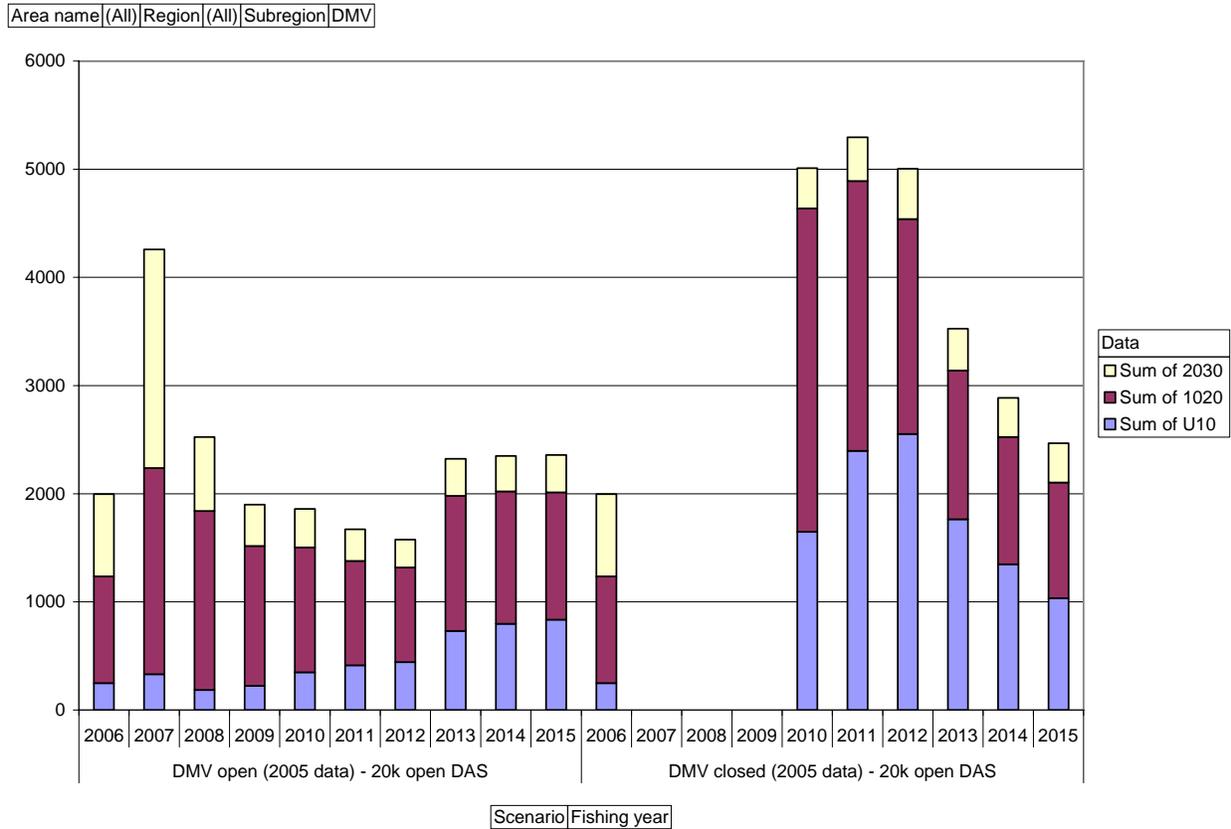


Figure 12. Comparison between Delmarva Area projections for landings (million pounds) by size category. Landings of U10 scallops for rotation management (DMV closed 2005 data) are 180% higher in 2007 to 2014 compared to keeping the DMV area open to fishing.

Likewise, average catches measured as landings per DAS used are expected to increase from almost 1,800 lbs./day in 2006 whether or not there is a closure due to the effects of the strong 2005 scallop recruitment. Without a closure (DMV open), the average catch rate is expected to gradually increase to 2,250 lbs./day, due primarily to the above average 2003 year class (observed in 2005). In contrast, LPUE with a closure would climb more rapidly and to higher levels, 2,500 lbs./day when the area is expected to re-open as a controlled access area. Some of this increase results simply from relieving fishing pressure on scallops that were already present in 2004, when the standard projections indicated that the average LPUE would climb from a DMV Area closure to 2,300 lbs./day.

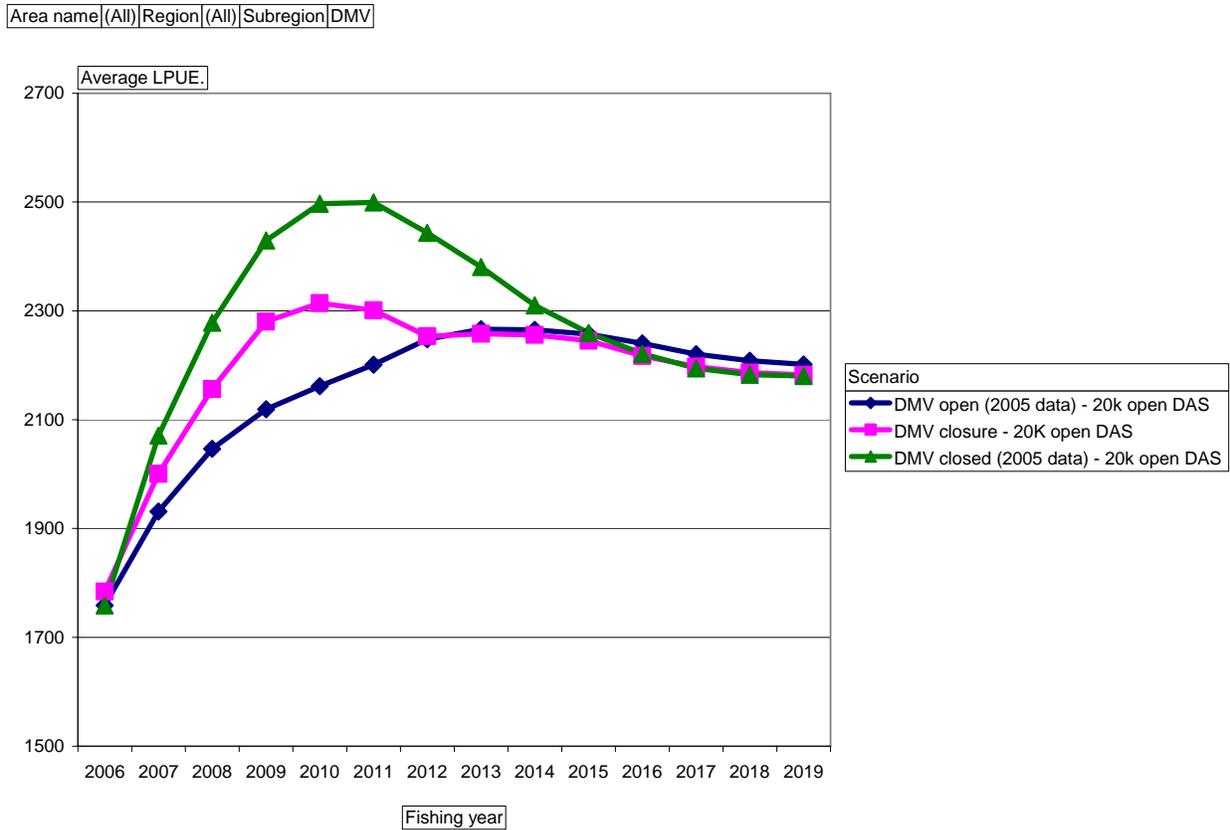


Figure 13. Comparison between Delmarva Area projections for average landings per DAS.

Following the pattern of DAS use and landings, total area swept³⁴ is expected to spike in 2007 without a closure as the fleet would target the 2003 year class as four-year olds in 2007. This peak would be followed by a gradual decline in fishing effort and area swept through 2012, according to the projection model results.

In comparison, a three year closure and area rotation management would keep total area swept between 200 and 320 nm² per year. Over an eight year period from 2007 to 2014, the rotation area management of the Delmarva Area would reduce average area swept from 250 nm² per year without a closure to 170 nm² per year with closure and subsequent controlled access.

³⁴ Total area swept accounts for total DAS fished and the amount of fishing time per DAS, constrained by the crew's shucking capacity.

Area name (All) Region (All) Subregion DMV

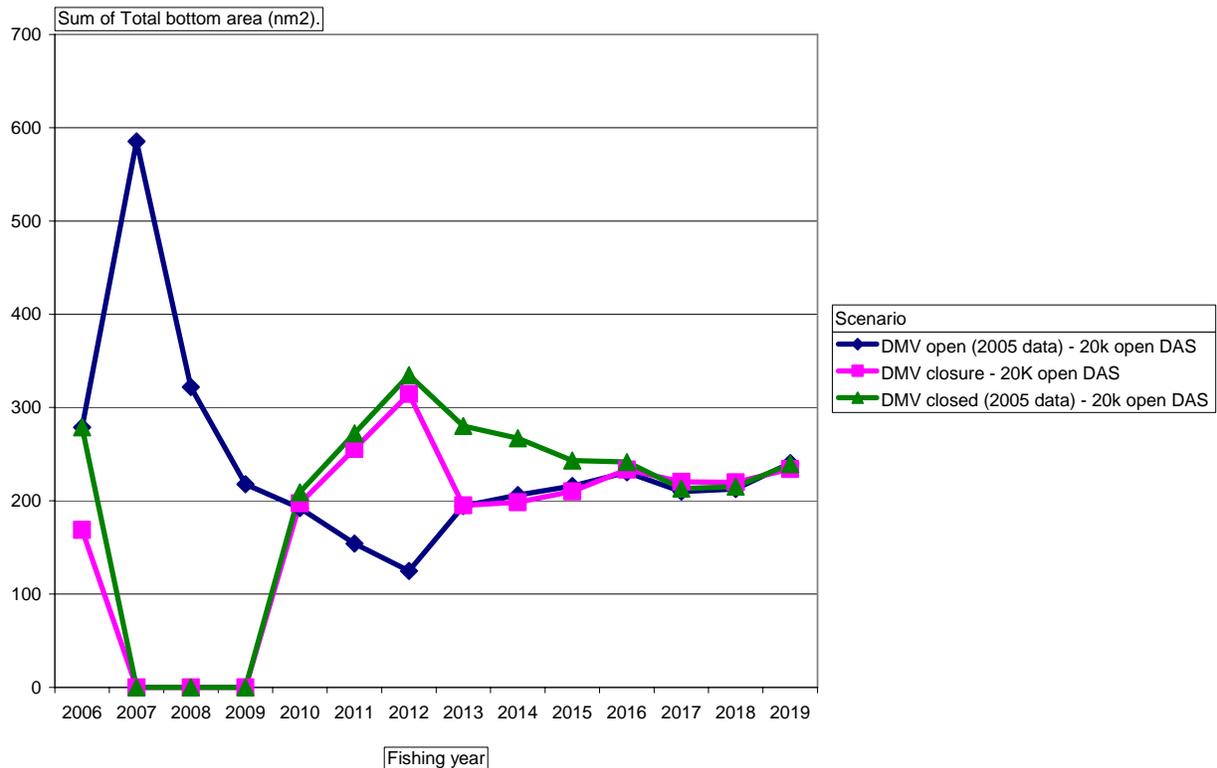


Figure 14. Comparison between Delmarva Area projections for total area swept (nm²). Total area swept is 32% less for DMV area rotation than keeping the area open to fishing during 2007 to 2014 (170 nm² per year vs. 250 nm² per year).

This benefit in terms of reduced fishing time would of course be partially offset by increases in area swept elsewhere during the 2007-2009 closure period. For comparison, two similar standard projections, one with a DMV Area closure ('DMV closure – 20k open area DAS') and one without ('Framework 18 – 20k open area DAS'), show an average 71 nm² difference in total area swept per year during 2007 to 2014 (see table below), including the years when the DMV Area would be closed and managed as a controlled access area.

Table 76. Total projected area swept for two comparative standard projections (one without a DMV Area closure and one with a 2007-2009 closure followed by a three year management program as a controlled access area.)

Average of Total bottom area (nm ²) Fishing year	Scenario	
	Framework 18 - 20K open DAS 2006	DMV closure - 20K open DAS
2007	5,365	5,018
2008	3,378	3,010
2009	2,719	2,938
2010	2,550	2,509
2011	2,447	2,481
2012	2,479	2,530
2013	3,042	2,976
2014	3,194	3,149
Grand Total	3,147	3,076

5.1.1.2.9.3 *Exploitable biomass distribution*

During the 2006 fishing year, the Framework 18 rotation alternatives would classify portions of Closed Area I, Closed Area II, and the Nantucket Lightship Area as access areas where scallop fishing could occur up to a TAC equivalent to a fishing mortality target range between 0.2 and 0.3. In addition, the Hudson Canyon Area controlled access area would continue without an additional allocation to allow vessels to delay taking the remaining 2005 trips. The Elephant Trunk Area would remain closed to scallop fishing to protect small scallops, but the Delmarva Area would remain open because most of the 2003 year class will not have grown to a size to be vulnerable to capture by dredges, and to a lesser extent scallop trawls.

The proportion of exploitable scallop biomass by area is shown in the table below, for comparison with Amendment 10 area rotation guidelines. According to the guidelines approved by the Council in Amendment 10 (NEFMC 2004), “there will be one and no more than one scallop rotational closure in each region at any time, except for the Gulf of Maine region.” They go on to say that, “Areas indefinitely closed to scalloping (to minimize bycatch or habitat impacts, or for other reasons) will not be considered ‘rotational closures’ for this purpose.”

The Amendment 10 area rotation guidelines also provide guidance as to the maximum closure extent, which says, “Closures in each of the five regions may not close any more than 25% of the exploitable scallop biomass when new closures are considered. In no case will areas be closed under this rotation system if doing so would result in the total area closed to scalloping (including all closed areas, not simply rotational closures) exceeding 50% of the productive blocks in the region.”

The final implementation of Amendment 10 did not further define or identify ‘productive blocks’, but each block was intended to be one ten-minute square, of approximately 75 nm². Framework 18 alternatives can, however, be evaluated in terms of the amount of exploitable biomass in each type of area.

By 2006, the projections estimate that the exploitable biomass (herein “biomass”) will have grown to 73% of the biomass in the Mid-Atlantic region (see table below). Technically the HCA would not be closed, except to vessels that had not deferred trips to 2006 or 2007. If the HCA is considered ‘closed’, then the total biomass in closed areas during 2006 is estimated to be 84% with the remainder in open fishing areas (there are no ‘access’ areas, except for the partially closed HCA proposed for 2006).

For the Georges Bank region, 28% of biomass is estimated to be in the CA 2 access area and 21% in the NLSA access area. Totaling up the areas, 57% of the biomass is estimated to be in access areas, 17% in open areas, and the remainder in closed areas. In 2006, there are no closed rotation areas in the Georges Bank region.

Thus, although additional rotational closures might be considered in the Georges Bank region, the existing biomass in closed areas might make rotation difficult in 2007 under Amendment 10 policy. Also, additional closures in the Mid-Atlantic region during 2006 would be considered by Amendment 10 as being inappropriate due to the extensive amount of biomass in the closed ETA.

Table 77. **Distribution of 2006 exploitable biomass by area and management status.**

The Hudson Canyon Area is considered ‘closed’, but would be open to fishing using 2005 allocated trips that had not been taken in 2005.

Exploitable biomass (mt).		Region		
Area name	Status	GB	MA	Grand Total
Closed Area I access	Access	9%	0%	4%
Closed Area I closed	Closed	7%	0%	3%
Closed Area II access	Access	28%	0%	14%
Closed Area II closed	Closed	9%	0%	4%
Delmarva	Open	0%	3%	1%
Elephant Trunk Area	Closed	0%	73%	36%
Hudson Canyon Area	Closed	0%	11%	5%
Long Island	Open	0%	10%	5%
Nantucket Lightship Area access	Access	21%	0%	10%
Nantucket Lightship Area closed	Closed	10%	0%	5%
New York Bight South	Open	0%	3%	1%
Northeast Part	Open	3%	0%	1%
South Channel	Open	9%	0%	5%
Southeast Part	Open	5%	0%	3%
Virginia Beach	Open	0%	0%	0%

Totals	GB	MA	All
Access	57%	0%	29%
Open	17%	16%	17%
Closed	26%	84%	54%

According to the Framework 18 area rotation alternatives, the ETA would be open to fishing as a controlled access area and the HCA would be open to fishing using unused 2005 trips. The Status quo and No Action alternatives would allow the ETA to re-open as a fully-open fishing area, not under controlled access area rules. In any case, the biomass in the ETA would no longer be classified as a ‘closed area’.

The projections estimate that the proportion of biomass in the ETA will have fallen (or remained relatively constant) to 71% of the biomass in the Mid-Atlantic region (see table below). This figure is a bit of an overestimate, because the standard projections begin with 2004 survey data which does not account for the 2003 Delmarva Area year class that the survey measured in 2005. The partially closed HCA is estimated to have 12% of the biomass and the Delmarva Area (if closed) would have 4%. Based on the analysis of the 2005 data above, the Delmarva Area biomass is estimated to be almost double the amount estimated in the standard projections using 2004 data. Therefore, the biomass in the DMV Area might be as much as 8% of the total Mid-Atlantic biomass.

For the Georges Bank region, CA 2 would be closed as a rotation area to protect the 2003 year class observed by the survey in 2004 and 2005. The projections estimate that 31% of the biomass would be in the CA 2 area. Added to the biomass in permanently closed areas, the total biomass in all closed areas is estimated to be 59% of the total Georges Bank region biomass in 2007. This figure is estimated to drop to 39% in 2008 as CA 2 re-opens to fishing under controlled access area rules and CA 1 closes, according to the revised rotation order.

Thus, rotational closures in the Mid-Atlantic region would at most account for 17% of the total exploitable biomass, well below the Amendment 10 guidelines even if the HCA is considered closed to fishing. It appears that a DMV Area closure would therefore be compliant with the Amendment 10 rotational management guidelines. Additional closures in the Georges Bank region, however, would be unsuitable in 2007 according to the rotational management guidelines.

Table 78. **Distribution of 2007 exploitable biomass by area and management status.**

The Hudson Canyon Area is considered ‘closed’, but would be open to fishing using 2005 allocated trips that had not been taken in 2005 or 2006.

Exploitable biomass (mt).		Region		
Area name	Status	GB	MA	Grand Total
Closed Area I access	Access	9%	0%	4%
Closed Area I closed	Closed	8%	0%	4%
Closed Area II access	Closed	31%	0%	15%
Closed Area II closed	Closed	10%	0%	5%
Delmarva	Closed	0%	4%	2%
Elephant Trunk Area	Access	0%	71%	36%
Hudson Canyon Area	Closed	0%	12%	6%
Long Island	Open	0%	9%	5%
Nantucket Lightship Area access	Access	18%	0%	9%
Nantucket Lightship Area closed	Closed	10%	0%	5%
New York Bight South	Open	0%	3%	2%
Northeast Part	Open	3%	0%	1%
South Channel	Open	7%	0%	3%
Southeast Part	Open	4%	0%	2%
Virginia Beach	Open	0%	1%	0%

Totals	GB	MA	All
Access	27%	71%	49%
Open	14%	13%	13%
Closed	59%	17%	37%

5.1.1.2.9.4 *Effects of a Delmarva Area closure on fishing activity*

Any type of area-based management in fisheries has effects on fisheries that vary according to location. During a closure, the vessels that are typically affected the most are vessels fishing from ports near the closure area. When an area re-opens to fishing, on the other hand, these vessels are also the ones that tend to benefit the most.

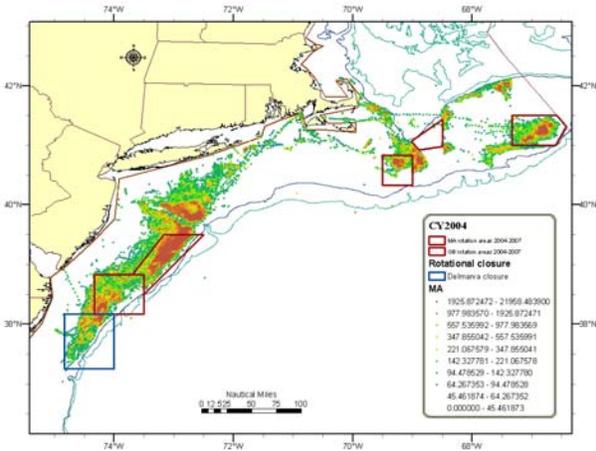
Historically, the limited access scallop fishery has been prosecuted by a large-boat fleet capable of staying at sea for two to three weeks and going long distances in search of scallops. Many Mid-Atlantic vessels were known to fish on Georges Bank during the early 1990s when a strong year class appeared in the Great South Channel, southeast of Cape Cod, MA. In contrast, many New Bedford, MA vessels and even some as far away as Maine have recently fished in the Mid-Atlantic region where open area catches were more favorable. There are, however, other vessels that remain fishing in their region at all times, either due to vessel capabilities, economics, or social custom.

To examine the distribution of fishing vessels that could be affected by a potential Delmarva Area closure, the 2004 VMS and VTR data were examined with respect to the state where vessels landed catch. Of particular interest is the Hudson Canyon Area [which would be open in 2007 only for taking unused 2005 trips (Section 3.3.1.3.1), and open to fishing in 2008 and 2009], the Elephant Trunk Area (which would be open for controlled access area trips in 2007-2009), and the Delmarva Area (proposed for closure during 2007-2009). Since vessels cannot trade open area DAS, the vessels that would be most impacted are those that would be unable to fish in other open fishing areas of Georges Bank or the northern part of the Mid-Atlantic region.

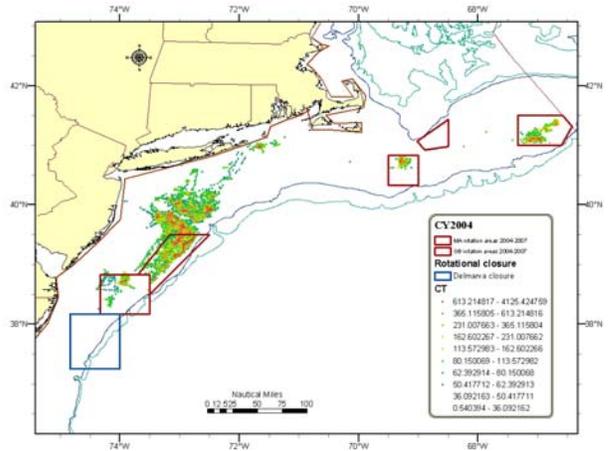
If a significant number of vessels are unable to fish other areas (e.g. from VA and NC), they would tend to fish in the remaining portions of the Mid-Atlantic region near their port of origin and deplete scallops quicker than the projections might otherwise indicate. On the other hand, some vessels that can fish further north (e.g. from NJ and MA) might do so, relieving fishing effort to the south in open fishing areas.

The charts in Map 13 show the distribution of 2004 scallop catches by state where the catch was landed. During 2004, the HCA was open for controlled access trips, the ETA was open from January to July, and the proposed DMV Area was open to fishing. In the open areas, NC vessels fished almost exclusively in what Framework 18 will classify as a controlled access area or closed area. A couple of vessels apparently took some controlled access area trips in Closed Area II during 2004. There are more limited access vessels landing scallops in VA and the distribution of effort spreads a little further north, but not as far north as the scallop beds inshore of the HCA and offshore of central and northern NJ. Again it appears that a couple of vessels took trips to the Nantucket Lightship Area and Closed Area II.

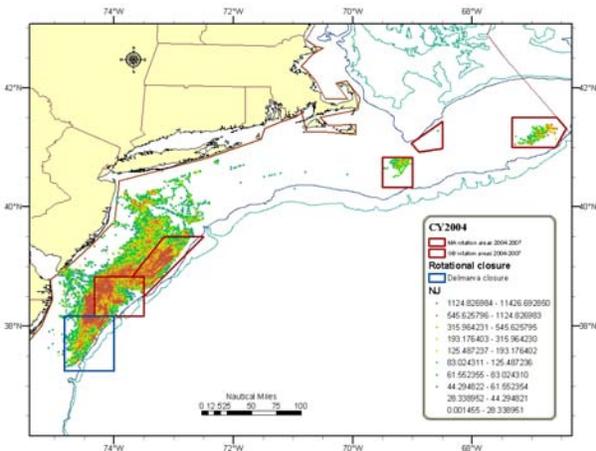
Vessels landing scallops in MA



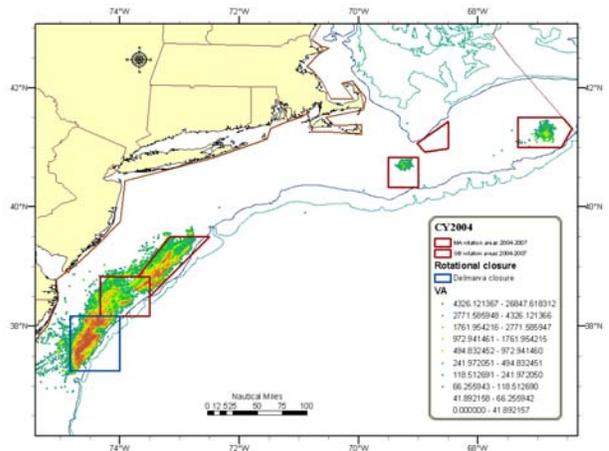
Vessels landing scallops in CT



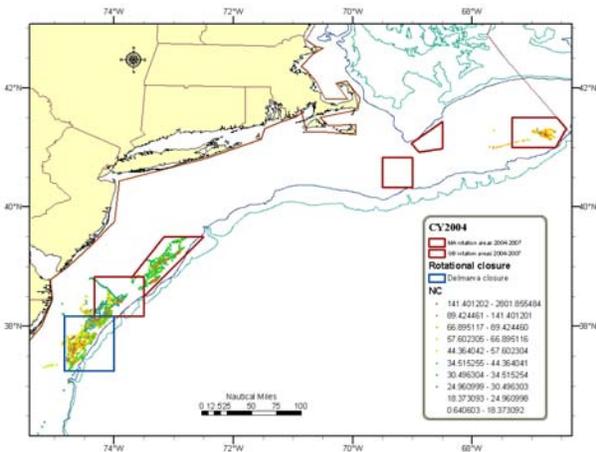
Vessels landing scallops in NJ



Vessels landing scallops in VA



Vessels landing scallops in NC



Map 13. Distribution of 2004 scallop catches by state of landing.

During 2007, vessels would receive a five trip ETA allocation, plus two Georges Bank area trips which may be traded. Thus vessels in the Mid-Atlantic could fish up to seven ETA trips (after potential trades), or 84 DAS. This allocation should be compared with a 2004 allocation of 91 DAS to fish in the Georges Bank access areas (2 trips), the HCA (3 trips), and open areas (40 DAS). Vessels are also likely to fish open area DAS north of the DMV Area and west of the ETA, or move a little further north to fish the NY Bight area, inshore of the HCA off central and northern NJ. Mid-Atlantic vessels that are capable of doing so might also trade ETA trips for more Georges Bank area trips to fish most of the year in the Georges Bank region, probably landing scallops at New Bedford and shipping some back to the Mid-Atlantic dealers.

NJ boats also caught a considerable amount of scallops in 2004 from the DMV Area, the ETA, and the HCA. They also tended to fish more inshore of the ETA and the HCA. As a result of the proposed alternatives, vessels from NJ would be likely to increase fishing effort in these customary areas, or fish more on the north side of the Hudson Canyon (see chart for MA boats) or on Georges Bank. Some vessels landed scallops from the Georges Bank area back in NJ according to the VMS/VTR data. NJ vessel landing scallops in MA, for example, appear on the MA chart.

Vessels landing scallops in MA in 2004 fished in the Mid-Atlantic and the Georges Bank regions, including some trips to fish in the DMV Area, the ETA, and the HCA. More vessels landing in MA, however, also fished both sides of Hudson Canyon (north of the HCA), and on Georges Bank. Vessels landing in CT also fished in the HCA, north of the HCA, and took Georges Bank access area trips. These vessels would be less affected by a proposed DMV Area closure and would be more likely to use their open area DAS in the Georges Bank region, or north of the HCA.

Although the limited access vessels are mobile and could shift fishing effort to the north, seafood dealers and processors in NC and VA would have the greatest impacts. On the other hand, the ETA allocations are likely to be nearly as high as the total allocations in 2004 were for Mid-Atlantic vessels, particularly when the ability for Mid-Atlantic vessels to trade their Georges Bank access area trips are taken into account. Thus the re-opening of the ETA at the same time that the DMV Area is proposed to close would mitigate the localized effects of this area closure.

5.1.1.3 Open Area Management

Open area DAS are set by determining the level of effort that can be applied in open fishing areas that achieves the fishing mortality target ($F=0.20$) or optimum yield. Open area DAS allocations that achieve this objective depend on a number of factors considered by the PDT, including the following:

- The controlled access area TACs and associated effort allocations
- The amount of scallop fishing grounds closed each year and the exploitable number of scallops within them
- The distribution of fishing effort in relation to the amount and distribution of exploitable scallops in open areas
- The effects of localized overfishing³⁵ on the scallop resource, on bycatch, and on habitat.
- The number of vessels that are permitted and likely to fish for scallops
- The proportion of allocated days used by vessels

³⁵ Localized overfishing is allowable under the Magnuson Stevens Act and the National Standard 1 guidelines, but can have undesirable consequences that prevent the FMP from achieving optimum yield, particularly if the localized overfishing is persistent on a relatively sedentary stock.

- The amount of scallop catch that occurs by vessels not fishing under the DAS program (general category rules)
- Set-asides for funding scallop-related research and mandatory observers.

To calculate the open area DAS allocations for each alternative (projection scenario), a total catch is determined that will achieve a given fishing mortality rate (adding to the mortality in controlled access areas), taking into account the projected size frequency of scallops for each sub-region³⁶. Open area DAS use that is estimated to cause fishing mortality to exceed $F=0.20$ would not be appropriate, nor would very high fishing mortality in substantial portions of the open areas.

The table below shows the effect of various open area DAS use levels with respect to various area rotation options. Status quo and No Action would have the same result in 2006, because the two alternatives mainly differ in how the ETA is classified in 2007. Both alternatives would allocate 67 full-time DAS in 2006 to use in open areas. The fishing mortality in the important South Channel sub-region is estimated to be $F=0.74$ (50% exploitation rate), about three times F_{MSY} . Fishing mortality in the Delmarva sub-region is estimated to be $F=0.40$ (31%). Overall scallop mortality is estimated to be $F=0.13$ (12%).

In comparison, the Framework 18 rotation alternatives (with HCA available for fishing with open area DAS) would produce fishing mortality of $F=0.92$ (58%) with a 30,000 open area DAS use (equivalent to 84 full-time open area DAS). Delmarva fishing mortality is estimated to be $F=0.50$ (38%) and total scallop mortality is estimated to be $F=0.18$ (16%). Allocations that bring open area DAS use down to 20,000 DAS (equivalent to 52 full-time open area DAS) would bring South Channel scallop mortality down to $F=0.58$ (42%) and Delmarva mortality down to $F=0.32$ (26%). Allocations that bring open area DAS used down to 15,000 DAS (equivalent to 36 full-time open area DAS) bring South Channel scallop mortality down to $F=0.43$ (33%), Delmarva mortality down to $F=0.23$ (20%), and overall scallop mortality down to $F=0.11$ (10%).

The DMV Area closure projection scenario also classifies the HCA as restricted for taking 2005 area trips and includes the effect of postponing 2/3rd of the 2005 trips into 2006 and 2007. With 20,000 open area DAS use (equivalent to 52 full-time open area DAS), South Channel scallop mortality is estimated to be $F=0.80$ (53%), Delmarva mortality is estimated to be $F=0.34$ (28%), and overall mortality estimated to be $F=0.14$ (12%). The open area fishing mortality rates are higher than for the Framework 18 rotation alternatives which do not include the extension of HCA controlled access, because the 20,000 open area DAS would be applied in a smaller area, due to the partial closure of the HCA, i.e. it would not be open for fishing with open area DAS.

In 2007, the No Action and Status quo alternatives classify the ETA differently. No Action would allow the ETA to open to fishing with open area DAS, while the Status quo alternative would open the ETA as a controlled access area and a TAC equivalent to an $F=0.32$ target (allowing a nine trip per full-time vessel allocation).

With No Action, the projection model indicates that nearly all open area fishing effort would occur within the DMV Area (see table below), causing fishing mortality to equal 0.40 (). With the status quo, the ETA catch would be limited so that fishing mortality is equal to $F=0.32$, and the allowable DAS allocation (19 full-time DAS) would be applied elsewhere. Under the status quo scenario, fishing

³⁶ The PDT applied seven sub-regions in the projection model, drawn from an aggregation of scallop survey strata. These sub-regions are consistent with those used for the scallop stock assessment and include the following open-area sub-regions (region): Northeast Part (GB), Southeast Part (GB), South Channel (GB), Long Island (MA), NY Bight South (MA), Delmarva (MA), and VA Beach (MA).

mortality would be below $F=0.24$ () in all open area sub-regions, except for the South Channel where mortality is estimated to be $F=0.36$ ().

Allocations that allow total mortality to equal $F=0.20$ (17%) in 2007 with Framework 18 rotation would allow for total DAS allocations of 67 to 72 full-time open area DAS, depending on the allocations and mortality in 2006. These projections estimate that these scenarios would cause South Channel fishing mortality to equal $F=1.04$ (62%), $F=0.99$ (60%), and $F=0.98$ (60%), respectively. Delmarva fishing mortality is estimated to be $F=0.58$ (42%), $F=0.49$ (37%), and $F=0.45$ (35%), respectively. With partial closure of the HCA, full closure of the DMV Area in 2007, and 20,000 open area DAS use, the projections estimate open area fishing mortality of $F=0.96$ (59%) for the South Channel, with an overall mortality rate of $F=0.17$ (15%).

The PDT examined these effects on fishing mortality and the amount of scallop fishing effort that would occur in open fishing areas. Since fishing mortality is proportional to area swept, these data also have implications for finfish bycatch, scallop non-catch mortality, and for habitat effects. **Taking these considerations into account, the PDT recommended that to achieve optimum yield the open area DAS allocations should not exceed 20,000 DAS whether or not the DMV Area closed to fishing in 2007, or whether or not the HCA remained classified as a controlled access area in 2006 and 2007.**

While evaluating how many open area DAS could be allocated to achieve optimum yield, the PDT took into account the following factors, consistent with the regulations at CFR §648.55(d):

- Differential fishing mortality rates for the various spatial components of the resource;
- Overall yields from the portions of the scallop resource available to the fishery;
- Outlook for phasing in and out closed or controlled access areas under the Area Rotation Program; and
- Potential adverse impacts on EFH.

The effect on overall yields is estimated through the various projections and take into account the outlook for area rotation. Adverse impacts on EFH are considered to be proportional, but not linear to the total amount of scallop fishing effort and are associated with the distribution of that effort. Since the projection submodel that estimates the distribution of future fishing effort among the sub-regions indicates that a higher amount of effort in 2006 and 2007 will occur in the South Channel and SE Part areas, reducing fishing effort below the amount needed to produce mortality equal to $F=0.20$ would help reduce the potential adverse impacts on EFH. Nonetheless, EFH is primarily protected through long-term area closures established by both Amendment 13 to the Multispecies FMP.

Table 79. Fishing mortality estimates by sub-region classified for fishing with open area DAS, by alternative.

The preferred alternative is the last column to the right (shaded).

Area name	Status quo		No action		Framework 18 - 30K open DAS		Framework 18 - 20K open DAS		Framework 18 - 15K open DAS		DMV closure - 20K open DAS	
	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007	2006	2007
Delmarva	0.40	0.19	0.40	0.02	0.50	0.58	0.32	0.49	0.23	0.45	0.34	
Elephant Trunk Area				0.40								
Hudson Canyon Area	0.55	0.21	0.55	0.02	0.68	0.65	0.43	0.57	0.32	0.55		
Long Island	0.43	0.14	0.43	0.01	0.53	0.42	0.34	0.37	0.25	0.35	0.36	0.42
New York Bight South	0.24	0.10	0.24	0.01	0.29	0.33	0.19	0.27	0.14	0.24	0.20	0.31
Northeast Part	0.40	0.13	0.40	0.01	0.49	0.40	0.31	0.34	0.23	0.32	0.33	0.39
South Channel	0.74	0.36	0.74	0.04	0.92	1.04	0.58	0.99	0.43	0.98	0.80	0.96
Southeast Part	0.66	0.16	0.66	0.02	0.82	0.48	0.52	0.46	0.38	0.46	0.55	0.51
Virginia Beach	0.22	0.18	0.22	0.02	0.27	0.59	0.17	0.46	0.13	0.42	0.18	0.54

Total DAS allocations, total DAS use, estimated total scallop fishing mortality, and open area DAS allocations for full-time, part-time, and occasional vessels are shown in the table below. Before calculating the DAS allocations for individual vessels, a three percent set-aside was deducted from the open area DAS estimates to produce a pool of DAS to support scallop-related research and provide funding for mandatory observers. In addition, the PDT estimated that general category landings in 2004 accounted for an amount equivalent to the landings from 2,500 full-time DAS. The PDT assumed that the general category landings would be equivalent to 3,000 full-time DAS in 2005 and 3,500 DAS in 2006 and 2007. These assumed values were deducted from the allowable DAS use to calculate the limited access open area DAS allocations in 2006 and 2007.

For the No Action alternative, a 67 DAS allocation would produce a total scallop mortality equal to $F=0.13$. Keeping overall DAS at about 30,000 in 2007, would allow for 62 DAS and produce an estimated mortality of $F=0.18$ in 2007, after taking into account the current rotation schedule set by Framework 16/39 for the Georges Bank access areas.

With the status quo alternative, 67 full-time open area DAS would generate a total mortality of $F=0.13$, but when the ETA would open with an $F=0.32$ target and nine trips, the open area full-time DAS allocation could only be 19 DAS to achieve a total scallop mortality of $F=0.20$.

With Framework 18 rotation and an allocation of 20,000 open area DAS in 2006 and 2007, each full-time vessel would be allocated 52 DAS in 2006 and 63 DAS in 2007, producing a total mortality rate of 0.13 and 0.19, respectively. With a two-year extension of controlled access for the HCA, a 20,000 DAS open area allocation would allow for a 52 full-time open area DAS allocation and produce a total fishing mortality rate of $F=0.14$ in 2006. To achieve an $F=0.20$ target in 2007 with Framework 18 rotation and the two-year extension of controlled access for the HCA, would allow for a 72 full-time open area DAS allocation in 2007.

The Council adopted the PDT recommendation as a preferred alternative that open area DAS should not exceed 20,000 DAS in 2006 and 2007. It also adopted as a preferred alternative the PDT recommendation to close the DMV Area in 2007 when the ETA re-opens as a controlled access area. This preferred alternative would allow for a full-time open area DAS allocation of 52 DAS in 2006 and 51 DAS in 2007. Part-time and occasional vessels would be allocated a 40% and 8.33% share, accordingly. This area rotation and DAS allocations (DMV closure – 20k open DAS in the table below) is estimated to cause fishing mortality to equal $F=0.14$ in 2006 and $F=0.17$ in 2007.

Table 80. Total open area DAS allocations, estimated DAS used, and estimated total fishing mortality for various Framework 18 area rotation scenarios and open area effort allocations to achieve optimum yield. The preferred alternative is the second to last row (shaded).

Scenario	Fishing year	Sum of Total allocated limited access DAS	Sum of Projected limited access DAS use	Total fishing mortality	Sum of Full-time open area DAS	Sum of Part-time open area DAS	Sum of Occasional open area DAS
Status quo	2006	36,305	30,056	0.13	67	27	6
	2007	55,189	35,166	0.20	19	8	2
No action	2006	36,306	30,058	0.13	67	27	6
	2007	36,311	30,146	0.18	62	25	5
FW 18: 2Yr HCA restriction	2006	39,017	29,591	0.14	52	21	4
	2007	52,644	40,166	0.20	71	28	6
Fw 18 rotation - 24.7K DAS	2006	43,844	34,243	0.15	67	27	6
	2007	51,758	39,312	0.20	68	27	6
Framework 18 - 30K open DAS	2006	49,257	39,459	0.18	84	34	7
	2007	51,285	38,856	0.20	67	27	6
Framework 18 - 20k open DAS 2006-07	2006	39,080	19,385	0.13	52	21	4
	2007	49,937	22,538	0.19	63	25	5
Framework 18 - 20K open DAS 2006	2006	39,098	29,670	0.13	52	21	4
	2007	52,022	39,566	0.20	69	28	6
Framework 18 - 15K open DAS	2006	34,071	24,825	0.11	36	14	3
	2007	53,044	40,551	0.20	72	29	6
DMV closure - Scenario 1	2006	39,017	29,591	0.14	52	21	4
	2007	54,876	42,316	0.20	78	31	7
DMV closure - 20K open DAS	2006	39,017	29,591	0.14	52	21	4
	2007	46,323	34,075	0.17	51	20	4
DMV closure - 18K open DAS	2006	37,092	27,737	0.13	46	18	4
	2007	44,269	32,095	0.16	45	18	4

5.1.1.4 Limited Access Crew Limits

Increasing the seven person crew limit is expected to increase the amount of scallops a vessel can process per day. In open areas, this action would increase fishing mortality if the DAS allocations are constant, or decrease DAS allocations if the fishing mortality targets are to be met. In controlled access areas, on the other hand, the catches by a vessel are limited by the amount of trips a vessel may take and an 18,000 lb. possession limit. Vessels are charged 12 DAS no matter the length of the controlled access area trip and many vessels with seven crew persons are able to land the possession limit in 6 to 8 days, due to the large scallop size and relative ease of catching large amounts of scallops. In most cases, the daily catch rates are controlled by the shucking capacity of the crew.

Crew limits were initially established in 1994 by Amendment 4 (NEFMC 1993) when the plan was changed to use DAS and gear size as the primary controls on fishing mortality and size selectivity. A nine person limit was approved to limit the amount of scallop mortality per DAS allocated to vessels and as a partial control on size selectivity, replacing the average meat count regulation. Before Amendment 4, vessels often took 11 to 14 persons onboard to target abundant amounts of small scallops in the early 1990s. As scallop abundance declined, more vessels began taking fewer crew and often took 9 crew persons when catches were around 400-600 lbs./day.

An important factor recognized in Amendment 4 was that a crew limit would prevent the fleet from again targeting and landing large amounts of small scallops when strong year classes occurred. Because crews process roughly the same amount of scallops in number, a vessel with a crew limit could land more by targeting larger scallops, which was intended to improve yield-per-recruit. Later, it became apparent that even the 9 person crew limit and a 3½" dredge ring were insufficient to replace the meat count regulation when strong year classes of small scallops appear. In response, the Council reduced the crew limit to seven persons via Framework Adjustment 1 (NEFMC 1995).

Even though at face value crew limits on controlled access area trips only influence trip length, there are some other important effects or responses from higher crew limits or especially having no restriction on crew. In response, a vessel with more crew can:

Shuck more scallops per day and shorten controlled access area trips

The first effect is the result of simply having more people available to shuck scallops and has no biological implications, since the catch in number of scallops is the same as long as the vessel lands no more than 18,000 lbs. Fishing costs will decline, but the profits are distributed among a greater number of crew (see Section 5.2 for an economic analysis).

Assign gear and scallop handling tasks to specific crew to keep others shucking with fewer interruptions

The second effect also has no biological implications on controlled access area trips, but the daily catch rate increases in an exponential fashion in response to increasing efficiency. Thus the daily catch would increase more than expected, possibly reaching the point when fishing is no longer shucking-limited. Ideally, vessel owners like to balance catch with shucking capacity to maximize profits.

One notable incentive, however, is for a vessel to shorten the trips as much as possible by having large crews aboard. If the captain and owner believe that daily catch rates will decline through the season or there is a risk of an area closing due to bycatch, vessels may attempt to make the trips as short and frequent as possible. From an owner's point of view, an optimal trip might be one where the vessel carries enough crew to deckload the equivalent of 18,000 lbs. of scallop meats and shuck all the scallops during a short fishing time and on the return to port. This might be an extreme response, but deckloading scallops has been associated with increases in discarding and discard mortality. It also has safety implications.

Target smaller scallops in a controlled access area

Particularly if the vessel carries enough crew where fishing is no longer shucking limited (either by declines in availability of larger scallops or because the vessel is carrying excess crew), the vessel may begin to target smaller scallops which in some areas may be more abundant. Of course, 4" rings help to prevent targeting of small scallops more than 3½" rings once did, but this does not prevent vessels using trawls or using illegal methods to fish from targeting smaller scallops.

Even with 4" rings, the cull size for a large crew could be quite different than that for a seven person crew. Vessels with large crews which target beds having smaller scallops in controlled access areas would reduce the benefits of area rotation, allowing scallops to be harvested at smaller size and reducing yield-per-recruit. When the TAC is set to achieve a fishing mortality target and vessels start targeting smaller scallops, it could cause the fishery to exceed the mortality target and potentially cause overfishing. Increasing the average size of landed scallops from 15 to 25 count for example, increases mortality by 67 percent.

Conclusion

While a modest one or two person increase in the crew limit could improve profits, shorten controlled access area trips, reduce crew fatigue, and improve safety, larger increases (or eliminating the crew limit) could cause vessels to significantly change how they catch and process scallops. It could induce derby-style fishing behavior if captains expect declining daily catch rates through the season or an early area closure due to bycatch. It could also cause increases in the daily processing capacity of a vessels, significantly greater than that expected at face value.

Quantitative analysis

Empirical measurements by Dr. James Kirkley (VIMS, NEFMC 1993a) showed that shucking rates averaged about 3.8 to 4.5 seconds per scallop. Larger scallops took closer to 4.5 seconds, but the extra time is more than compensated by the size of the scallop meat. Catches of larger scallops, even if fewer in number, produce larger landings in weight and induce vessels to seek out larger scallops when they are available. Vessels with more experienced and faster crews had shucking rates closer to 3.8 seconds per scallop. Thus with more crew onboard, vessels could shuck and process more scallop weight per day and with a scallop possession limit, the trips would thus become shorter.

With a seven person crew working 14 hours per day and averaging 30 minutes per hour shucking (the rest of the time used for handling gear, sorting the catch, and bagging the scallop meats), for example, could process about 2,100 pounds scallops averaging 20 count (Figure 15). As a result, it would take 8.6 days of fishing to catch and process 18,000 lbs. Vessels can process more weight per day of larger scallops. With the same assumptions about shucking time and efficiency, a vessel with a seven person crew can process 2,800 lbs. of 15 count scallops and land 18,000 lbs. in 6.4 days of fishing³⁷.

Likewise, if there is no change in fishing behavior or efficiency a vessel with an eight person crew could process 3,200 lbs. of 15 count scallops and land 18,000 lbs. in 5.6 days, or 14% less time. Working the same hours, a vessel with a nine person crew could process 3,600 lbs. of 15 count scallops and land 18,000 lbs. in 5.0 days, or a 28% improvement over a seven person crew. If the catch rate of the gear and vessel is greater than these amounts, the production is shucking-limited and there is no reason to target smaller scallops, even if they are more abundant.

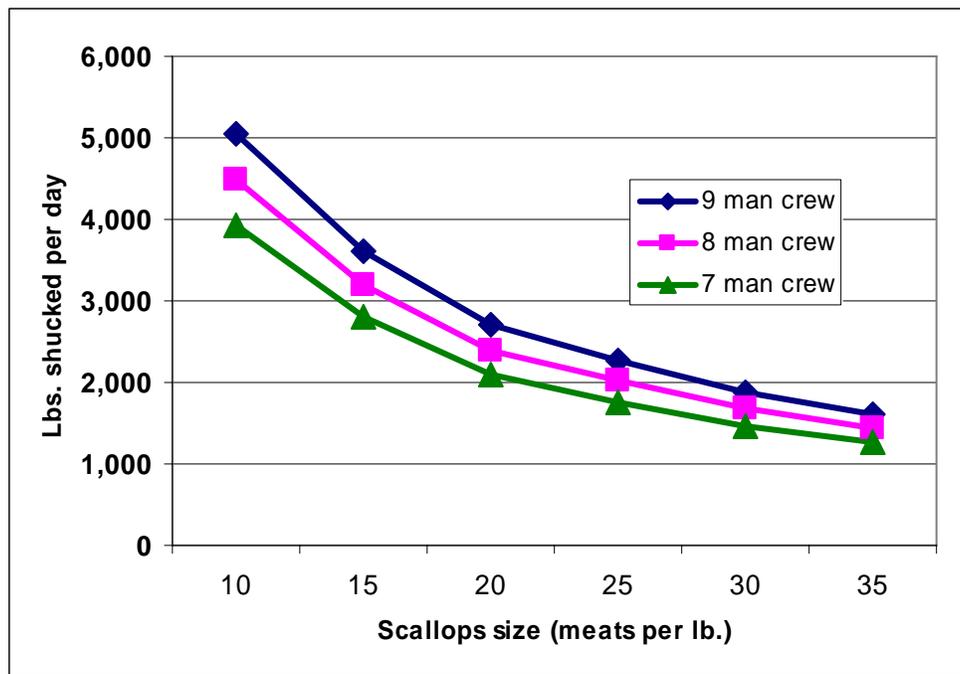


Figure 15. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons, assumed to work 14 hr/d and shucking scallops for 30 min/hr.

³⁷ Steaming time when the crew is not shucking scallops must be added to these estimates to compare with dock-to-dock trip length.

In the shorter controlled access area trips, crews may work longer hours per day. The high catches in controlled access areas also may allow the crew to spend more time per hour shucking scallops, rather than attending to the gear and hauling back. A seven person crew working 16 hour days and shucking an average of 40 min/hr can process almost 4,300 lb./day of 15 count scallops (Figure 16) and shorten a trip landing 18,000 lbs. to 4.2 days. Still, increasing the crew to 8 persons increases the daily landings by 14% and to by 28% for nine persons.

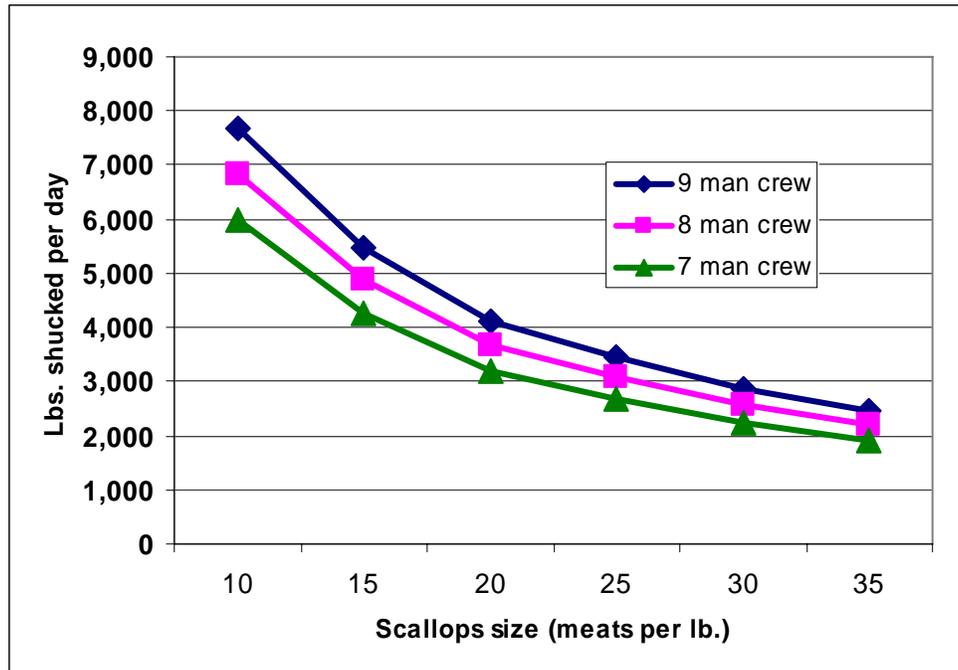


Figure 16. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons, assumed to work 16 hr/d and shucking scallops for 40 min/hr. These assumptions would be more typical of a controlled access area trip, where crews sometimes work longer hours on shorter trips.

If vessels with more crew divide the tasks to make the crew more efficient, it increases the average amount of time per hour that is dedicated to shucking. Even slight changes have large impacts on the potential daily scallop landings. For example, if a seven person crew is able to average 35 minutes of shucking per hour in a 16 hour day, the vessel could land 3,700 lbs. of scallops per day (Figure 17) and make an 18,000 lb. trip in 4.8 days (Figure 18). By carrying more crew and dividing up the tasks, a vessel might increase the average time the crew shucks. Increasing this value to 38 min/hr causes the daily landings for an eight person crew to 4,600 lbs./day, making the trip in 3.9 days of fishing time. This is a 24% increase in daily catch compared to a seven person crew. The processing rate would be 6,200 lbs./day, allowing the vessel to complete the trip with 2.9 days of fishing. This is a 65 percent increase in daily catch compared to a seven person crew.

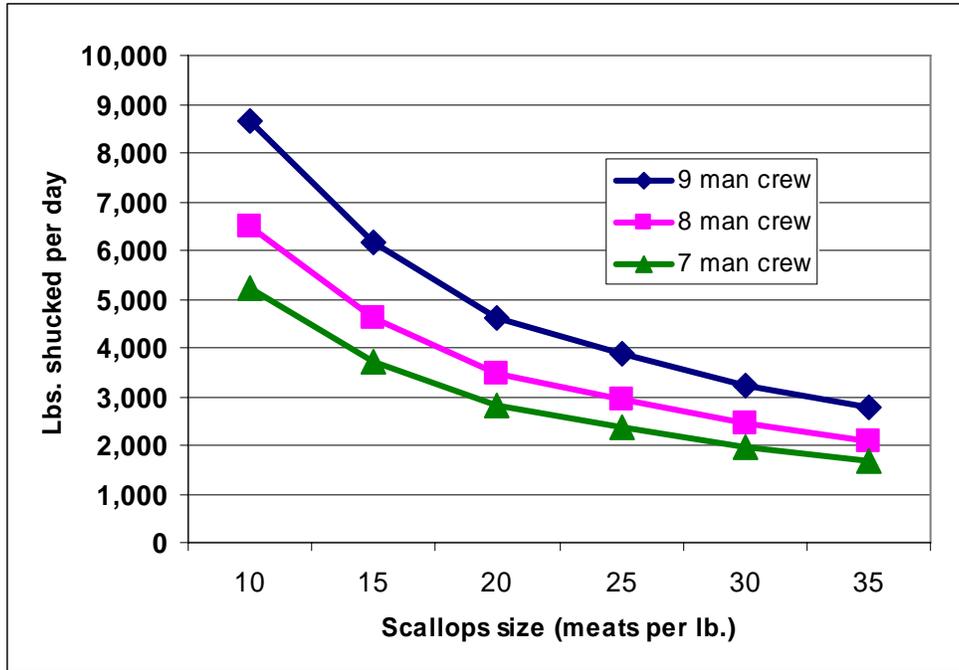


Figure 17. Shucking capacity isoquants by average scallop size for vessels with crews ranging from 7 to 9 persons.

The analysis is from Kirkley in Amendment 4 (NEFMC 1993), assuming crews work 13.5 hours per day. It also assumed that a seven person crew shucks scallops 35 min/hr, eight person crew shucks scallops 38 min/hr, and a nine person crew shucks scallops 45 min/hr.

Lastly, a 3,200 lbs./day catch rate would be satisfactory for a vessel carrying a crew of seven, but a vessel with 9 or more persons would have excess capacity and labor. The vessel could take fewer crew on future trips, or it could target smaller scallops which may by coincidence have a higher catch rate, in this example 4,000 lbs./day (Figure 19). A vessel carrying nine crewmembers could for example shuck more scallops in weight of the more abundant 25 count scallops, increasing the mortality associated with 18,000 lbs. of landings by 67%.

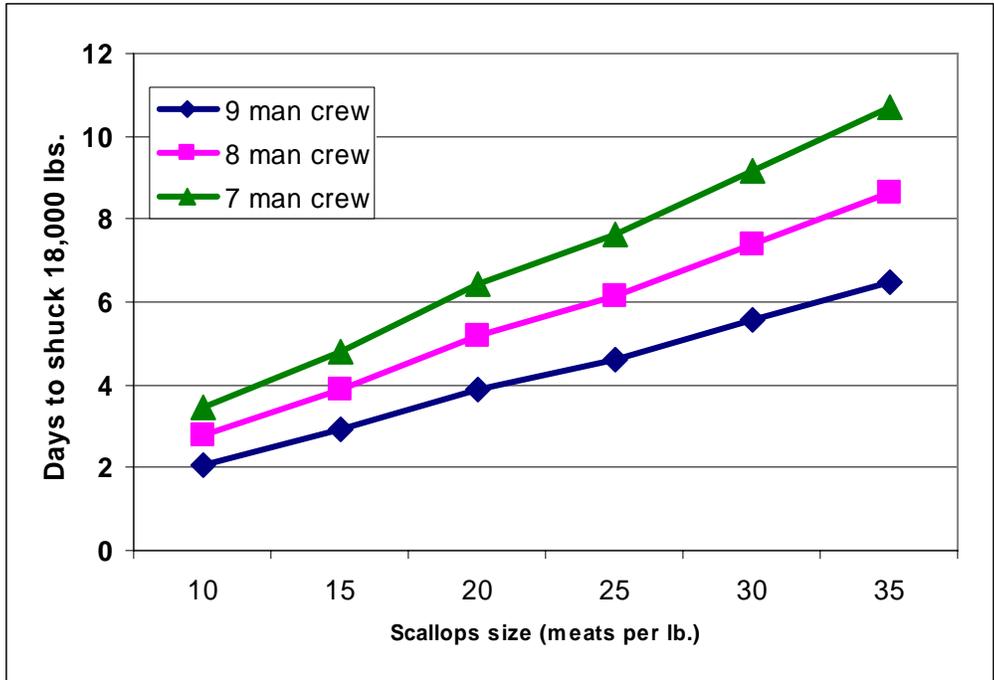


Figure 18. Days to catch and shuck 18,000 lbs. of scallops. Steaming time when the crew is not shucking scallops must be added to these estimates to compare with dock-to-dock trip duration.

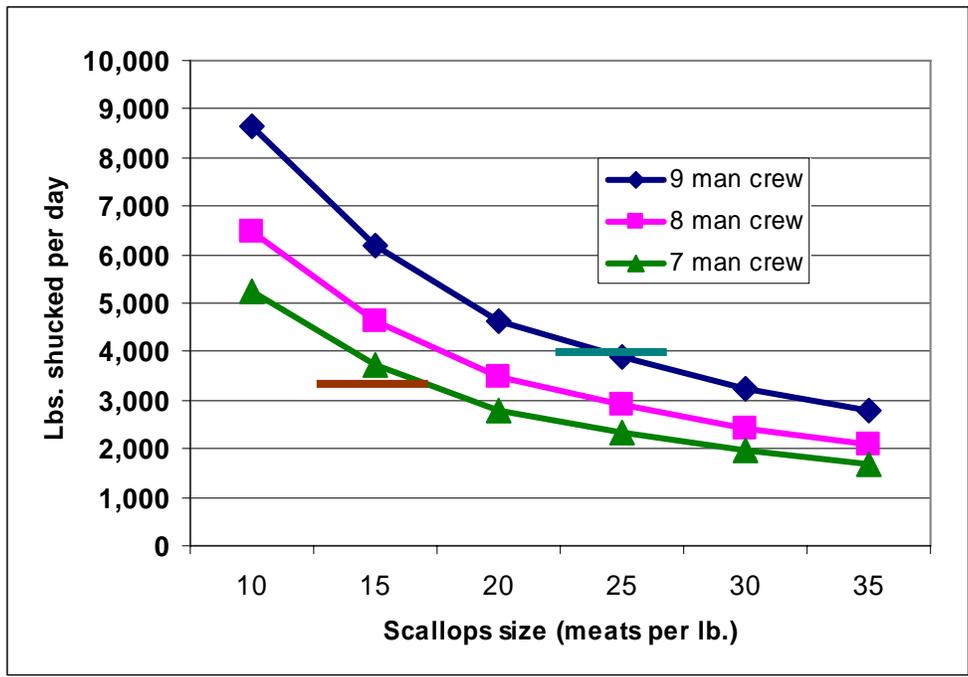


Figure 19. Shucking capacity compared to example catch rate of the gear and vessel. As an example, the catch rate of 15 count scallops is 3,200 lbs./day, but 4,000 lbs./day of 25 count scallops.

5.1.1.5 Other Measures (trip exchange deadline, trip exchanges, and broken trip exemption program)

There appear to be few if any biological impacts associated with eliminating the trip exchange deadline, allowing equal exchanges of controlled access area trips between vessels, and an extension of the compensation trip deadline associated with the broken trip exemption program.

Eliminating the trip exchange deadline will simply allow vessels a greater period of time to make adjustments. There do not appear to be any implications associated with compliance and monitoring and the measure will not increase fishing effort beyond what is already allocated for achieving optimum yield.

Likewise the exchanges of controlled access area trips between vessels preserves the amount and location of controlled access area trips that may be taken by the fleet. Transfers of area access trips between areas will not have a meaningful biological impact because the trip lengths and size of scallops are projected to be similar. On the other hand, exchanges of access area trips and open area DAS could have biological implications, particularly if the transfers occur so that a more efficient and powerful vessel receives open area DAS in exchange for access area trips. Limiting transfers to within permit categories with a ratio that is set to achieve an equal level of average catch in numbers will help mitigate this potential effort increase in the open areas.

A 60 day extension of the ability for a vessel to take a compensation trip for a broken trip at the end of the fishing year is unlikely to have considerable biological consequences. However if the area where the compensation trip is authorized is closed at the beginning of a fishing year and re-opens later in the year, there could be some biological implications associated with changes in meat yield and finfish distribution.

The proposed changes in the research set-aside program are unlikely to have more than a marginal biological impact. The impacts associated with allowing combined compensation/research trips to take place in closed areas will depend on how much research takes place, and where and when the trips are taken. Since only a portion of the 2% TAC might be used in this way, the overall effects are expected to be low, but problems might arise if a substantial part of the 2% TAC set aside is allocated to research being conducted in a closed area. Other proposed changes in the research set-aside are likely to have positive indirect biological benefits arising from better research. The proposed changes would allow more research to be conducted during the critical spring period to assess the effect of seasonal changes of scallop meat yield and bycatch rates.

5.1.2 Impacts on Non-target Species

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 scallops (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 did not occur until December 2004, however. Amendment 10 also estimated that the reductions in open area DAS would also reduce total area swept and increase scallop LPUE, particularly of larger scallops in the long-term.

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. This analysis was instrumental in the Council's decision to set a target sampling level and amount of set-aside funding. Open area trips were sparsely sampled in the data available for analysis in Framework 16/39, so Framework 16/39 assumed that for many species the bycatch in access areas would be lower for most species than it would be in open fishing areas. Because of the large difference in fishing time per DAS between access area and open area trips, Framework 16/39 predicted that area access would reduce impacts on bycatch, except for species that were found in much greater concentrations in the access areas. This potential was mitigated by allowing access to the Georges Bank closed areas during seasons when bycatch was estimated to be lower than it would be during spring spawning.

Recently, NMFS has increased sea sampling on trips made by scallop vessels using dredges. Since 1999, sea sampling in access areas had been enhanced by an industry-funded TAC set-aside program. During this time, 584 scallop trips and 31,230 tows had been observed (see Appendix V). The data from this program was very useful to estimate total bycatch in access areas. NMFS also increased sampling on open area trips, particularly in the Mid-Atlantic, in response to new observations of interactions with sea turtles in the Hudson Canyon Area (on access area trips using observers funded by the TAC set-aside). Sampling increased from 26 trips and 1,348 tows in 2002 to 77 trips and 4,896 tows in 2003, enabling NMFS to estimate the total incidental captures of sea turtles during 2003. Sampling again increased to 173 trips and 8,100 tows in 2004, almost an eight-fold increase from the sampling level during 1992 to 2002.

Bycatch is of course not only a function of the amount of fishing and the selectivity of the gear, but also a function of the distribution of fishing effort, the distribution of the incidental catch, and the abundance of the species that are vulnerable to capture by dredges. As a result, the spatial and temporal components of effort and future effort are important considerations.

As a result of the increased sampling in 2003 and 2004, we can begin to estimate and compare reliable estimates of finfish bycatch rates in access and open fishing areas, stratified by region and quarter. Appendix V summarizes the spatial and temporal distribution of observed hauls and also summarizes the mean catch rates (lbs/hr) of commonly observed species in scallop dredge incidental catches. The estimates include both the kept and discarded components. The intent of this preliminary work is to estimate mean catches and their variance by species and stratum. Observed incidental catches were expanded by the ratio of hours fished on observed trips to unobserved trips, stratified by sub-region and quarter. The effort from unobserved trips were derived from preliminary VMS data for 2004. Also, expanded estimates were also made using the ratio of kept scallops on observed to total trips, again stratified by sub-region and quarter. Scallop landings reported through the VTR system were distributed evenly over the areas fished on a trip matched basis, using the VMS data for each trip³⁸. These strata were chosen to be compatible with the scallop projections to be able to forecast bycatch for various management scenarios. Due to constraints on time, total bycatch estimates for 2004 were made only for yellowtail flounder, monkfish, barndoor skate, and cod. Variance estimates and projections of bycatch for various management scenarios were not possible.

38 Imputed vessel speeds from successive pollings between one and five knots were deemed to be 'fishing' as opposed to 'shucking' or 'steaming'.

5.1.2.1 Areas specific limits on fishing by limited access vessels

Both alternatives considered provide incentive for vessels to fish as efficiently as possible, reducing overall fishing time. When vessels spend less time on the bottom, overall interaction with potential bycatch is reduced. The status quo alternative of maximum trips with possession limits (proposed action) has in most controlled access areas in the past, provided vessels with an opportunity to seek out areas with less bycatch and more scallops because it does not take 12 DAS to harvest the possession limit.

5.1.2.2 Area Rotation Measures

Similar to the biological projections, much of the bycatch analysis is interrelated; therefore, the impacts cannot always be separated out for each measure. Impacts have to be assessed in aggregate because overall bycatch impacts depend on fishing time, area and season. Therefore, due to the nature of rotational area management, most of the bycatch analyses are aggregated; however, they are separated in the section below when possible. Most important, one of the fundamental purposes of rotational area management is to reduce bycatch by concentrating effort in areas with high scallop catch.

5.1.2.2.1 Trip and DAS allocations

Area rotation measures have a large impact on when, where, and how much vessels fish and therefore has a large role in determining the amount of incidental catch that will take place. Even though bycatch projections were not yet possible, meaningful comparisons can be made to analyze the effects of area access on bycatch of various finfish.

Table 81 shows the average (unstratified) catch rate of various species on observed hauls, in open and access areas during 2004. The access areas were the Nantucket Lightship Area and Closed Area II (open November 2 to December 31) and the Hudson Canyon Area (open all year). Most of the access area fishing effort occurred in the Hudson Canyon Area due in part to the seasonal closure and late implementation of Framework 16/39. This was also reflected in the sampling where 6030 of the 7172 observed tows were in the Hudson Canyon Area.

Beside scallop discard and misc. invertebrates, the most frequent bycatch was comprised of little skate, unclassified skate, and monkfish. These probably are also the largest components of total bycatch, but the mean stratified estimates have not yet been calculated using the VMS and VTR data. Although relatively infrequent,

Because of the amount of observed effort in the Hudson Canyon Area, the ratios between the access and open area catches are more reflective of the conditions expected in 2007, when a large amount of fishing effort is expected in the ETA and Georges Bank access area allocations revert to two trips.

Although little skate was the largest bycatch component, it is widely distributed and the catch rate in the open area is nearly what is in access areas, giving a ration of 0.89 (Table 81). In contrast, American plaice and yellowtail flounder have more defined distributions and the catch rates were considerably higher in the access areas in 2004 than in the open areas, giving a 21.61 and 6.66 ratio, respectively, despite being found infrequently in the HCA. American plaice was however a very minor component of the observed bycatch, with an access area catch rate of 0.087 lbs./hr.

A more important component is yellowtail flounder, particularly given the recent pessimistic stock assessments. As reported in Appendix V, the highest catch rates occurred in Closed Area II. Yellowtail flounder catches are however capped by an allocation for the access program that is 10% of the overall yellowtail flounder TAC for each stock. When the catches meet the 10% TAC, no more

access area trips would be allowed for that year and some of the unused fishing effort may be applied in open fishing areas. Shifting one trip from Closed Area I to Closed Area II in 2006 makes it more likely that the yellowtail flounder TAC would be filled and closed Closed Area II to scallop fishing. Transfers of effort to open areas are unlikely to increase yellowtail flounder catches above what they would otherwise be in the access areas (see Section 5.1.5 for further analysis), particularly using a ratio to effect a transfer that is neutral with respect to scallop mortality.

Table 81. Average observed catch rates in access and open areas during 2004, including the Hudson Canyon Area.

	Access area unstratified mean weight per hour (lbs.)	Open area unstratified mean weight per hour (lbs.)	Ratio
Hauls observed	7172	7922	
American plaice	0.087	0.004	21.61
Yellowtail flounder	2.152	0.323	6.66
American lobster	0.161	0.043	3.71
Winter skate	6.783	1.926	3.52
Witch flounder	0.352	0.124	2.84
Fourspot flounder	1.839	0.798	2.30
Unclassified skate	27.243	11.882	2.29
Spiny dogfish	0.948	0.442	2.14
Monkfish	25.838	13.414	1.93
Summer flounder	6.025	3.222	1.87
Barndoor skate	0.234	0.187	1.25
Winter flounder	0.428	0.369	1.16
Cod	0.007	0.007	0.91
Little skate	38.692	43.236	0.89
Silver hake	0.106	0.138	0.76
White hake	0.014	0.085	0.16
Thorny skate	0.000	0.003	0.04
Other finfish	2.388	5.094	0.47
Misc. crustaceans	4.385	5.983	0.73
Other invertebrates	24.818	26.796	0.93
Scallop clappers	8.339	6.312	1.32
Scallops	185.560	87.310	2.13

Bycatch ratios that are greater than the ratio of area swept per DAS in access areas vs. open areas suggest that bycatch for that species would increase for each DAS fished in the access areas vs. in the open areas. When the ETA area is open in 2007, the area swept per DAS in the access areas is projected to be 0.016 nm²/DAS and in the open areas 0.229 nm²/DAS, giving a ration of 14.4 (Table 82). This ratio implies that the area swept in the access areas will be 14.4 times less in the access areas than equivalent days-at-sea equally distributed in the open areas.

Species whose bycatch ratios are above this ratio only include American plaice. In all other cases, the analysis implies that finfish bycatch per DAS used would be less in the access areas than for an equivalent DAS in the open areas. Even if only Closed Area I is considered because the area swept per DAS is greater, the only species whose access/open catch rate ratios exceed this value (4.6) are American plaice and yellowtail flounder. The highest catch rates for yellowtail flounder were however observed in Closed Area II.

Thus in 2007, the access program is expected to reduce bycatch in nearly all cases due primarily to the greatly reduced fishing time needed to catch scallops in the access areas. The only two species where this conclusion is not indicated by the data are for American plaice and yellowtail flounder. American plaice is a very minor component of the observed catch and yellowtail flounder catches will be limited by the 10% TAC.

Table 82. Projected area swept per DAS used in access and open areas for the preferred alternative

Area fished (nm2) per DAS used		Fishing year	
Status	Area name	2006	2007
Access	Closed Area I access	0.052	0.050
	Closed Area II access	0.047	
	Elephant Trunk Area		0.011
	Nantucket Lightship Area access	0.017	0.019
Access Total		0.036	0.016
Open	Delmarva	0.178	
	Long Island	0.258	0.268
	New York Bight South	0.283	0.244
	Northeast Part	0.299	0.302
	Open areas combined	0.189	0.222
	South Channel	0.142	0.182
	Southeast Part	0.263	0.298
	Virginia Beach	0.144	0.127
Open Total		0.200	0.229
Open/Access ratio		5.485	14.398

Omitting the HCA observed catch from the above analysis gives results that are more consistent with the proposed area rotation and allocations in 2006, when there are no additional access area trips in the Mid-Atlantic region. Doing so compares the open area finfish catch rates with those in the access areas that were open in 2004, Closed Area II and the Nantucket Lightship Area. Closed Area I was not open to fishing since 2001, when there were too few open area trips observed (4) to reliably estimate open area incidental catch.

Not surprisingly, this analysis increases the access/open catch ratios of species that are endemic to Georges Bank, particularly for species exhibiting well defined distributions that overlap the preferred habitat for scallops. During 2004, the catches in CA2 and the NLSA were 102 times higher in the access areas for American plaice and 42 times higher for yellowtail flounder (Table 83), largely because these species are nearly absent from the Mid-Atlantic where a substantial portion (>70%) of the open area effort occurred. American lobster (20.3), winter skate (14.0) and barndoor skate (7.8) also had high catch rate ratios, comparing the rates in the access area to those in the open areas. Winter flounder and cod were ranked next, the cod catch rates being 5.7 times higher in the access areas, particularly in Closed Area II.

The projections for 2006 indicate that area swept per DAS will be 5.5 times higher in the open areas than in the controlled access areas. The ratio is lower in 2006 than in 2007 because the ETA is not open and where the scallop catch rates are projected to be very high in 2007. Also a greater proportion of trips would be in CA I and CA II, where the area swept per DAS is higher than in the Nantucket Lightship Area. Area swept per DAS is also projected to be lower in 2006 than in 2007.

Based on this analysis of catch and area swept ratios, species whose incidental catch is expected to increase in 2006 as a result of allocating area access trips include the above named species, including yellowtail flounder, winter skate, barndoor skate, winter flounder, and cod. All catches will however be limited if the yellowtail flounder catch reaches the 10% TAC limit.

Table 83. Average observed catch rates in access and open areas during 2004, excluding the Hudson Canyon Area.

	Access area unstratified mean weight per hour (lbs.)	Open area unstratified mean weight per hour (lbs.)	Ratio
Hauls observed	1142	7922	
American plaice	0.407	0.004	101.558
Yellowtail flounder	13.505	0.323	41.808
American lobster	0.884	0.043	20.331
Winter skate	26.871	1.926	13.951
Barndoor skate	1.455	0.187	7.785
Winter flounder	2.479	0.369	6.715
Cod	0.041	0.007	5.701
Unclassified skate	48.441	11.882	4.077
Spiny dogfish	1.700	0.442	3.843
Fourspot flounder	2.787	0.798	3.492
Witch flounder	0.178	0.124	1.438
Summer flounder	4.366	3.222	1.355
Monkfish	16.728	13.414	1.247
Silver hake	0.085	0.138	0.613
Little skate	20.748	43.236	0.480
White hake	0.033	0.085	0.383
Thorny skate	0.000	0.003	0.000
Other finfish	1.779	5.094	0.349
Misc. crustaceans	6.375	5.983	1.065
Other invertebrates	26.159	26.796	0.976
Scallop clappers	24.749	6.312	3.921
Scallops	85.597	87.310	0.980

5.1.2.2 Elephant Trunk Seasonal closure

Minimizing bycatch is a primary reason for the seasonal closures of the Georges Bank access areas, from February 1 to June 15. The analysis supporting this measure was originally done in Framework 11 (1999) and updated in more recent framework adjustments, including Framework 16/39 (Section 6.2.7, 2004). These seasonal closures were chosen to coincide with the timing of spawning activity for many species on Georges Bank, when some species form spawning aggregations. No new research or bycatch information has become available to change this previous assessment, partly because it is difficult to conduct experimental gear research as an experimental fishery in a closed area.

The ETA proposed seasonal closures are primarily focused on minimizing interactions with sea turtles, but may have secondary benefits from closing the area when discard mortality might be higher than average. There is insufficient information about bycatch rates by season in the ETA to determine how the closure would affect the catch rates of finfish and other non-target species, however.

Discard mortality of finfish depends on numerous factors including the type of gear in use and how long it is towed, the type of species in the target catch, the on-deck sorting methods employed and the amount of time the species spend on deck (see for example Pranovi, et. al. 2001), and avian predators (Ross and Hokenson, 1997). Climatic factors such as air and water temperatures, coupled with the time the discarded catch spends on the deck during sorting can influence the amount of mortality that occurs (Ross and Hokenson, 1997). These effects on discard mortality vary by the morphology and size of the species, probably related to their ruggedness and resistance to desiccation, although Davis and Schreck (2005) found little correspondence between plasma constituents and discard mortality in Pacific halibut.

Finfish discard mortality is generally perceived as being high, due to the type of heavy gear in use and the type of target species, which probably affects discard survival due to maceration of the catch by scallop shells and debris, especially during prolonged tows. When fishing in a scallop access area, however, fishermen tend to take much shorter tows due to the high scallop catch rates. On the other hand, the time on deck can increase considerably as a result of the large catches and the crew's capability to process the catch. Some taxa, like skates, appear to be better able to tolerate being caught and discarded than others.

Trips that fishermen take when the air and water temperatures are cooler may have less discard mortality than trips when they are warmer, all other things being equal. The fishermen's behavior that affects sorting time and the presence of predators will also have an effect.

In the vicinity of the Elephant Trunk Area, air temperature peaks in July and August, with September being the third warmest month and October being the fifth (Figure 20). Sea surface temperature lags slightly, but follows a similar pattern. Average sea temperature in July to September approaches or exceeds the temperature tolerance of sea scallops (see Affected Environment discussion in the Amendment 10 SEIS).

Trips that are displaced from September and October to June through August probably will not have much affect on discard mortality. The data however suggest that discard mortality due to thermal effects would be lower if the displaced ETA trips are taken in January to May, or postponed to November and December. Due to the ruggedness of the gear and the target species, this effect on discard mortality is likely to be small for more fragile species. Scallops themselves however tolerate being caught and sorted fairly well, but the time on deck and temperature appear to have a significant bearing on scallop discard mortality (W. DuPaul, pers.comm.). Since the ETA catches will be very large and vessels are likely to take longer to sort the catch, differences in when the trips are taken could reduce scallop discard mortality, particularly where air and water temperatures exceed biological tolerances.

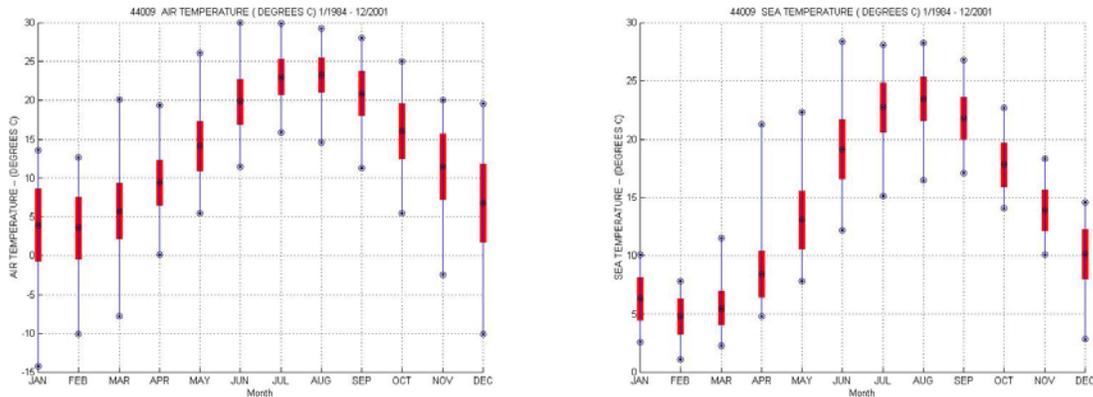


Figure 20. Monthly mean and variation of air temperature (left) and sea surface temperature (right) for Station 44009

(a buoy located off Delaware Bay, 26 NM southeast of Cape May, NJ. Source: National Data Buoy Center, http://www.ndbc.noaa.gov/station_history.php?station=44009).

5.1.2.2.3 Adjustments when Yellowtail Flounder catches reach 10% TAC limit

5.1.2.2.3.1 *Effects on yellowtail flounder, cod, monkfish, and barndoor skate*

Estimates of bycatch rates in 2004 are shown in the tables below for yellowtail flounder, cod, monkfish, and barndoor skate. The estimated total catch of yellowtail flounder was 105 mt from the access areas and 19.4 mt from the open areas. Catch rates were higher within the Georges Bank access areas than in the open areas, implying that an equal shift of effort would reduce yellowtail flounder bycatch.

For cod, the estimated total bycatch in 2004 was 0.3 mt inside the access areas and 1.6 mt from the open areas. Except for the Cape Cod strata, the bycatch rates were similar inside and outside of the access areas. Catch rates of cod in the Cape Cod strata were considerably higher (0.45 pounds per hour) than in other areas, possibly due to seasonal effects or from sampling biases.

Monkfish are one of the most frequently caught finfish with scallop dredges. Total bycatch estimates for 2004 were 1503 mt from the access areas and 1729 mt from the open areas. Catch rates appear to be higher inside the access areas than in the open areas, implying that an shift of an equal amount of fishing effort would reduce monkfish bycatch.

Total bycatch of barndoor skate during 2004 was estimated to be 10.2 mt in the access areas and 12.7 mt in the open areas. Catch rates for the Georges Bank stock area was higher inside of Closed Area II than in the adjacent open areas. On the other hand, catch rates in the Nantucket Lightship Area appear to be higher than in the adjacent South Channel area. Changes in bycatch from a yellowtail flounder closure would depend on the resulting geographical (and possibly seasonal) distribution of effort relative to barndoor skate distribution.

Table 84. Summary of 2004 yellowtail flounder bycatch rates by stock area from sea sampled trips and total catch estimates.

The total catch estimates were expanded using VMS effort data tied to VTR landings data on a trip by trip basis.

Yellowtail flounder	Trips sampled	Average catch per hour fished	Average catch per scallop landed	VMS Hours fished	Estimated total catch (mt)	Percent of 2004 TAC
Access areas						
Georges Bank	20	14.32	4.3%	14,135	91.8	1.5%
Southern New England	10	4.61	0.6%	6,275	13.1	1.9%
Mid-Atlantic	95	0.00	0.0%	111,777	0.1	
Cape cod	0	0	0.0%	0	0	0.0%
Combined, unstratified estimate (mt)	122	1.70	0.9%	132,271	102.1	
Combined, stratified estimate (mt)			61.9		105.0	1.3%
Open areas						
Georges Bank	12	2.88	1.8%	13,053	12.3	0.2%
Southern New England	12	1.59	0.9%	5,795	3.8	0.5%
Mid-Atlantic	171	0.02	0.0%	264,895	2.1	
Cape cod	5	0.47	0.3%	5,865	1.3	0.1%
Combined, unstratified estimate (mt)	156	0.23	0.2%	292,938	30.5	
Combined, stratified estimate (mt)			15.4		19.4	0.4%

Table 85. Summary of 2004 cod bycatch rates by stock area from sea sampled trips and total catch estimates.

The total catch estimates were expanded using VMS effort data tied to VTR landings data on a trip by trip basis.

COD	Trips sampled	Average catch per hour fished	Average catch per scallop landed	VMS Hours fished	Estimated total catch (mt)
Access areas					
Georges Bank	20	0.05	0.0%	14,135	0.3
Southern New England	10	0.00	0.0%	6,275	0.0
Mid-Atlantic	95	0.00	0.0%	111,777	0.0
Cape cod	0	0	0.0%	0	0
Combined, unstratified estimate	122	0.01	0.0%	132,271	0.3
Combined, stratified estimate (mt)			0.2		0.3
Open areas					
Georges Bank	12	0.05	0.0%	13,053	0.4
Southern New England	12	0.01	0.0%	5,795	0.0
Mid-Atlantic	171	0.00	0.0%	264,895	0.0
Cape cod	5	0.45	0.3%	5,865	1.2
Combined, unstratified estimate (mt)	156	0.00	0.0%	292,938	0.6
Combined, stratified estimate (mt)			1.0		1.6

Table 86. Summary of 2004 monkfish bycatch rates by stock area from sea sampled trips and total catch estimates.

The total catch estimates were expanded using VMS effort data tied to VTR landings data on a trip by trip basis.

MONKFISH	Trips sampled	Average catch per hour fished	Average catch per scallop landed	VMS Hours fished	Estimated total catch (mt)
Access areas					
Georges Bank	20	10.22	3.1%	14,135	66
Southern New England	10	18.50	2.5%	6,275	53
Mid-Atlantic	95	27.32	13.5%	111,777	1,385
Cape cod	0	0	0.0%	0	0
Combined, unstratified estimate	122	25.30	12.9%	132,271	1,518
Combined, stratified estimate (mt)			1,197		1,503
Open areas					
Georges Bank	12	8.28	6.8%	13,053	35
Southern New England	12	12.06	8.0%	5,795	30
Mid-Atlantic	171	13.26	10.4%	264,895	1,646
Cape cod	5	6.87	4.5%	5,865	18
Combined, unstratified estimate	156	13.01	9.9%	292,938	1,728
Combined, stratified estimate (mt)			1,664		1,729

Table 87. Summary of 2004 barndoor skate bycatch rates by stock area from sea sampled trips and total catch estimates.

The total catch estimates were expanded using VMS effort data tied to VTR landings data on a trip by trip basis.

BARNDOOR SKATE	Trips sampled	Average catch per hour fished	Average catch per scallop landed	VMS Hours fished	Estimated total catch (mt)
Access areas					
Georges Bank	20	1.39	0.4%	14,135	8.9
Southern New England	10	0.39	0.1%	6,275	1.1
Mid-Atlantic	95	0.00	0.0%	111,777	0.2
Cape cod	0	0	0.0%	0	0
Combined, unstratified estimate	122	0.17	0.1%	132,271	10.0
Combined, stratified estimate (mt)			6.1		10.2
Open areas					
Georges Bank	12	0.94	0.6%	13,053	3.9
Southern New England	12	1.76	1.0%	5,795	4.3
Mid-Atlantic	171	0.03	0.0%	264,895	2.9
Cape cod	5	0.63	0.4%	5,865	1.7
Combined, unstratified estimate	156	0.13	0.1%	292,938	17.3
Combined, stratified estimate (mt)			9.9		12.7

5.1.2.2.3.2 Likelihood of closure

It is difficult to estimate the likelihood of closures due to yellowtail flounder catches in 2006 and 2007. However, the 2004 bycatch rates can be applied to projections of total hours fished by area to estimate total bycatch and compare those estimates to the TACs. There are two sources of uncertainty in these estimates, however. First, the access areas opened late on November 2, 2004 and the bycatch rates reflect the seasonal values in November 2004 to February 2005. In 2006 and 2007, the controlled access area would be open for vessels taking trips beginning on June 15. Also, Closed Area I was not open to fishing in 2004 and the catch rates in the adjacent area of Georges Bank was used as a substitute. Second, inter-annual and seasonal changes in scallop meat yield and finfish distribution could lead to results that are considerable different than the estimates in the table below.

With Framework 18 area access (the first two scenarios in the table below), the yellowtail flounder bycatch estimate is 103.4 mt in 2006, 6.5 mt from the Nantucket Lightship Area. According to the recent groundfish assessment, the total US share of the Georges Bank yellowtail flounder yield is between 1400 and 2400 mt. Ten percent of these preliminary TACs is higher than the estimates shown below. In 2007, there would be only two Georges Bank access area trips allocated and the projections suggest that the yellowtail flounder catch would be 25.8 mt, 5.1 mt from the Nantucket Lightship Area.

If the 2004 bycatch rates are consistent with those observed in 2006 and 2007, it does not appear that the access areas would close due to catches of yellowtail flounder, but there is considerable uncertainty in these projections due to the factors described above.

Table 88. Projection of yellowtail flounder bycatch in access areas by management alternative for 2006 and 2007. Bycatch rates are summarized from observed trips during 2004.

Yellowtail flounder bycatch (mt)		Area name					Grand Total
Scenario	Fishing year	Closed Area I access	Closed Area II access	Elephant Trunk Area	Nantucket Lightship Area access		
DMV closure - 20K open DAS	2006	35.5	61.4		6.5	103.4	
	2007	20.7	0.0	0.0	5.1	25.8	
DMV closure - 20K open DAS Total		56.2	61.4	0.0	11.6	129.2	
Framework 18 - 20k open DAS 2006-07	2006	35.5	61.4		6.5	103.4	
	2007	20.7	0.0	0.0	5.1	25.8	
Framework 18 - 20k open DAS 2006-07 Total		56.2	61.4	0.0	11.6	129.2	
No action	2006	20.9	0.0		5.1	26.0	
	2007	0.0	61.9		5.1	66.9	
No action Total		20.9	61.9	0.0	10.1	93.0	
Status quo	2006	20.9	0.0		5.1	26.0	
	2007	0.0	61.9	0.0	5.1	66.9	
Status quo Total		20.9	61.9	0.0	10.1	93.0	

5.1.2.2.3.3 *Transfers of Access Area Effort from Yellowtail Flounder Closures*

If and when the Georges Bank access area yellowtail flounder catches equal the TAC set-aside, the FMP has allowed vessels with unused trips to transfer all or a portion of them to fish for scallops in open areas. Since implementation of this rotational management policy in Amendment 10 and Framework 16/39, no closures have taken place due to yellowtail flounder catches. Nonetheless, this management policy has had a positive effect because it reduces the incentive to fish as quickly as possible to get the trips in before a potential closure (vs. risking losing the trips altogether).

In 2005, Framework 16/39 would allow vessels to take in open areas up to two unused Georges Bank access area trips (24 DAS), if the vessels could not take them due to a yellowtail flounder caused closure. This limit on transferred trips is equal to the total number of trips allocated in 2006. Hence a vessel that takes no Georges Bank access area trips would be able to take them in the open areas if the access areas close due to yellowtail flounder catches.

Since Framework 18 contemplates an allocation of five Georges Bank access area trips in 2006 and two trips in 2007, there is a potential for a derby-style fishing effect to occur particularly for vessels taking the three additional trips in 2006³⁹. Allowing vessels to transfer up to five unused Georges Bank access area trips to open areas could cause a major shift in fishing effort onto scallop fishing grounds in open areas.

Framework 18 considers and analyses four types of effort transfers:

1. Allow vessels to transfer all unused trips, increasing the open area DAS allocation by a pre-defined ratio that conserves the number of scallops landed and is scallop mortality neutral (Section 3.3.1.2.4.1)
2. Allow vessels to fish an equal number of unused trips in open areas, each having an 18,000 lb. scallop possession limit (Section 3.3.1.2.4.2)
3. Allocate half the number of trips and allocate the remainder half way through the season if it appears that the yellowtail flounder catches will not exceed the 10% TAC limit (Section 3.3.1.2.4.3)
4. Increase a vessel's open area DAS allocation by 12 DAS for each unused Georges Bank access area trip, with a maximum of 24 DAS. This is the No Action alternative (Section 3.3.1.2.4.4)

Alternative 3 above does not allow vessels to transfer unused trips to the open fishing areas, so has the fewest impacts on scallop mortality and environmental effects outside of the Georges Bank access areas. It may postpone the derby-style fishery that could develop until the latter half of the year and helps to ensure that vessels are able to take half of the trips. It does not, however, eliminate the economic effect and the incentive to fish trips as quickly as possible.

It is difficult to know when areas might close to scallop fishing due to yellowtail flounder catches equaling the 10% TAC limit. For starters, the limit has not at this time been set by the Multispecies FMP for 2006 or 2007. And although the projection do not indicate that the yellowtail flounder catch will approach the level of what the 10% TAC may be, the 2004 data on which the estimate is based was derived from observed trips in November to February when the access areas were open. Since the areas would be open in 2006 and 2007 beginning on June 15th, the catch rates for the full season may be different from what was observed in 2004.

³⁹ With the revised TACs and rotation schedule, Framework 18 would allocate five, rather than two trips and the No Action alternative would allow a vessel to transfer no more than two unused trips to open areas when the access areas closed from yellowtail flounder catches.

If the average number of unused trips when the areas close is less than or equal to two trips per vessel, the least conservative alternative is Alternative 4 (2.49 nm² per unused trip) and Alternative 1 is the most conservative (1.27 to 1.44 nm² per trip)⁴⁰. If the areas close so early that the average number of unused trips is 4 or more, then Alternative 4 is the most conservative but a derby style fishing behavior is more likely to develop than for Alternatives 1 and 2. The table below shows the total effect in terms of the average number of unused trips remaining when an area closes. More details for each transfer alternative and area rotation alternative is given in the next section.

Table 89. Total area swept (nm²) for all trips taken in open areas and expected average scallop landings (lbs. meats) per trip in open areas for the preferred alternative in 2006.

	Average number of unused trips taken in open fishing areas after yellowtail flounder closures					Total expected scallop landings (lbs. meats) per trip
	1 trip	2 trips	3 trips	4 trips	5 trips	
<u>Alternative 1 (Section 3.3.1.2.4.1)</u> Pre-set proportion of DAS added to open area allocation to catch same number of scallops ⁴¹	1.38	2.75	4.13	5.50	6.88	12,514
<u>Alternative 2 (Section 3.3.1.2.4.2)</u> Equal number of trips with an 18,000 lb. possession limit	1.98	3.96	5.94	7.92	9.90	18,000
<u>Alternative 3 (Section 3.3.1.2.4.3)</u> Incremental trip allocation	0	0	0	0	0	0
<u>Alternative 4 (Section 3.3.1.2.4.4)</u> 12 DAS per trip, not to exceed 24 DAS added to open area allocation	2.49	4.97	4.97	4.97	4.97	22,612

5.1.2.2.3.3.1 Estimated effort transfers

5.1.2.2.3.3.1.1 Pre-set proportion of DAS transferred for Alternative 1

In alternative 1 (Section 3.3.1.2.4.1), the pre-defined ratio of open area DAS added to a vessels allocation upon a yellowtail flounder catch closure of a Georges Bank area varies according to the area being closed and according to the rotation management area alternatives that the Council selects. This variation occurs because of differences in the scallop catch rates and average scallop size in the open and access areas.

For the preferred alternative described in the caption below, the biological projections estimate that the average scallop size in the Georges Bank access areas would range from 10.7 to 12.2 meats per pound and the average trip length would range from 6.5 to 7.0 days to catch and land 18,000 lbs. of scallop meats. In the open areas, the projections estimate the average landings per DAS would be 1,884 lbs. and the average scallop size would be 16.8 meats per pound.

⁴⁰ These estimates are for 2006 and assume the preferred alternative with Framework 18 revised area rotation, a 2-year extension of the Hudson Canyon Area controlled access, and a 20,000 DAS allocation for fishing in open areas.

⁴¹ Proportion of DAS added and area swept varies by area being closed, due to scallop size differences.

The number of open area DAS that would catch an equivalent number of scallops, assuming that scallop size selection by the gear and crew remain constant, is calculated with the following formula:

$$Open_DAS = \left(18,000 \text{ lbs.} / Open_LPUE \right) * \left(Access_scallop_mpp / Open_scallop_mpp \right)$$

Thus, for the preferred alternative described below, the open area DAS tradeoff should be 7.0 DAS per trip if Closed Area I closes, 6.9 DAS per trip if Closed Area II closes, and 6.1 DAS per trip if the Nantucket Lightship Area closes to scallop fishing. Applying the average landings per DAS in the open areas gives an expected average open area scallop catch ranging from 11,499 to 13,127 lbs. per trip transferred, or a 27 to 36 percent reduction in the scallop landings per trip transferred to the open areas. The actual catches on a given trip will of course vary due to time and location when and where the trip fishes.

Table 90. Example of DAS tradeoffs in 2006 for unused trips with Framework 18 area rotation, a 2 year extension of the Hudson Canyon Area, and 20,000 open area DAS allocation. The DMV Area would close in 2007 under the preferred alternative.

DMV closure - 20K open DAS	2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,586	12.2	7.0	7.0	13,127
Closed Area II access	18,000	2,604	12.0	6.9	6.9	12,917
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	6.1	11,499
Open areas		1,884	16.8			

5.1.2.2.3.3.1.2 Changes in area swept from transferred trips

Effects on finfish bycatch and habitat impacts are more related to fishing time than to scallop catch in pounds or number, or scallop mortality. Fishing time and area swept are calculated in the projection model based on estimated catch per day and shucking capacity of the crew. The estimates in this section are based on the shucking capacity of a seven person crew. If the crew limit is raised or eliminated for controlled access area trips, the total area swept per day in the access areas would of course rise, but the duration of the trip would shrink. As long as the crew can shuck less than what a dredge can catch in 24 hours and it does not affect the cull size and scallop selectivity, these two effects would offset each other. If the crew number increases and shucking capacity exceeds the dredge's catch in 24 hours of fishing, then the area swept per trip on controlled access area trips would rise. Likewise, if the scallop size selection favors smaller scallops, the area swept per trip on an access area trip could also rise. Both results would increase total fishing time in access area trips, but reduce the marginal effect of transferring the same trips to open areas, where a seven person crew limit would apply.

For the preferred alternative, the area swept per trip ranges from 0.107 nm² in the Nantucket Lightship Area to 0.361 nm² in Closed Area I. These estimates take into account the amount of fishing time to catch the amount a seven person crew can shuck. Shucking capacity in pounds of scallops is higher when the scallops are larger.

If the trips are transferred to the open areas using the ratios in the table above, the area swept to fish those days ranges from 1.27 to 1.44 nm² per trip. On a trip per trip basis, this increases area swept by a ration of 4.0 for a trip transferred from Closed Area I to 11.8 for a trip transferred from the Nantucket Lightship Area. These higher amounts of fishing occur because the projections estimate that

the scallops in the open areas are more widespread and take longer to catch than they are in the access areas.

To catch 18,000 lbs. in the open areas (Alternative 2), it takes longer because the scallops are smaller, but they are constant because the allowance for a trip transferred from each access area is also constant. Taking the average catch per DAS and the average area swept per DAS for open areas into account, an average trip would generate an area swept of 1.98 nm² to catch 18,000 lbs. of scallops. This would increase area swept by 5.5 times for transferred Closed Area I trips to 18.5 times for transferred Nantucket Lightship Area trips. For each transferred trip, this alternative would increase scallop fishing mortality by 27 to 36 percent.

If the vessels were able to transfer an equal number of DAS allocated to the open area for each unused trip, each 12 day trip in the open areas is estimated to generate an area swept of 2.5 nm² per trip. For each transferred trip, this alternative would increase area swept per trip by 6.9 times for transferred Closed Area I trips to 23.3 for transferred Nantucket Lightship Area trips. Assuming that the trip catches and lands 1,884 lbs. per DAS, a 12 day trip would generate 22,612 lbs. of landings, increasing both scallop fishing mortality (by 72 to 97 percent) and landings if the average number of unused trips was less than 4 trips.

Table 91. Area swept estimates for trips transferred from access to open areas during 2006.

DMV closure - 20K open DAS	2006	Ratio method		Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm ²) per trip	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.4)
Closed Area I access	0.361	1.444	3.995	1.980	5.478	2.487	6.881
Closed Area II access	0.325	1.421	4.371	1.980	6.091	2.487	7.652
Nantucket Lightship Area access	0.107	1.265	11.841	1.980	18.536	2.487	23.286
Open areas							

For the preferred alternative in 2007 (see table below), the DAS tradeoff ratio for areas closed would be 7.3 DAS for each trip transferred from Closed Area I and 6.4 DAS for each trip transferred from the Nantucket Lightship Area. There are few yellowtail flounder caught in the Elephant Trunk Area and there is no TAC limit for yellowtail flounder catches there, but the tradeoff could operate the same way. The projections estimate the average size of scallops landed from Closed Area I to be 12.4 meats per pound, 10.8 meats per pound from the Nantucket Lightship Area, and 17.2 meats per pound from open areas. Taking these values and the estimated average open area catch rate (1,771 lbs. landed per DAS) into account gives an estimated open area catch per trip of 12,974 lbs. for Closed Area I transferred trips and 11,363 lbs. for Nantucket Lightship Area transferred trips.

Table 92. DAS tradeoffs in 2007 for unused trips with Framework 18 area rotation, a 2 year extension of the Hudson Canyon Area, and 20,000 open area DAS allocation. The DMV Area would close in 2007.

DMV closure - 20K open DAS

2007

	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	7.3	12,974
Elephant Trunk Area	18,000	2,512	13.0	7.2	7.7	13,684
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.4	11,363
Open areas		1,771	17.2			

For Alternative 1, transferred trips in 2007 would cause area swept per trip to increase to 1.5 nm² for Nantucket Lightship Area transferred trips and 1.7 nm² for Closed Area I transferred trip (see table below), increasing area swept per trip by 12.5 and 4.9 times, respectively. With an 18,000 lb. possession limit for transferred trips, each trip would generate 2.4 nm² of area swept, increasing the area swept per trip by 6.7 times for Closed Area I and 19.7 times for Nantucket Lightship Area trips transferred to open areas. Similarly, a 12 DAS trip in open areas (Alternative 4) would increase area swept to 2.8 nm² per trip, or an increase of 7.9 times for Closed Area I and 23.3 times for Nantucket Lightship Area transferred trips.

Table 93. Area swept estimates for trips transferred from access to open areas during 2007.

DMV closure - 20K open DAS	2007	Ratio method		Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm ²) per trip	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm ²) per trip in open areas (Alternative 3.3.1.2.4.4)
Closed Area I access	0.353	1.715	4.853	2.379	6.734	2.808	7.949
Elephant Trunk Area	0.077	1.809	23.534	2.379	30.956	2.808	36.540
Nantucket Lightship Area access	0.121	1.502	12.446	2.379	19.714	2.808	23.271
Open areas							

The tradeoff ratios for Alternative 1 of course vary according to rotation management area alternative. In general, the larger the scallops are in the open areas, the higher the amount of DAS that can be transferred to achieve a conservation-equivalent scallop fishing mortality rate. For the same area rotation alternative, higher open area DAS allocations (ranging from 15,000 to 30,000 DAS) would cause average scallop size and catch per DAS to decline, particularly in 2007 (and future years). Reducing the amount of area available to fish using open area DAS would have the same effect. The lower the catch rates and average size in the open areas increases the amount of area swept for all alternatives. The tables below give the Alternative 1 tradeoff ratios and differences in area swept per trip for 2006 and 2007, for a variety of rotation area management alternatives in Framework 18.

Table 94. Estimated DAS tradeoffs and open area catches in 2006 for Alternative 1.

No action		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,603	12.1	6.9	6.9	12,757	
Nantucket Lightship Area access	18,000	2,790	10.7	6.5	6.1	11,253	
Open areas		1,848	17.1				

Status quo		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,603	12.1	6.9	6.9	12,757	
Nantucket Lightship Area access	18,000	2,790	10.7	6.5	6.1	11,253	
Open areas		1,848	17.1				

Framework 18 - 15K open DAS		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,586	12.2	7.0	6.7	13,271	
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	5.9	11,625	
Open areas		1,966	16.6				

Framework 18 - 20K open DAS 2006		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,586	12.2	7.0	6.8	13,078	
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	6.0	11,455	
Open areas		1,909	16.8				

Framework 18 - 30K open DAS		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,586	12.2	7.0	7.1	12,666	
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	6.3	11,095	
Open areas		1,774	17.4				

FW 18: 2Yr HCA restriction		2006					
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch	
Closed Area I access	18,000	2,586	12.2	7.0	7.0	13,127	
Nantucket Lightship Area access	18,000	2,786	10.7	6.5	6.1	11,499	
Open areas		1,884	16.8				

Table 95. Area swept per trip estimates for 2006 yellowtail flounder closure DAS transfer alternatives.

No action	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.323	1.458	4.515	2.057	6.370	2.535	7.850	
Nantucket Lightship Area access	0.102	1.286	12.647	2.057	20.230	2.535	24.929	
Open areas								

Status quo	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.323	1.458	4.515	2.057	6.370	2.535	7.850	
Nantucket Lightship Area access	0.102	1.286	12.646	2.057	20.229	2.535	24.928	
Open areas								

Framework 18 - 15K open DAS	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.361	1.224	3.387	1.660	4.594	2.176	6.022	
Closed Area II access	0.325	1.204	3.706	1.660	5.108	2.176	6.696	
Nantucket Lightship Area access	0.107	1.072	10.039	1.660	15.545	2.176	20.378	
Open areas								

Framework 18 - 20K open DAS 2006	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.361	1.344	3.720	1.850	5.120	2.355	6.517	
Closed Area II access	0.325	1.323	4.070	1.850	5.693	2.355	7.246	
Nantucket Lightship Area access	0.107	1.178	11.026	1.850	17.325	2.355	22.052	
Open areas								

Framework 18 - 30K open DAS	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.361	1.631	4.514	2.318	6.414	2.741	7.585	
Closed Area II access	0.325	1.605	4.938	2.318	7.132	2.741	8.434	
Nantucket Lightship Area access	0.107	1.429	13.379	2.318	21.705	2.741	25.667	
Open areas								

FW 18: 2Yr HCA restriction	2006	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access	0.361	1.444	3.995	1.980	5.478	2.487	6.881	
Closed Area II access	0.325	1.421	4.371	1.980	6.091	2.487	7.652	
Nantucket Lightship Area access	0.107	1.265	11.841	1.980	18.536	2.487	23.286	
Open areas								

Table 96. Estimated DAS tradeoffs and open area catches in 2007 for Alternative 1.

No action		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area II access	18,000	2,641	11.7	6.8	6.4	15,851
Nantucket Lightship Area access	18,000	2,783	10.8	6.5	5.9	14,552
Open areas		2,471	13.3			

Status quo		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area II access	18,000	2,641	11.7	6.8	6.5	14,019
Elephant Trunk Area	18,000	2,502	13.1	7.2	7.3	15,695
Nantucket Lightship Area access	18,000	2,783	10.8	6.5	6.0	12,870
Open areas		2,149	15.1			

Framework 18 - 15K open DAS		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	6.9	13,643
Elephant Trunk Area	18,000	2,512	13.0	7.2	7.3	14,391
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.0	11,950
Open areas		1,983	16.3			

Framework 18 - 20k open DAS 2006-07		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	7.0	13,634
Elephant Trunk Area	18,000	2,512	13.0	7.2	7.4	14,381
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.2	11,942
Open areas		1,936	16.3			

Framework 18 - 30K open DAS		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	7.2	12,968
Elephant Trunk Area	18,000	2,512	13.0	7.2	7.5	13,679
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.3	11,358
Open areas		1,813	17.2			

FW 18: 2Yr HCA restriction		2007				
	Possession limit	Landings per DAS	Average meat count	Average access area trip length	Transferred open area DAS per trip	Expected open area catch
Closed Area I access	18,000	2,571	12.4	7.0	7.4	13,363
Elephant Trunk Area	18,000	2,512	13.0	7.2	7.8	14,095
Nantucket Lightship Area access	18,000	2,777	10.8	6.5	6.5	11,704
Open areas		1,805	16.7			

Table 97. Area swept per trip estimates for 2007 yellowtail flounder closure DAS transfer alternatives.

No action	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area II access		0.294	0.117	0.398	0.133	0.452	0.219	0.744
Nantucket Lightship Area access		0.115	0.107	0.929	0.133	1.149	0.219	1.894
Open areas								

Status quo	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area II access		0.294	0.792	2.696	1.017	3.461	1.457	4.958
Elephant Trunk Area		0.089	0.887	9.954	1.017	11.416	1.457	16.354
Nantucket Lightship Area access		0.115	0.727	6.299	1.017	8.809	1.457	12.619
Open areas								

Framework 18 - 15K open DAS	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access		0.353	1.123	3.180	1.482	4.195	1.959	5.544
Elephant Trunk Area		0.077	1.185	15.417	1.482	19.284	1.959	25.488
Nantucket Lightship Area access		0.121	0.984	8.153	1.482	12.281	1.959	16.232
Open areas								

Framework 18 - 20k open DAS 2006-07	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access		0.353	1.241	3.512	1.638	4.636	2.114	5.984
Elephant Trunk Area		0.077	1.309	17.029	1.638	21.314	2.114	27.507
Nantucket Lightship Area access		0.121	1.087	9.005	1.638	13.574	2.114	17.518
Open areas								

Framework 18 - 30K open DAS	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access		0.353	1.403	3.972	1.948	5.514	2.354	6.664
Elephant Trunk Area		0.077	1.480	19.261	1.948	25.346	2.354	30.634
Nantucket Lightship Area access		0.121	1.229	10.186	1.948	16.142	2.354	19.510
Open areas								

FW 18: 2Yr HCA restriction	2007	Ratio method			Land 18,000 lbs.		12 DAS per trip	
		Area swept (nm2) per trip	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.1)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.2)	Ratio	Area swept (nm2) per trip in open areas (Alternative 3.3.1.2.4.4)	Ratio
Closed Area I access		0.353	1.647	4.661	2.218	6.279	2.669	7.555
Elephant Trunk Area		0.077	1.737	22.603	2.218	28.865	2.669	34.730
Nantucket Lightship Area access		0.121	1.442	11.953	2.218	18.383	2.669	22.118
Open areas								

5.1.2.3 Effect of transfers on yellowtail flounder bycatch

The effect of the potential transfers of unused trips from Georges Bank access areas to the open area depends not only on the amount of effort transferred and changes in area swept per trip, but also on the relative distribution and catch rates of the bycatch species in question. The amount and distribution of open area fishing effort varies a little by projection scenario, but the projection model generally estimates that 63% of the open area effort in 2006 will be in the Georges Bank region.

The effect on yellowtail flounder catches is examined below. Catch rates per hour fished on observed trips during 2004 are given in the table below. For Closed Area II (Georges Bank) and the Nantucket Lightship Area (Southern New England), the catch rates in the access areas are 4.98 and 2.91 times higher in the access areas than in the adjacent open areas⁴². In the Mid-Atlantic, yellowtail flounder catch rates in the Hudson Canyon Area is 14% of the average for observed trips in the open areas of the Mid-Atlantic region (which include areas between Hudson Canyon and Long Island, NY).

Taking into account the re-distribution of transferred trips from Georges Bank access areas to open areas in 2006 (including 37% of trips assumed to be transferred from the Georges Bank access areas to Mid-Atlantic open areas), indicates that yellowtail flounder catches would be 35 times lower in the open areas than the same amount of time and area swept in the controlled access areas. However, the amount of fishing time and area swept is much lower than it would be in the open fishing areas (see the discussion above). Based on these results, any transfer of effort from the Georges Bank access areas to open areas that does not result in a 35-fold increase in fishing time and area swept would cause a decrease in yellowtail flounder catch, compared to the situation had all the trips occurred in the Georges Bank access areas.

There is however a considerable amount of uncertainty in these area swept and bycatch rates, which are magnified in the calculated ratios. The actual results in 2006 could differ markedly from these rough estimates.

Table 98. Yellowtail flounder catch rate per hour fished on observed trips during 2004.

<i>Region</i>	<i>Access</i>	<i>Open</i>	<i>Ratio</i>
Georges Bank	14.32	2.88	4.98
Southern New England	4.61	1.59	2.91
Cape Cod		0.47	
Mid-Atlantic	0.00	0.02	0.14
Unstratified mean	1.70	0.23	35.28 ⁴³

5.1.2.4 Open Area Management

Limits on open area DAS will have similar effects as those for scallop mortality, which the Council has intentionally set lower than that needed to achieve the $F=0.20$ target. The 20,000 DAS limit is intended to prevent localized depletion of scallops in open areas and increase long-term yields from

⁴² This may be as much to do with seasonal distribution of observed trips than due to differences in the distribution of yellowtail flounder abundance or gear selectivity in various areas.

⁴³ Ratio takes into account a projected 63% proportion of open area DAS taken in the Georges Bank region in 2006 for the preferred alternative.

those scallops. Alternatives that would allocate higher open area DAS are expected to potentially increase impacts on non-target species due to more fishing effort.

These open area effort limits directly and indirectly contribute to minimizing bycatch of non-target species. Directly, the effort limits prevent the fleet from fishing more DAS, causing higher amounts of incidental catch. Indirectly, the effort limits keep LPUE at higher levels which in turn reduces area swept and by inference bycatch. The combination of the open area effort limits, preventing localized depletion of scallops, and the gear regulations that improve selectivity minimize bycatch of non-target species to the extent practicable.

5.1.2.5 Limited access crew limits on limited access vessels

The amount of crew onboard processing the catch can directly influence discard mortality and indirectly influence catches of non-target species. As discussed above under seasonal closures, the amount of time that the catch remains on deck is a significant determinant of discard mortality – provided that the catch does not have mortal injuries before arriving on deck. The quicker the catch can be sorted and returned to the sea, the greater the chances of survival, particularly for the more robust taxa, such as skates.

Although the duration of tows on controlled access area trips is usually much less than those taken in open fishing areas, the catches are usually very large and may sit on deck for longer periods, while the crew processes the catch from earlier tows or simply takes longer to sort the larger catch. Having more crew onboard will of course allow quicker processing of the catch as it comes onboard.

Indirectly, the larger crews could enable the vessel to reduce the cull size⁴⁴ and fish in areas having smaller scallops. When this happens, it reduces selectivity, biomass, and long-term yield. More crew also allows a vessel to target scallops in an access area more effectively when the catches decline (as they did in the HCA during 2005), yet the amount of fishing time would increase. As a result of the lower scallop catch rates caused by fishing on smaller scallops in an access area (if and when larger scallops become scarcer), area swept and hence the catch of non-target species can increase.

5.1.2.6 Trip exchange deadline & controlled access area trip exchanges

Exchanges of controlled access area trips do not affect the amount of fishing time or fishing power, particularly since trip exchanges can only occur between vessels in the same permit category. The exchange only affects which vessels fish in each area, not the total amount of effort. As such, the changing the trip exchange deadline or allowing greater flexibility in trading trips is likely to have few effects on the catch of non-target species.

It is possible that vessels that fish more effectively in open areas might exchange a HCA or ETA trip to gain a Georges Bank area access trip in the hope that the areas close and the vessel is allowed to take unused DAS in open areas. There is however a lot of risk in this strategy the vessels could employ either because the Georges Bank access areas do not close or because the difference in vessel efficiencies are insufficient to overcome the difference in open area DAS due to the ratio that is applied (see Section 5.1.2.2.3)

⁴⁴ The cull size is the size at which some proportion of the scallops are retained and some discarded. This is usually measured as the size at which a scallop has a 50% probability of being retained and landed. The cull size varies with the crew and conditions. Typically, larger catches with a limited crew raise the cull size because it is easier to shuck a pound of large scallops than small scallops.

5.1.2.7 Broken trip exemption program

This liberalization of the broken trip exemption program would shift some access area effort from the last two months when an area is open (or the end of the fishing year) to the next two months when it is (or the start of the fishing year). For the Georges Bank areas, effort might be transferred from Dec. & Jan. to Jun. 15 – Aug. 15. For the ETA, effort might transfer from Jan.-Feb. 2008 to Mar.-Apr. 2008.

Insufficient data exist to be able to assess the effects of this change on non-target species. Species that are more abundant in the spring and early summer will experience higher catches, and vice versa. The new measure does however make it more likely that vessels will use this mechanism to carry forward unused access area trips from one year to the next.

5.1.2.8 Research set-aside program

Catching scallops on compensation trips to fund scallop research should not cause any change in catches of non-target species, unless the change is directly related to the type of research or the location where the trip is conducted. If due to the research the incidental catches are expected to be different than they would be on a normal commercial DAS, this effect should be analyzed in the EA or EIS accompanying the proposal.

Areas that remain closed for scallop fishing are classified as such either due to concerns about habitat (EFH closures), bycatch (seasonal Georges Bank access areas), or protected species (seasonal closure of the ETA). Allowing combination research/combination trips to take place may as a result increase incidental catches and discarding. It is impossible to quantify the net benefits of the potential increases of incidental catch, unless the value of the research is known. In general, the Council expects that allowing some types of research and compensation trips to occur will outweigh the negative impacts on non-target species, particularly since most of the research is expected to investigate ways to minimize non-target catch. Where incidental catch and discards are expected to vary from those associated with a commercial DAS in an open or access area, the proponent should analyze the direct, indirect, and cumulative effects and justify the action in the research application, EA, or EIS.

5.1.3 Impacts on Threatened, Endangered, and Other Protected Species

The Framework Adjustment 18 alternatives are evaluated below for their impacts on protected resources, with a focus on threatened and endangered sea turtles. Although there now have been documented marine mammal interactions with the scallop fishery (see Section 4.0 for a details about this issue), they are not included in the discussion below because of their scarce numbers relative to sea turtle interactions and observed trips. Future comments on impacts of the scallop fishery and management actions may include marine mammals if more information is available for use in developing comments.

5.1.3.1 Area specific limits on fishing by limited access vessels and a maximum number of trips by area with a scallop possession limit (Section 3.3.1.1)

Under the current provisions of the Scallop FMP, each controlled access area has a TAC that must be allocated among vessels that are authorized to fish. The current method, in use since 1999, establishes a scallop possession limit and authorizes each limited access vessel to take a certain number of trips in each controlled access area. These trip allocations have had some negative effects on safety and on fishing costs. A new alternative would allocate a certain number of pounds that a vessel may land from each controlled access area, allowing fishermen to determine the optimum length of a trip based on existing weather, expected price, and other factors.

Although both the area specific allocation of total pounds per vessel and the alternative under the current regulation (a maximum number of trips by area and a scallop possession limit) have both pros and cons that relate to administration, enforcement, monitoring and safety, neither are likely to affect sea turtle interactions in the scallop fishery. In the new alternative, the ability to catch more scallops per trip may result in longer area trips for some vessels, but could result in fewer trips overall. From a protected species perspective the absence of an effort increase would likely result in few discernable impacts between the total pound alternative and the status quo (proposed action).

5.1.3.2 Georges Bank area access measures (Section 3.3.1.2).

The Framework 18 proposed access schedule would keep the number of access trips and landings more consistent across years, as compared to the status quo alternative. The preferred alternative would allocate 5 access trips in 2006 and 2 in 2007 to Georges Bank (with 5 trips in the Elephant Trunk Area), while under the status quo there would be 3 trips in 2006 as well as 2007 (and 9 trips in the Elephant Trunk Area).

Both the revised Georges Bank schedule alternative and the contingency alternative would provide a higher number of Georges Bank area access trips in 2006, when there are no access trips scheduled for the Mid-Atlantic region and fewer trips in 2007 when the Elephant Trunk Area would re-open as a controlled access area. While benefits are expected to accrue to the scallop resource with the revised alternative as well as the contingency discussed below, the revised trip schedule for Closed Area I, Closed Area II and the Nantucket Lightship access areas will likely produce few discernable impacts to sea turtles in Georges Bank region, as compared to the status quo, because of the location of the access areas. While there are now documented sea turtle interactions in the scallop fishery on Georges Bank, takes have thus far been relatively rare events as a result of turtle distribution as well as their habitat preferences, especially during the colder months of the year.

With respect to potential shifts in fishing effort to the Mid-Atlantic as a result of the Georges Bank area access measures, the proposed action modifies the Georges Bank area schedule such that the Elephant Trunk Area is managed as a controlled access area with a precautionary trip allocation of 5 in 2007. The status quo would result in 9 trips, and accordingly could result in greater negative impacts to any turtles in the ETA if effort increases and concentrates there in months when turtles are present. No action would allow the ETA to open to fishing with open area DAS with even greater potential risks to sea turtles in the area if predictions of very high scallop biomass are correct and if effort shifts to harvest those scallops.

Contingency Alternative (proposed action)

The contingency option may be considered or employed depending on the outcome and/or interpretation of a court decision on Framework Adjustment 16/39 and Amendment 10. This measure

restricts the area available for rotational access in Closed Area I to the sliver that remains undesignated as a Habitat Closed Area by either Amendment 10 or Amendment 13 Essential Fish Habitat closures. Additionally, vessels would be permitted to take an additional trip into Closed Area II as opposed to Closed Area I. For the same reasons stated above, the shifts in trips by area on Georges Bank would have very little effect on sea turtles, particularly during trips taken during the December through April period (Murray 2005).

5.1.3.2.1 Adjustments when the yellowtail flounder catch reaches 10 percent.

Several alternatives are considered if the catches of yellowtail flounder on Georges Bank access area trips reach the 10% TAC limit and the access areas close as a consequence. Currently, to compensate vessels that have not taken their authorized trips, DAS, up to a maximum of 24, are added to a vessel's open area DAS allocation. Presently, the regulations do not specify what happens under this scenario in 2007 or what happens if the controlled access area allocations change --- the action contemplated in Framework Adjustment 18.

Several of the alternatives under consideration in the action would increase open area DAS and thus increase the potential for scallop fishery interactions with turtles if the additional DAS were used in times and places where there is an overlap. About 62 percent of this fishing time is projected to occur in the Georges Bank region in 2006 and 2007 (assuming the Hudson Canyon Area is under restricted access and the Delmarva area is closed in 2007), providing some information about the effort shift and indicating about 38 percent of the effort will occur elsewhere, including the Mid-Atlantic.

In the preferred alternative, limited access vessels with unused Georges Bank access trips would have their open area DAS allocations increase by a prorated amount that is calculated to achieve an equal amount of scallop mortality per DAS. While scallop fishing effort is not expected to increase in this case, the impacts on turtles could be potentially negative if effort shifts to areas in the Mid-Atlantic. This scenario is dependent on the season in which such a shift might occur. Observed trips discussed in Murray (2004a and 2005) indicate that takes have occurred from June through October, while turtles are known to occur in the Mid-Atlantic as early as May and as late as November (see Section 4.0). Closure of the Georges Bank areas at other times of the year may result in less impacts if the effort shifts outside of the May-November period.

The status quo described above is expected to increase scallop fishing effort by allowing vessels to fish up to 24 open area DAS in 2006 and 2007, particularly because open area trips could harvest more than the 18,000 pound trip limit that would have otherwise applied to the access area trips, and given that the length of trips could increase because scallops are smaller in the open areas than in the access areas. The same rationale relative to effort and shifts to the Mid-Atlantic discussed above would apply. The same holds true for the alternative that would allocate an equal number open area trips with an 18,000 pound possession limit for each trip not taken prior to the areas closing. Both of these scenarios would result in effort increases and potential negative impacts to turtles in the Mid-Atlantic during the May-November period, relative to the preferred alternative

This is not the case with the alternative in which the Regional Administrator determines that the scallop fishery is unlikely to have a yellowtail flounder catch that will reach the 10% TAC cap once all the initial maximum number of trips are taken and consequently raises the minimum number of trips in the access areas. Effort would remain concentrated in the Georges Bank areas with no fishing shifts to open areas. Risks to sea turtles exist on Georges Bank, as noted earlier, but to date appear far less than in the Mid-Atlantic, based on observed interactions as discussed in Section 4.0.

5.1.3.3 Hudson Canyon area rotation measures (Section 3.3.1.3)

During the 2006 and 2007 fishing years, no new or additional Hudson Canyon Area trip allocations would be made and the area would be closed to fishing using open area DAS. The HCA, however, would continue as a controlled access area to allow vessels with unused 2005 HCA trips to take them during the 2006 and 2007 fishing years. Vessels with unused broken trips during 2005-2007 also would be able to take compensation trips there at any time before the end of the 2007 fishing year. The HCA boundaries would dissolve on February 29, 2008, opening the HCA as a regular scallop fishing area where scallop vessels would use open area DAS. If new strong year classes appear, area boundaries would be redefined based on the future scallop resource distribution.

The preferred alternative of keeping the HCA available in 2006 and/or 2007 for unused 2005 trips could have the effect of spreading out effort over time, possibly reducing the risk sea turtles interactions in the area. Both the No Action and Status Quo measures could result in uncontrolled open area scallop fishing in the HCA. Tow times for smaller scallops could be longer adding effort that could negatively impact sea turtles. Given documented turtle interactions in the area during the June through October periods between 2001 and 2004, increased risks are possible, relative to the preferred alternative, without controls on fishing effort.

5.1.3.4 Elephant Trunk Area (ETA) rotation measures (Section 3.3.1.4))

5.1.3.4.1 Trip allocations and set-asides.

The Elephant Trunk Area (ETA) has been closed to scallop fishing since July 2004 to protect two very strong year classes until they reach a size that will produce high yield per recruit and optimum yield. Using precautionary trip allocations and set-asides relative to the status quo, the preferred alternative would reduce the initial TACs, set asides, and allocations by about 50%. The maximum number of trips that could be authorized is estimated to be 5 trips per vessel. The status quo calls for 9 trips per limited access vessel and would increase general category effort as well, with consequent potential negative impacts to turtles relative to the preferred alternative as a result of increased fishing effort in the area.

5.1.3.4.2 Reopen the Elephant Trunk area on January 1, 2007 or March 1, 2007.

The preferred alternative to reopen the ETA to controlled access fishing on January 1, 2007 could help to spread out fishing effort earlier in the year when impacts to sea turtles would be less because of their preference for warmer water temperatures and the fact that scallop fishing can and does occur on a year round basis in the Mid-Atlantic. The alternative to reopen on the ETA on March 1, 2007 may have similar advantages, although it spreads effort out over fewer months. Impacts may not be altogether different, however, because turtles are not expected in the Mid-Atlantic in any numbers during the first four months of the year. They have been documented to occur in the Mid-Atlantic principally from May through November (see Section 4.0).

5.1.3.4.3 Seasonal closures to reduce the risk of potential interactions with sea turtles in the ETA

During the 2007 fishing year, one alternative would close the ETA to scallop fishing during June 15 to November 14. Limited access and general category vessels would then take authorized trips to the area during March 1 to June 14, 2007 and from November 15, 2007 to February 29, 2008. Closing the ETA during this season could provide benefits with respect to reducing the potential risk of interactions

with sea turtles within the area, since the ETA would be closed to scallop fishing during the months when documented interactions have occurred in the Mid-Atlantic region. During 2003 to 2004, observers documented takes as early as June and as late as October. It should be noted, however, that such a closure does not ensure an overall reduction in turtle interactions, particularly if effort is displaced into the margins outside of the closure area and if turtles are present there in any numbers as opposed to inside the ETA. Further, Given the expected high biomass projected for the area, concentrations of effort over a shorter period of time could have unintended negative consequences for sea turtles when and if that effort occurs at the same time turtles are present in the ETA.

“Chain mats” may provide a way of mitigating turtle interactions in a more comprehensive manner if the gear modification is approved by NOAA Fisheries. Acknowledging work initiated by the scallop fishing industry as an important first step in reducing interactions in dredge gear, the agency published a proposed rule on May 27, 2005. If approved, the rule would require all scallop vessels with a federal scallop permit (limited access and general category) using scallop dredge gear, regardless of dredge size, to install ‘chain mats’ on dredges from May 1 to November 30. The Council is on record as supporting this gear modification. The position was adopted in light of the variability in the timing of interactions and the breadth of turtle distribution, as well as the fact that takes are region-wide throughout the Mid-Atlantic (Murray 2005). Further, as stated in Section 4.0, interactions are now documented on Georges Bank, making a gear solution more desirable as a conservation measure.

The modified scallop gear has been demonstrated to be effective in preventing sea turtles from being captured in dredges during sea trials as discussed in the proposed rule and associated Draft Environmental Assessment, although questions remain about the how and why turtles might be interacting with scallop dredges while the gear is being towed. Better, more systematically collected information relative to sea turtle abundance, particularly loggerheads, as well as foraging, migration, temperature preferences and other behavior could lead to a better understanding of fishery interactions and the development of tools to address the issue.

An additional alternative would require the ETA to be closed to scallop fishing during July 15 to October 31. A shorter closure than the alternative described above, it would give vessels a longer period in which to take their ETA trip allocations, as compared to the above alternative above, reducing potential crowding during the access period and possibly negative impacts if concentrations of fishing effort overlap with sea turtles inside the ETA. It is still precautionary relative to potentially reducing sea turtle interactions in that the measure would close the ETA during most of the late summer and early fall months when takes have been observed there (August, September, and October in 2003 and 2004. Also see section 4.0 and Murray 2005) and in the former Hudson Canyon Area that has now been incorporated into the ETA. The same concerns discussed in the first alternative above apply here, however. The closure does not ensure an overall reduction in turtle interactions, particularly if effort is displaced into the margins outside of the closure area and if turtles are present in greater numbers there than inside the ETA.

The alternative to close the ETA to scallop fishing from September 1 to October 31 to protect sea turtles would remove scallop fishing effort during a period when the majority sea turtle interactions with scallop dredges have occurred in the ETA (Table 51). Specifically, the closure could provide protection for sea turtles within the ETA during September and October when interactions in the ETA were observed in 2004 and 2004. Again, distribution and abundance of turtles is not consistent across years and such a closure would reduce takes of animals present only inside the area. It does not account for potential increased risks if effort shifts outside of the ETA and turtles are present both inside and outside of the ETA in equal numbers, nor does the closure ensure an overall reduction in takes if turtles are not inside the ETA during the closure period.

Allowing limited access and general category scallop vessels to take trips at any time during the fishing year, (with general category vessels subject to a closure when their trips reach the defined limit) would provide the most flexibility for fishermen to determine when to take Elephant Trunk Area trips. It would not offer any potential reductions in the risk of turtle interactions with sea scallop gear unless a gear modification solution is approved. This would occur only if the proposed chain mat requirement is published as a final rule.

Under the No Action alternative, the ETA would re-open to scallop fishing on March 1, 2007 with open area scallop fishing rules. The associated catch and fishing effort would be pooled into the open area DAS allocations and could result in negative consequences to sea turtles if the expected high levels of fishing effort in the ETA are realized due to the very high percent of overall scallop biomass and if access is not controlled. Similarly, it would not offer any potential reductions in the risk of turtle interactions with sea scallop gear unless a gear modification solution is approved.

Overall, it is difficult to predict how any of the proposed seasonal closures will affect fishing behavior and consequently sea turtle interactions, making the impacts of the closure periods difficult to predict. For example, a number of Mid-Atlantic vessels that are geographically limited may fish in the open areas of the region resulting in the potential negative impacts noted in the above discussions. However, during any of the proposed ETA closure periods, vessels from New England and some Mid-Atlantic vessels could elect to fish their open area DAS in the New England region where catch rates are expected to be higher. Further, Mid-Atlantic as well as New England limited access vessels could use their Georges Bank access area trips during any of the proposed ETA closure periods under consideration since each occurs during the Georges Bank access periods. Even considering the recent documentation of takes in the Georges Bank area, historical observations overall indicate that it is not a preferred sea turtle habitat, particularly in the cooler months (Shoop and Kenney 1992). Additionally, if turtles are present in the ETA during the proposed closure periods, a closure to scallop gear could shift effort to months when they are less abundant, providing potential benefits, particularly if an effort shift to adjacent or other areas with equal or greater concentrations of turtles does not materialize.

5.1.3.5 Procedures to adjust Elephant Trunk Area allocations (Section 3.3.1.5)

Depending on whether scallop biomass is either higher or lower than projected in the ETA area, this action would allow the Regional Administrator to adjust trips upward or downward according to the procedure outlined in the Framework 18 document. A downward adjustment in ETA trip allocations could reduce potential interactions between scallop gear and sea turtles thus providing greater benefits relative to the status quo. If upward adjustments are permitted, interactions with turtles could increase if fishing effort increases in times and places where turtles are present. Another possible scenario would allow the number of trips to be reduced only, resulting in a fewer negative impacts than is anticipated for the ETA under any of the other trip allocation alternatives for the ETA. Benefits would appear to be positive, effort shifts to open areas notwithstanding.

5.1.3.6 Delmarva Area Rotation Closure (Section 3.3.1.6)

Following observations of a high abundance of two-year old scallops in an area south of the Elephant Trunk Area during the recently-completed 2005 survey, the PDT recommended closure of an area encompassing the scallops. Since these scallops will not become vulnerable to scallop dredges until early 2007, the Scallop PDT further recommended closure of a new "Delmarva" rotation management area when the Elephant Trunk Area re-opens to scallop fishing in 2007. Two alternatives, in addition to the status quo, are under consideration: 1) to close the area when controlled access scalloping is allowed

to begin in the ETA (on either January 1 or March 1, 2007; and 2) to close the area on September 1, 2006 to prevent small scallops from being caught with scallop trawl gear. Under the status quo, the area would be open to scallop fishing during 2006 and 2007.

To close the area in either January 1 or March 1, 2007 when the ETA opens versus September 1, 2006 may provide slightly fewer benefits to sea turtles. The difference, however, is only an additional three months of potential reduced risk (during September 1, 2006 through November 2006). During the remaining period, December through April, turtles are largely absent from the Mid-Atlantic areas. Because of the limited differences in the closure timeframes and the one time occurrence of this measure, few discernable differences in outcomes of the alternatives are likely to occur relative impacts on to sea turtles.

A closure of the Delmarva area, versus the status quo with no new closure, could provide benefits to sea turtles by significantly reducing risks of interactions from both dredge and trawl gear. But there are risks associated with this closure as well. Depending on the alternatives selected by the Council, a scenario could occur in which the new Delmarva rotation area is closed, the initial ETA allocation is 5 trips per vessel, and the Hudson Canyon Area is under restricted access in 2007. The discussion in Section 5.2.2.6 (Economic Impacts) is of interest because it maintains that 140 out of 292 full-time scallop vessels fished only in the Mid-Atlantic in 2004. On average, these vessels derived nearly 23 percent of their scallop landings from statistical area 626, most of which will be closed to fishing in 2007 as part of the Delmarva closure.

If effort displacement does occur, it could result in increased and concentrated open area fishing in the few places in the Mid-Atlantic available outside of the three access areas (Map 5). If scallop effort overlaps in open areas where turtles are more abundant relative to the closed and controlled access areas, greater rates of interactions between turtles and the scallop fishery could occur than if effort were spread out over a larger area, i.e. if the Delmarva area remains open. Some of these vessels, however, could compensate for lost fishing time in the Delmarva area with ETA trips in 2007. The status quo would afford few if any benefits to turtles present in the area because it would be subject to open access fishing. Further, effort would be occurring on small scallops that could result in longer tow times and more days fished to harvest enough scallops to make a profitable trip.

5.1.3.7 Open Area Management (Section 3.3.2)

5.1.3.7.1 DAS Allocations.

Based on the PDT recommendation that open area DAS not exceed 20,000, the preferred alternative (coupled with the inclusion of the PDT recommendation to close the DMV in 2007 when the ETA opens as a controlled access area) calls for 52 open area DAS in 2006 and 51 in 2007. The measure results in an increase in open area DAS when compared to 42 DAS in 2004 and 40 DAS in 2005. The increase is possible because of the scallop rebuilding that has occurred over the past several years in the open areas.

Table 26 identifies the range of estimated allocations and projected DAS use in open scallop fishing areas. Allocations per vessel are contingent on the choices of alternatives for area rotation. The no action alternative would produce a 67/62 DAS, while the status quo would result in 67/19 DAS. Nearly all the alternatives presented result in increases in open area DAS, possibly resulting in potentially greater negative impacts if these open days are used in the Mid-Atlantic areas when sea turtles are seasonally abundant. This is particularly true in 2007 when the DMV area may close and if the ETA becomes a

controlled access area. The preferred alternative allows fishing mortality targets to be achieved with only a modest increase in open area DAS in 2006 and 2007 relative to other alternatives, and is accompanied by closures and restricted area access measures that may produce attendant benefits to sea turtles (with the caveats discussed earlier).

5.1.3.7.2 DAS Administration and monitoring

Because this measure is administrative and does not result in effort increases or shifts, but allows the accounting of 2006 DAS if implementation of Framework 18 occurs after the start of the 2006 fishing year, it is not expected to result in any impacts to sea turtles inhabiting the management unit.

5.1.3.8 Limited Access Crew Limits (Section 3.3.3)

In addition to the status quo (up to 7 persons on a limited access vessel and up to 5 on a small dredge permit), Framework 18 considers allowing limited access vessels on a controlled access area trip (for example to Nantucket Lightship Area, Closed Area I, Closed Area II, and the Elephant Trunk Area) to carry up to 8 persons, and up to 6 persons for vessels issued a small dredge limited access permit. In addition, this action considered, and the Council selected as the proposed action, an alternative that would eliminate the crew restriction all together. Both measures will likely increase the amount of fishing time per DAS, but in controlled access areas the catches are controlled by a possession limit.rips could therefore be shorter in duration, but fishing time per day is expected to increase. Therefore, changes in overall fishing time (while difficult to measure), are not expected to change much overall, thus impacts on protected species compared to the no action are minimal.

5.1.3.9 Other Measures (Sections 3.3.4, 3.3.5, 3.3.6, and 3.3.7)

There appear to be few if any measurable impacts to sea turtles associated with eliminating the trip exchange deadline, allowing equal exchanges of controlled access area trips between vessels, and an extension of the compensation trip deadline associated with the broken trip exemption program.

Eliminating the trip exchange deadline will simply allow vessels a greater period of time to make adjustments. There do not appear to be any implications associated with compliance and monitoring and the measure will not increase fishing effort beyond what is already allocated for achieving optimum yield. Impacts to threatened and endangered sea turtles are expected to be neutral because of the administrative nature of the measure.

The exchanges of controlled access area trips between vessels preserves the amount and location of controlled access area trips that may be taken by the scallop fleet. Transfers of area access trips between areas will not have meaningful impacts to sea turtles because the number of total trips in each controlled access area will remain the same; only the vessels themselves will change. On the other hand, exchanges of access area trips and open area DAS could have biological implications, particularly if the transfers occur so that a more efficient and powerful vessel receives open area DAS in exchange for access area trips. Limiting transfers to within permit categories with a ratio that is set to achieve an equal level of average catch in numbers will help mitigate this potential effort increase in the open areas and consequent negative impacts to sea turtles.

A 60-day extension of the ability for a vessel to take a compensation trip for a broken trip at the end of the fishing year is unlikely to have negative consequences for turtles. However, if the area where the compensation trip is authorized is closed at the beginning of a fishing year and re-opens later in the

year, there could be some negative implications associated with potential increases in fishing during turtle high use periods in some geographic areas.

The alternatives considered for changes in the research set-aside program are unlikely to have more than a marginal impact. The impacts associated with allowing combined compensation/research trips to take place in closed areas will depend on how much research takes place, and where and when the trips are taken. Since only a portion of the 2% TAC might be used in this way, the overall effects are expected to be low, but problems might arise if a substantial part of the 2% TAC set aside is allocated to research being conducted in a small area in the Mid-Atlantic during June through October. Other proposed changes in the research set-aside are likely to have positive indirect benefits arising from better research.

5.1.4 Impacts on Essential Fish Habitat

The Status Quo alternative is a set of measures that achieve the prescribed fishing mortality targets in Amendment 10. The projections also show that the re-calculated TAC consistent with an $F=0.20$ target would allow for an allocation of three access area trips, or 36 DAS in 2006 (1 trip in Closed Area I, and 2 trips in the Nantucket Lightship Area) and two trips in Closed Area II and one trip in the Nantucket Lightship Area in 2007. See Table 3 for a comparison of allocated DAS for full-time vessels under the No Action and Status Quo alternatives. The Elephant Trunk Area would be re-opened as a controlled access area in 2007 with an allocation of 9 full-time trips (72 DAS), with a pro-rata share going to part-time and occasional vessels. No set-aside or limit for vessels fishing under general category rules, but a three percent set-aside would apply for funding scallop related research and observers. Thus, the total DAS allocation for a full-time vessel would be 103 DAS (67+36) in 2006 and 206 (62+36+108) DAS in 2007. Like No Action, the regulations under the status quo would allow vessels to receive up to 24 open area DAS when Georges Bank areas close due to yellowtail flounder catches, 12 DAS for each unused trip. A two-percent set-aside would apply for vessels fishing in the Georges Bank access areas but like the Hudson Canyon Area, the Elephant Trunk Area would be open for vessels fishing under general category rules. A two-percent set aside for funding scallop related research and a one percent set-aside to fund an observer program would apply to all access areas, including the Elephant Trunk Area.

Under the No Action Alternative, full-time limited access scallop vessels would receive an allocation of 67 open area DAS in both 2006 and 2007. Part-time and occasional vessels would receive a pro-rata share of 40% and 1/12th, respectively. In addition, full-time vessels would receive an access area allocation of two trips and 24 DAS to fish in Closed Area I and the Nantucket Lightship Area, with a 40% and 1/12th pro-rata share going to part-time and occasional vessels. Thus, the total DAS allocation for a full-time vessel would be 91 DAS in 2006 and 2007. When Georges Bank access areas close due to yellowtail flounder catches, vessels would receive up to 24 extra open area DAS, 12 for each access area trip not taken due to the closure. And in 2007, the allocations from the most recent fishing year (i.e. 2006) would continue if the Council and NMFS failed to undertake and approve a biennial framework adjustment. Consistent with “No Action”, the Hudson Canyon Area and the Elephant Trunk Area would re-open for fishing by vessels using open area DAS.

5.1.4.1 Impacts of Area specific limits on fishing by limited access vessels

Option 1: To allocate total pounds per vessel rather than a specific number of trips with a possession limit.

Option 2: (Status quo) Maximum number of trips by area and scallop possession limits (Proposed Action)

Allocating by maximum trip and possession limit may cause more trips overall, but trip length is shorter, reducing bottom contact time and area swept. On the other hand, the allocation by pound alternative may result in longer trips, but fewer trips, thus the impacts on EFH are not expected to change under either alternative.

5.1.4.2 George’s Bank Area Access Schedule

5.1.4.2.1 Revise the Georges Bank area access schedule

Option 1: Revise the Georges Bank Area Access schedule

Option 2: (Status Quo) Continue FW16/39 rotation order

Option 3: Contingency schedule for rotation of Georges Bank Areas (Proposed Action)

	2006	2007
Revise GB schedule	5 trips (CAI, CAII, NLSP)	2 trips (CAI, NLSP) 5 trips in ETA for a total of 7 trips
Status Quo	3 trips (CAI, NLSP)	3 trips (CAII, NLSP) 9 trips in ETA for a total of 12 trips
Contingency Alt.*	5 trips (CAII, NLSP)	2 trips (CAI, NLSP) 5 trips in ETA for a total of 7 trips

* Proposed Action

Option 1: Revising the GB schedule alternative minimizes the fishing mortality in Closed Area II South, where above average small scallops have been observed. Parts of the multispecies closed areas on Georges Bank have been periodically opened for controlled scallop fishing since 1999. Habitat analysis of this option was included in the analysis of both Amendment 10 and Framework 16.

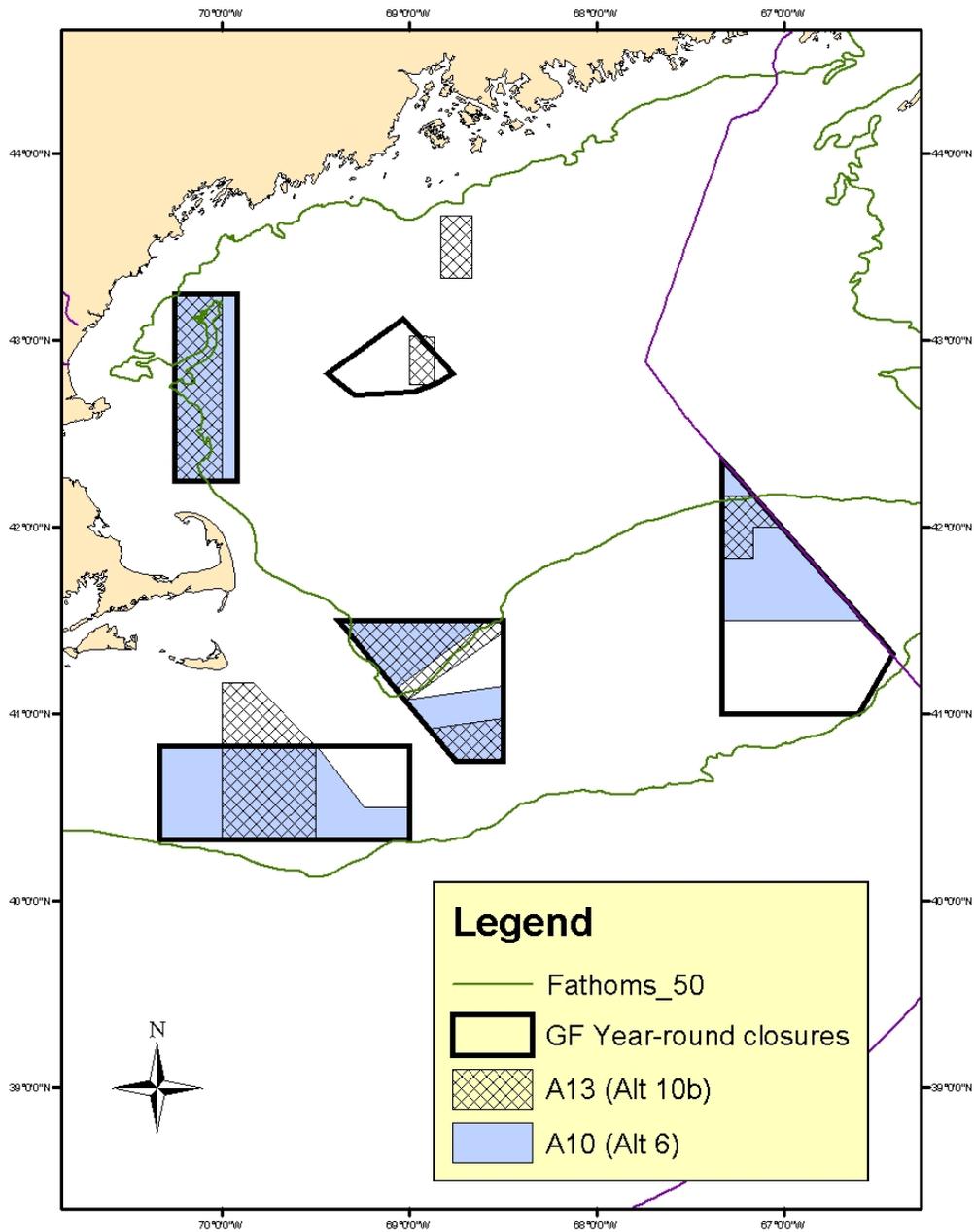
Option 2: The status quo rotation order from FW16/39 is the same as what was analyzed in Amendment 10. No additional habitat impacts beyond that baseline are expected.

Option 3: The Contingency Alternative is a result of the court’s decision in *Oceana v Evans* (8/2/05). Under the proposed action, five Georges Bank access trips would be allocated in 2006 with the Closed Area I access trip reassigned to Closed Area II. In 2007, two access trips would be allocated (one in Closed Area I and one in Nantucket Lightship).

The primary reason this alternative was selected is the result of the court’s decision in *Oceana v Evans* (08/02/05), which determined that EFH closures implemented under both Amendment 10 to the Scallop FMP and Amendment 13 to the Multispecies FMP apply to scallop vessels (Map 14). As a result of this decision, the Closed Area I access area would be restricted to a smaller area than had been analyzed in support of the Framework 18 Georges Bank access alternative. Because the proposed alternative prevents scallop fishing in the Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.

Due to a legal challenge to the Framework 16 measures, the Amendment 10 Essential Fish Habitat Closed Areas (HCAs), which were modified in Framework 16 to match the HCAs established in

Amendment 13 to the Northeast Multispecies FMP, are restored. The Amendment 10 HCAs differ from the Amendment 13 HCAs (as depicted in Map 14) and prohibit different gears. While Amendment 13 Habitat Closed Areas are closed to all bottom-tending mobile gears (Level 3), the Amendment 10 HCAs are only closed to scallop fishing gear. However, nothing proposed or considered in Framework 18 to the Atlantic Sea Scallop FMP will modify or impact either set of HCAs. Therefore, fishing with scallop gear is currently prohibited in both areas.



Map 14 Overlap of habitat closed areas established by Amendment 10 to the Atlantic Sea Scallop FMP (shaded) versus habitat closed areas established by Amendment 13 to the Northeast Multispecies FMP (hatched). Both areas are currently closed to scallop fishing.

5.1.4.2.2 Adjustments when yellowtail flounder catches reach 10% TAC limit

Option 1: Allocate additional open area DAS (at a prorated value) (Proposed Action)

Option 2: Allocate an equal number of open area trips with an 18,000 possession limit

Option 3: Initial allocations of half the trips in each area, raising them by October 1

Option 4: (Status Quo) Allow vessels to fish 12 DAS in open areas for up to two trips (None for 2007)

Option 1: Under current regulations, if the 10% yellowtail flounder TAC is reached and Georges Bank access areas close, vessels that have not taken trips are authorized to take up to two unused trips in the open fishing areas, but the regulations are silent about 2007. The proposed action allocates additional open area DAS for each trip not taken before areas close, but at a prorated value of DAS. Upon an area closure, each vessel with unused trips would be allocated a specific amount of additional open area DAS, based on this pre-defined ratio (See Table 18). This ratio has been calculated to allow the catch of an equal number of scallops from open areas as would have been caught by the unused trip taken in a given area, ensuring that the overall mortality target would be met. While this may cause an increase in fishing in open areas, because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.

Option 2: An initial allocation of equal number of trips will likely result in more bottom contact time in the open areas because trips may take longer to prosecute. More bottom contact time potentially translates into more impacts on benthic habitats in the open areas.

Option 3: An initial allocation of half the trips in each area would prevent any shift in effort into the open areas. However, significant uncertainty exists on the habitat impacts of when and where the second half of trips would be used. Therefore, the habitat impacts cannot be assessed.

Option 4: Allowing vessels to fish 12 DAS in open areas for up to two trips in 2006 but none in 2007 is consistent with what was analyzed in Framework 16. The impacts depend on the number of unused trips. If the average number of unused trips is less than or equal to two trips per vessel, then the Status Quo alternative is the least conservative and the proposed action is the most conservative (See Table 91 - Table 97).

5.1.4.3 Impacts of Hudson Canyon area (HCA) rotation measures

Option 1: Extend the duration of the HCA access program until February 28, 2008 (Proposed Action)

Option 2: (Status Quo) Reclassify the HCA as open to scallop fishing
(2005 Access trips would have to be taken before the end of the 2005 fishing year)

Option 1: The proposed action would extend the duration of the Hudson Canyon area access program to address the problem of reduced scallop biomass in the Hudson Canyon area in 2005 as compared to Amendment 10 predictions from 2003 survey results. It would allow limited access vessels with unused 2005 trips to delay taking them until 2006 or 2007 and close the area to vessels using open area DAS. No new Hudson Canyon Area trip allocations would be made, effectively closing the area to fishing except for 2005 trips that vessels carried forward for use in 2006 and 2007. This measure does not allocate any additional DAS or effort in the area but rather allows permit holders to fish the same

allocation over a longer period of time. As such, there will be no additional habitat impacts as a result of this measure.

Option 2: The status quo situation developed in Amendment 10 truncated the area in the south because small scallops again appeared in what is now known as the Elephant Trunk Area. New data suggests that scallop biomass in the Hudson Canyon area in 2005 is not as high as predicted by Amendment 10. Biomass was fished down faster than anticipated, and many vessels took sub-optimal trips in 2005 or chose to delay taking their 2005 access trips. Because this area was re-opened as a controlled access area in 2001, the impacts of the status quo on habitat would be minimal since it is an area that is already fished by scallop gear.

5.1.4.4 Impacts of Elephant Trunk Area (ETA) rotation measures

5.1.4.4.1 Initial trip allocations

Option 1: Precautionary initial trip allocations at $F=0.16$ (5 trips in 2007 including a 2% set-aside for research, 1% set-aside for observers, and 2% for general category vessels) (Proposed Action)

Option 2: (Status Quo): Allocations at a F rate of 0.32 (9 trips in 2007)

Option 1: This option (the proposed action) would allocate five trips for full-time vessels and a proportionate amount for part-time and occasional into the Elephant Trunk Area which is scheduled to re-open in 2007 as decided and analyzed in Amendment 10. This allocation is estimated to result in a fishing mortality of 0.16 which is decidedly lower than the status quo condition (0.32) and should be considered a precautionary measure. Selection of this measure is a more precautionary approach than what was enacted in Amendment 10. As such, the habitat impacts of this alternative are minimal.

Option 2: Under this option (status quo) Amendment 10 truncated access to the overall Hudson Canyon area in the south because small scallops again appeared and created what is now known as the Elephant Trunk Area. Under Amendment 10, nine (9) trips were allocated to this area and the impacts of this measure on EFH was mitigated for in that action with the creation of the Habitat Closed Areas as well as the 4-inch ring size gear modification. Therefore, this measure does not cause any more habitat impacts than what was anticipated in Amendment 10.

5.1.4.4.2 Re-opening date

Option 1: Re-open ET access area on January 1, 2007 (Proposed Action)

Option 2: Re-open ET access area on March 1, 2007

The proposed action would re-open ETA early on January 1, 2007, rather than on March 1, 2007 as planned under Amendment 10. Because the number of trips into ETA is fixed at 5, there are no recognizable impacts of this measure on EFH. Further, the difference in opening two months early (January 1 or March 1) will result in negligible habitat impacts.

5.1.4.4.3 Seasonal closure to potentially reduce sea turtle interactions in the Elephant Trunk Area

Option 1: Seasonal closure of ETA from June 15 to November 14 (5 months in length)

Option 2: Seasonal closure of ETA from July 15 to October 31 (3.5 months in length)

Option 3: Seasonal closure of ETA from September 1 to October 31 (2 months in length) (Proposed Action)

Option 4: (Status Quo) Year round access

During the 2007 fishing year, the ETA would be closed to scallop fishing for a two month period (September 1 - October 31) to possibly reduce sea turtle interactions during a period when takes of loggerhead turtles were observed in 2003 and 2004. The length of closure ranges from two to five months. The number of trips in this area is fixed which negates the impact of a three month range of closure options as the trips will be prosecuted at some time during the fishing year. As compared to the status quo, it can be argued that some areas will be able to recover slightly (See analysis in Amendment 10 Gear Effects Evaluation) but because dredge impacts recover on the order of six months or greater, anything less than year round closures is not considered beneficial to habitat. With respect to the proposed action, because the number of trips into ETA is fixed at five, there are no recognizable impacts of this measure on EFH. Further, because the sediment inside the ETA is largely sand, which recovers relatively quickly from the impacts of scallop gear, benthic impacts within ETA from scallop fishing are of relatively minor concern (see gear effects evaluation in Amendment 10).

5.1.4.5 Procedures to adjust ETA allocations

Option 1: Rulemaking procedure to adjust the number of ETA trips (Proposed Action)

Option 2: Framework Action to adjust the number of ETA trips

The Council approved a rulemaking process that would allow the Regional Administrator to adjust allocations in the ETA based on updated biomass projections. Because this measure sets up a process that allows the RA flexibility, it is largely administrative and would not have any direct impacts on EFH.

5.1.4.6 Impacts of Delmarva area rotation closure

Under the proposed action, in order to protect the high numbers of small scallops from the 2003 year class observed in the 2005 survey, the Delmarva rotational area would close in 2007 when the Elephant Trunk area opens (January 1, 2007). The Delmarva area would remain closed for three years until 2010 when the small scallops have grown sufficiently to be harvested. This would result in additional area closed to open area scallop fishing in the mid-Atlantic and could be considered positive for EFH in that area, as it would be closed to scallop fishing (bottom tending mobile gear) for three years. It is likely that the mid-Atlantic vessels will make a majority of their trips in the Elephant Trunk Area. Further, where as the sediment within the area is largely sand, which recovers relatively quickly from the impacts of scallop gear, benthic impacts from scallop fishing are of relatively minor concern (see gear effects evaluation in Amendment 10).

5.1.4.7 Impacts of Open Area Management

The options for open area management scenarios are presented in Section 3.3.2. The open area DAS allocations depend on which areas the Council recommends to open for controlled access (ie. ETA, Hudson Canyon and Delmarva). See Table 26 for a description of the open area management options considered in this action.

To determine the potential impacts of scallop fishing on essential fish habitat (EFH), an “area swept” calculation is used to approximate the expected change (increase or decline) in the area of bottom

contacted by scallop dredges. Although the use of area swept is a crude way to determine habitat impacts because it does not account for the fact that certain habitat impacts (e.g., damage or removal of attached epifauna) are most pronounced during the first pass of the dredge, and decline in severity with each subsequent pass, nor does it account for spatial shifts in fishing effort, it is a useful tool to understand the potential short- and long-term overall change in the extent of bottom contact by a gear that has been shown to adversely affect EFH in a manner that is more than minimal and less than temporary in nature (see Amendment 10 to the Atlantic Sea Scallop FMP and Amendment 13 to the Northeast Multispecies FMP).

Overall, it is estimated that the alternatives to the no action and status quo alternatives will increase long-term area swept from between 3% (DMV – 18K open DAS) to 14% (FW 18 – 30K DAS) from the status quo area swept projections. Depending on the alternative chosen, the long-term area swept will increase. However, it is impossible to determine where this new bottom-contact will occur and in what types of habitats. Additionally, while the full-time DAS resulting from the alternatives could range from 46-84 in 2006, the proposed action (DMV 20K open DAS in 2006 and 2007) would result in 52 full-time DAS in the open areas as opposed to the current (status quo) 67 DAS. It is important to note that while the DAS in the open areas will be reduced by the proposed action, none of the alternatives propose any access or changes to the Habitat Closed Areas established under Amendment 10 to the Atlantic Sea Scallop FMP or Amendment 13 to the Northeast Multispecies FMP.

Because a very large portion of the scallop biomass is estimated to be contained in the Elephant Trunk Area, it is likely that under the Status Quo alternative, which opens the Elephant Trunk Area in 2007, the long-term (2006-2020) area swept may be as low as 3,114 square nautical miles. This is due to vessels leaving the open areas and choosing to fish in the area with the highest biomass. Because the proposed action is not beyond the impacts analyzed and mitigated for in Amendment 10, the impacts to EFH will be minimal.

Based on the Council's decisions on controlled access area management, the proposed action would allow 20,000 open area DAS for 2006 and 2007 (see DMV – 20K open DAS 06-07 in Table 99). The specifications associated with 20,000 open area DAS translates (based on the number of permits issued) into 52 DAS for full-time vessels in 2006 and 51 DAS in 2007. Part-time vessels would be allocated 21 DAS in 2006 and 20 DAS in 2007, and occasional vessels would receive 4 DAS for both years. A higher open area DAS use may be expected to cause over-harvesting of the open areas and more severe habitat impacts from increasing area swept. The decision by the Council to limit the open area DAS to 20,000, whether or not the Delmarva area is closed to fishing in 2007, or whether or not the Hudson Canyon area remained classified as a controlled access area in 2006 and 2007, will result in slightly increased habitat impacts in the open areas but not beyond the range analyzed in Amendment 10. Overall, it is estimated that the proposed action (DMV – 20K open DAS in 2006 and 2007) will increase long-term area swept approximately 7% as compared to the status quo. However, it is impossible to determine where this new bottom contact will occur and in what types of habitats. It is important to note that the proposed measure does not propose any access or changes to the habitat closed areas.

Table 99. Projected Area Swept for Rotational Area Management Alternatives

Management Alternative	Projected Long-Term Area Swept (square nautical miles)	Projected Limited Access DAS Use (2006 and 2007)	Full-Time Open Areas DAS (2006 and 2007)
No Action	2,170	30056	67
		35166	67
Status Quo	3,114	30,058	67
		30,146	62
FW 18 – 15K open DAS	3,255	24,825	36
		40,551	72
FW 18 – 20K DAS open DAS	3,344	29,670	52
		39,566	69
FW 18 – 24.7 open DAS	3,438	34,243	67
		39,312	68
FW18 – 30K open DAS areas	3,558	39,459	84
		38,856	67
FW 18 – 2Yr HCA restriction	3,400	29,591	52
		40,166	71
DMV – 20K open DAS (06 only)	3,522	29,591	52
		42,316	78
DMV – 20K open DAS* (06-07)	3,333	29,591	52
		34,075	51
DMV – 18K open DAS	3,233	27,737	46
		32,095	45

* Proposed Action

5.1.4.8 Impacts of Limited Access Crew Limits

Option 1: Eliminate the 7 person crew limit (5 for small dredge vessels) on controlled access area trips (Proposed Action)

Option 2: Raise the crew limit from 7 to 8 for limited access vessels and 5 to 6 for small dredge vessels

Option 3: (Status Quo) Continue 7 person crew limit (5 for small dredge) on all limited access vessels

Option 1: This option (the proposed action) eliminates the 7 person crew limit (5 for small dredge vessels) on controlled access area trips and the limited access vessels on a controlled access area trip would have no limit on the number of crew onboard. Larger crew sizes will reduce overall trip length and if LPUE remains constant, there is no net increase in ‘bottom contact time’; therefore, fishing impacts on benthic environments and finfish bycatch are expected to be the same. Therefore, no additional habitat impacts are expected from this measure so long as fishing behavior does not change in terms of size selectivity.

Option 2: This option is expected to increase efficiency of the crew and shorten the trip’s duration but not as much compared to Option 1 which eliminates crew limits all together. No addition habitat impacts are expected from this measure.

Option 3: This option retains the status quo size limit, no change in habitat impacts.

5.1.4.9 Trip Exchange Deadline

Option 1: Elimination of the June 1 deadline (Proposed Action)

Option 2: (Status Quo) Require trip exchanges to be completed by June 1, or 90 days after allocations are made

This measure is primarily administrative and therefore, relative to the status quo, no impacts to essential fish habitat are expected.

5.1.4.10 Controlled Access Area Trip Exchanges

Option 1: One-to-one exchanges of 2006 GB access area trips and 2007 ETA trips with another vessel (Proposed Action)

Option 2: Exchanges of 2006 GB access trips and open area DAS with another limited access vessel

Option 3: One-to-one exchanges of GB access trips and unused 2005 Hudson Canyon area trips to be used in 2006 (Proposed Action)

Option 4: (Status Quo) One-to-one exchanges of controlled access area trips for other access areas open to fishing during the same fishing year (Proposed Action)

The proposed action includes three measures to liberalize the trip exchange program (Options 1, 3 and 4) which include one-to-one exchanges of 2006 GB access area trips and 2007 ETA trips; one-to-one exchanges of GB access trips and unused 2005 Hudson Canyon area trips to be used in 2006; and one-to-one exchanges of controlled access area trips for other access area trips open to fishing during the same fishing year (status quo). The one-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.

However, Option 2 (not selected) which involves exchanges in open area DAS have the potential to increase fishing effort and scallop mortality in open areas by some amount. And since catches are unlimited in open areas, these exchanges could have the potential to increase fishing power and cause overfishing in open areas, particularly if the transfers involve shifting effort to open areas by more efficient and powerful vessels. Specific impacts on EFH from the alternative that include (not selected) are difficult to assess because it is unknown where the open area effort would be.

5.1.4.11 Broken Trip Exemption Program

Option 1: 60-day carry forward of compensation trips (Proposed Action)

Option 2: (Status Quo) no carry forward of compensation trips

The proposed action (Option 1) requires an additional reporting requirement for broken trips, which allows vessels that return to port on a controlled access area trip to catch the remaining portion at a later date on a compensation trip. The proposed measure is very similar to the existing open area DAS carry forward regulation and is likely to have minimum biological effects over the long term. However, the short-term effects on EFH are unclear and may need to be considered during framework adjustments that re-specify future TACs.

5.1.4.12 Research Set-Aside Program

Two percent of controlled access area TACs and two percent of open area DAS are set-aside, i.e. not allocated to the fishery, for funding scallop-related research through compensation trips. The measures under consideration include the compensation and disposition of research set-aside DAS. Because these measures are largely administrative, no habitat impacts are expected. It should be noted that Amendment 10 intended for a portion of the research set-aside to be used to conduct habitat-related research. To date, this has not occurred.

5.2 Economic Impacts

5.2.1 Economic impacts of the rotation area alternatives

The section provides a cost/benefit analysis of the area rotation alternatives, *including the no action alternative*, proposed by the Council through Framework Action 18 to the Sea Scallop FMP. The regulatory guidelines require that the economic impacts of the proposed options be compared relative to the impacts likely to occur if ‘no action’ is taken. No action here refers to continuation the Amendment 10 rotation order with Hudson Canyon, Elephant Trunk (ETA) areas fully open and no closures in Delmarva (DMV) combined with a total open area DAS of 24700 days. Status quo scenario is based on the same assumptions except that ETA will be open as an access area in 2007. The cost/benefit analyses reported in this section estimate the combined impacts of the area rotation area alternatives including controlled access area allocations, modified Elephant Trunk reopening and Groundfish closed area access, extended Hudson Canyon access program, area closures (Delmarva), and open area DAS allocations as shown in Table 100. The distributional impacts of Delmarva closure options and the impacts of other individual measures such as area specific quotas and elimination of crew limits for controlled access, and controlled access area trip exchanges are discussed in Section 5.2.2 through Section 5.2.6. The economic impacts are presented in Table 101 to Table 106 using an updated estimate of prices, revenues and total net benefits taking into account unusually large increase in scallop prices during 2005, from an average price of \$4.85 per pound in 2004 to over \$9 per pound since summer. The cost estimates are also updated to reflect the recent increase in fuel prices. Further discussion on the price and cost estimates is provided in Section 5.2.1.5 below.

5.2.1.1 Summary of economic impacts

The results of the cost/benefit analysis could be summarized as follows:

- The aggregate economic impacts of the proposed measures are shown following Tables (Table 100 to Table 107) with the scenario titled “*DMV- 20K open DAS in 2006-07*”. Although biological simulations for this scenario included revised Georges Bank access schedule (previously preferred alternative) as shown in Table 100, the results with the proposed contingency schedule are expected to be similar because the total number of access area trips will stay the same (see Section 5.2.2.2 for more discussion). Over the two year period from 2006 to 2007, the proposed measures, including Georges Bank, Hudson Canyon (HCA) and Elephant Trunk area rotation measures, Delmarva (DMV) closure and 20,000 open area DAS, are expected to have positive impacts on total scallop revenue, on producer and consumer surpluses and on total economic benefits (Table 101 to Table 104). Average annual scallop landings during 2006-07 are estimated to increase to 74.8 million lb. with the proposed measures from an average of 70.8 million lb. for no action, and average ex-vessel price to decline from \$7.9 per pound for no action to \$7.4 per pound with the proposed measures. As a result, total scallop revenue will increase slightly by 1.06% and cumulative economic benefits by 2.95% during 2006-07 compared to the no action values (Table 101 and Table 103). Because total fishing costs are estimated to increase due to more access area trips with the proposed measures, there will be only a minimal increase in average producer benefits over the two year period from 2006 to 2007. The increase in consumer benefits will be larger due to higher landings and lower scallop prices. In terms of 1996 constant prices, the cumulative economic benefits, calculated as the sum of consumer and producer surpluses, are estimated to increase by \$30 million (\$34.4 million in 2004 prices) compared to the no action levels (Table 103).
- The short-term economic impacts of the alternative options are compared with the proposed measures in Table 101 to Table 104. DMV closure option with 18,000 open area DAS result in

largest average revenue, \$552.6 million per year and the proposed measures with 20,000 open areas DAS rank second with \$551.4 million revenue compared to the other options as an average per year from 2006 to 2007 (Table 101). The FW18 rotation with 20,000 DAS rank third in terms of the average fleet revenues during the period 2006-07. The scallop revenue per year as (an average of 2006-07) is estimated to decline slightly for the rest of the alternatives compared to the no action alternative. The alternatives with higher fishing effort (i.e., DAS) and larger landings result in lower producer benefits but in larger consumer surplus due to lower prices with these options in the short-term (Table 102). Since total economic benefits are estimated as a sum of producer and consumer benefits and because consumer surplus exceed producer benefits for all alternatives, total benefits for alternatives with larger landings rank higher than alternatives with lower landings in the short-term. Table 102 shows, however, that all rotation options increase cumulative present value of total benefits by 1% to 6%, or by \$12 million to \$69 million (in 2004 dollars), compared to no action in the short-term, i.e., during 2006-07.

- The long-term economic effects of the proposed measures are estimated to be slightly negative on revenues (an average 1.27% decline per year) but positive on cumulative economic benefits (1.96% increase) over the twelve years from 2008-2019 (Table 105 and Table 106). The long-term impacts of the alternative area rotation and open area DAS management options are similar to the long-term impacts of the proposed measures, which is slightly negative on revenues but positive on total economic benefits. Average ex-vessel prices for 2008-2019 are estimated to be higher than the present levels, ranging from \$11.5 per lb. to \$11.9 per pound depending on the alternative, because of the assumed increase in disposable income by 1.4% per year. Since no action scenario results in higher price, \$12.4 per pound due to lower landings, revenues under this scenario would exceed the revenues for the proposed measures and alternative rotation area options depending on the assumptions regarding changes in export, imports, disposable income, consumer preferences and composition of landings by market size category in the future years as discussed in Section 5.2.1.5. Cumulative value of long-term benefits are estimated to increase by \$120 million in 2004 prices for the proposed measures compared to the no action (Table 106). The value of cumulative economic benefits for alternative options are estimated to range from \$41 million (*FW18 - 30K open DAS*) to \$135 million (*DMV - 18K open DAS*) in 2004 inflation adjusted prices for 2008-2019.

Table 100. Area Rotation Alternatives

Alternatives	Open area DAS per FT vessel	Controlled access area trips	Elephant Trunk	Hudson Canyon	Delmarva	Total DAS per FT vessel
No Action – 24.7K open area DAS in 2006 and 2007						
2006	67	2 trips in CAI & NLS (24 DAS)	Closed	Fully open	Open	91
2007	67	2 trips in CAI & NLS (24 DAS)	Fully Open	Fully open	Open	91
Status Quo -24.7K open area DAS in 2006						
2006	67	2 tin CAI, 1 t in NLS (36 DAS)	Closed	Fully open	Open	103
2007	62	1 t in CAI, 2 t in NLS (36 DAS)	9 trips	Fully open	Open	206
Framework 18 - 15K open area DAS in 2006						
2006	36	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	96
2007	72	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	156
Framework 18 - 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	112
2007	69	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	153
Framework 18 - 24.7K open area DAS in 2006						
2006	67	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	127
2007	68	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	152
Framework 18 - 30K open area DAS in 2006						
2006	84	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	Fully open	Open	144
2007	67	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	Fully open	Open	151
FW 18: 2Yr HCA restriction, 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	71	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Open	155
DMV closure – 20K open area DAS in 2006						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	78	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	162
DMV closure - 18K open area DAS in 2006 and 2007						
2006	46	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	106
2007	45	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	129
DMV - 20K open area DAS in 2006 and 2007 (Proposed Alternative)						
2006	52	1 CAI, 2 CAII, 2 NLS (60 DAS)	Closed	2005 trips	Open	112
2007	51	1 CAI, 1 NLS, 5 ETA (84 DAS)	5 trips	2005 trips	Closed	135

- The short- and long-term cumulative value of consumer, producer and net economic benefits are also shown in terms of 1996 dollars in Table 104 and Table 107 in order to comply with the guidelines issued by the Office of Management and Budget (OMB) to standardize the measures of benefits and costs of Federal regulations. The costs and benefits are slightly lower when expressed in 1996 dollars because of the increase in prices by 16.3% in 2004 compared to 1996 price level as measured by the GDP deflator.

5.2.1.2 Aggregate economic impacts in the short- term (2006-2007)

Table 101 shows that all rotation options, with the exception of the Framework 18 rotation with open area fishing effort at 15,000 DAS (FW18-15 K open area DAS), will result in larger landings compared to the no action and status quo scenarios in 2006. Even though prices will be lower due to the increased landings, total revenue under all options is estimated to slightly exceed no action revenue levels (Table 101). In 2007, however, the increase in landings to above 80 million lb. has a larger negative

impact on prices, resulting in lower revenue compared to no action for most alternatives. The Delmarva (DMV) closure options with 18000 and with 20000 open area DAS options, however, result in lower level of landings and higher prices compared to no action, resulting in a small increase in scallop revenue.

The price per pound is estimated to range \$6.4 to \$9.1 per pound in 2006 and from \$6.1 to \$7.5 in 2007 depending on the rotation area alternative, and slightly higher if they were converted to 2005 dollars. These values are lower, however, than the current price of scallops mostly due to the estimated increase in landings to close to or over 70 million pounds in 2006 and to over 80 million lb. in 2007 for most options (Table 101). Actual prices in the future could be different than these estimates due to the changes in the level of exports and imports, import prices, value of dollar, disposable income of consumers among other factors.

Over the two year period 2006-2007, DMV closure options with 18000 and 20000 open area DAS result in largest average revenue per year, over \$550 million per year, compared to the other options. The Framework 18 rotation with 20,000 DAS rank third in terms of the average fleet revenues during 2006-07. These three options maintain average landings and the prices at more stable levels in 2006-2007 by following a precautionary approach in terms of open area fishing effort combined with gradual fishing of Elephant Trunk area, and with closure of Delmarva area in the case of DMV closure options. The change in revenues for these options range from a 0.73% to 1.27% increase is quite small, however, as the percent decline in revenues are estimated to be minor for the other rotation options shown in the Tables. In addition, closure of Delmarva area starting in 2007 could have some negative impacts especially on some Mid-Atlantic boats, because this closure leaves a small area in Mid-Atlantic for vessels to fish their open area DAS allocations. The economic and social impacts of these closures are Section 5.2.2 and Section 5.3.

Table 101. Short-term economic impacts of area rotation options on landings, prices and revenues (in 2004 inflation adjusted prices) (proposed action shaded)

Fishing year	Alternatives	Landings (lb.)	Ex-vessel Price	Total Revenue (mill. \$)	% Change in Revenue from No action
2006	No Action	59.2	8.9	527.7	
	Status Quo	59.2	8.9	527.7	0.00%
	FW18 - 2 Yr HCA restriction	71.6	7.5	537.6	1.88%
	FW18 - 24.7K open DAS	74.9	7.2	536.0	1.57%
	FW18 - 15K open DAS	58.7	9.1	532.0	0.81%
	FW18 - 20K open DAS	67.4	8.0	538.0	1.94%
	FW18 - 30K open DAS	82.6	6.4	528.7	0.17%
	DMV - 20K open DAS in 2006	71.6	7.5	537.6	1.88%
	DMV - 20K open DAS in 2006-07	71.6	7.5	537.6	1.88%
	DMV - 18K open DAS in 2006-07	68.5	7.9	538.1	1.96%
2007	No Action	82.4	6.8	563.5	
	Status Quo	90.2	6.1	550.8	-2.26%
	FW18 - 2 Yr HCA restriction	87.4	6.3	552.9	-1.88%
	FW18 - 24.7K open DAS	82.8	6.7	558.6	-0.88%
	FW18 - 15K open DAS	88.4	6.2	550.9	-2.25%
	FW18 - 20K open DAS	85.0	6.5	556.0	-1.35%
	FW18 - 30K open DAS	80.2	7.0	561.4	-0.38%
	DMV - 20K open DAS in 2006	88.3	6.2	551.7	-2.10%
	DMV - 20K open DAS in 2006-07	78.0	7.2	565.2	0.29%
	DMV - 18K open DAS in 2006-07	75.7	7.5	567.1	0.62%
2006-2007	No Action	70.8	7.9	545.6	
	Status Quo	74.7	7.5	539.3	-1.17%
	FW18 - 2 Yr HCA restriction	79.5	6.9	545.3	-0.07%
	FW18 - 24.7K open DAS	78.9	6.9	547.3	0.31%
	FW18 - 15K open DAS	73.5	7.6	541.5	-0.77%
	FW18 - 20K open DAS	76.2	7.3	547.0	0.24%
	FW18 - 30K open DAS	81.4	6.7	545.0	-0.11%
	DMV - 20K open DAS in 2006	79.9	6.9	544.7	-0.18%
	DMV - 20K open DAS in 2006-07	74.8	7.4	551.4	1.06%
	DMV - 18K open DAS in 2006-07	72.1	7.7	552.6	1.27%

The economic impacts of rotation alternatives on producer and consumer surpluses and total economic benefits are presented in Table 102. The alternatives with higher fishing effort (i.e., DAS) and larger landings result in lower producer benefits but in larger consumer surplus due to lower prices under these options in the short-term. Producer benefits are calculated as a difference of total revenue and variable (operating) costs of fishing. Because total fishing effort (total DAS-used) is higher and LPUE is slightly lower for all alternatives compared to no action, operating costs are expected to be higher as well. Because total revenue for DMV closure options with 18,000 and 20,000 open area DAS is higher compared to no action, the cumulative value of producer benefits for these alternatives exceed slightly the producer benefits for no action. Since total economic benefits are estimated as a sum of producer and consumer benefits and because consumer surplus exceeds producer benefits for these scenarios, total benefits for options with larger landings rank higher than options with lower landings in the short-term. Table 103 shows, however, that all rotation options increase cumulative present value of total benefits by

1% to 6%, or by \$12 million to \$69 million, compared to no action in the short-term (2006-07) in terms of 2004 prices. The net economic benefits are also shown in terms of 1996 dollars in Table 104 in order to comply with the guidelines issued by the Office of Management and Budget (OMB) to standardize the measures of benefits and costs of Federal regulations. They are slightly lower, and range from \$10 million to \$69 million in 1996 dollars due the inflation during the period 1996-2004.

The impacts on employment measured by total crew days (Crew*DAS) would be positive if elimination of crew limit for controlled access areas does not reduce overall DAS. All alternatives allocate more DAS compared to no action during 2006 and 2007. However, the impacts on employment will be uncertain given that the proposed measures eliminate 7-men crew limit for the controlled access areas. On the one hand, the increase in the number of crew would lead to higher employment, on the other hand, with more crew the vessels would spend less DAS fishing in the controlled access areas, which could have a negative impact on employment measured by crew days. The social and economic impacts of this alternative are analyzed further in Section 5.2.2 and Section 5.3.

Table 102. Short-term economic impacts of area rotation options on producer, consumer and total benefits (in 2004 inflation adjusted prices) (proposed action shaded)

Fishing year	Alternatives	DAS	Operating costs* (mill. \$)	Producer Surplus (mill. \$)	Consumer Surplus (mill. \$)	Total Benefits** (mill. \$)	% Change in Total Benefits from No Action
2006	No Action	29,713	40.4	487.3	135.6	544.1	
	Status Quo	29,711	40.4	487.3	135.6	544.1	0.0%
	FW18 - 2 Yr HCA restriction	33,151	45.1	492.6	196.1	601.5	10.5%
	FW18 - 24.7K open DAS	35,698	48.5	487.5	212.8	611.7	12.4%
	FW18 - 15K open DAS	25,989	35.3	496.7	134.7	551.4	1.3%
	FW18 - 20K open DAS	30,983	42.1	495.8	175.4	586.3	7.8%
	FW18 - 30K open DAS	41,075	55.9	472.8	252.6	633.6	16.4%
	DMV - 20K open DAS in 2006	33,151	45.1	492.6	196.1	601.5	10.5%
	DMV - 20K open DAS in 2006-07	33,151	45.1	492.6	196.1	601.5	10.5%
DMV - 18K open DAS in 2006-07	31,239	42.5	495.6	180.9	590.8	8.6%	
2007	No Action	32,673	44.4	519.1	241.9	621.2	
	Status Quo	37,594	51.1	499.7	283.7	639.4	2.9%
	FW18 - 2 Yr HCA restriction	43,156	58.7	494.2	267.0	621.4	0.0%
	FW18 - 24.7K open DAS	40,076	54.5	504.1	242.5	609.4	-1.9%
	FW18 - 15K open DAS	41,353	56.2	494.6	272.3	626.0	0.8%
	FW18 - 20K open DAS	40,337	54.9	501.1	253.8	616.3	-0.8%
	FW18 - 30K open DAS	39,606	53.9	507.6	228.7	601.0	-3.3%
	DMV - 20K open DAS in 2006	45,373	61.7	490.0	272.2	622.2	0.2%
	DMV - 20K open DAS in 2006-07	36,877	50.2	515.0	217.8	598.2	-3.7%
DMV - 18K open DAS in 2006-07	34,836	47.4	519.7	206.0	592.3	-4.6%	

* Includes trip costs such as food, fuel, ice, water, oil and repair costs for gear.

Table 103. Short-term cumulative benefits compared to no action (in 2004 inflation adjusted prices)

Fishing year	Alternatives	LPUE (lb. per DAS)	Present value of Consumer Surplus (mill. \$)	Present value of Producer Surplus (mill. \$)	Present value of Total Benefits** (mill. \$)	Total benefits net of no action (mill. \$)	% Change in Total Benefits
2006-2007	No Action	2,257	315.9	849.4	1,165.3		
	Status Quo	2,193	350.0	833.5	1,183.5	18.2	1.56%
	FW18 - 2 Yr HCA restriction	2,087	389.2	833.7	1,222.9	57.6	4.94%
	FW18 - 24.7K open DAS	2,078	383.8	837.3	1,221.1	55.8	4.79%
	FW18 - 15K open DAS	2,195	339.9	837.6	1,177.5	12.2	1.04%
	FW18 - 20K open DAS	2,137	360.4	842.1	1,202.6	37.3	3.20%
	FW18 - 30K open DAS	2,012	407.3	827.3	1,234.6	69.3	5.94%
	DMV - 20K open DAS in 2006	2,047	393.4	830.2	1,223.7	58.4	5.01%
	DMV - 20K open DAS in 2006-07	2,133	349.1	850.6	1,199.7	34.4	2.95%
DMV - 18K open DAS in 2006-07	2,180	326.1	857.1	1,183.2	17.9	1.53%	

Table 104. Short-term cumulative benefits compared to action in 1996 prices (adjusted for inflation using GDP deflator)

Fishing year	Alternatives	Present value of Consumer Surplus (mill. \$)	Present value of Producer Surplus (mill. \$)	Present value of Total Benefits** (mill. \$)	Total benefits net of no action (mill. \$)
2006-2007	No Action	272	731	1,002	-
	Status Quo	301	717	1,018	16
	FW18 - 2 Yr HCA restriction	335	717	1,052	50
	FW18 - 24.7K open DAS	330	720	1,050	48
	FW18 - 15K open DAS	292	721	1,013	10
	FW18 - 20K open DAS	310	724	1,034	32
	FW18 - 30K open DAS	350	712	1,062	60
	DMV - 20K open DAS in 2006	338	714	1,053	50
	DMV - 20K open DAS in 2006-07	300	732	1,032	30
DMV - 18K open DAS in 2006-07	281	737	1,018	15	

5.2.1.3 Aggregate economic impacts in the long-term (2008-2019)

The cumulative value of the long-term economic benefits show the sum of present value of the benefits discounted at 7%. The long-term impacts of the rotation area measures are estimated to be slightly negative on revenues but to be positive on total economic benefits for all alternatives (Table 105 and Table 106). Those options with lower economic benefits in the short term, such as FW18-15K open DAS option, DMV closure options with 20,000 and with 18000 open area days provide larger benefits over the long-term by increasing scallop biomass and yield due to the more precautionary approach with the fishing mortality targets. Cumulative value of long-term benefits for 2008-2019 (total of 17 years) net of no action is estimated to range from \$41 million (FW18 – 30 K open area DAS) to \$135 million for DMV closure with 18000 open area DAS in 2004 inflation adjusted prices. Net economic benefits would range from \$35 million to \$116 million if they are expressed in terms of 1996 dollars (Table 107). Average

ex-vessel prices for 2008-2019 are estimated to be higher, over \$11 per lb., because of the assumed increase in disposable income by 1.4% per year (Table 105). Since no action scenario results in a higher price per pound, revenues under this scenario would exceed the revenues for rotation area options depending on the assumptions regarding changes in export, imports, disposable income, consumer preferences and composition of landings by market size category in the future years. Because total fishing effort (total DAS-used) is higher and LPUE is slightly lower for all alternatives compared to no action, operating costs are expected to be higher as well. As a result, producer benefits (difference of total revenue and variable (operating) costs of fishing) are slightly lower over the long-term with the proposed measures and alternatives compared to no action..

As with the short-term impacts, the long-term impacts of the proposed alternatives on employment as measured by total crew days (Crew*DAS) will be positive unless elimination of the 7-men crew limit for the controlled access areas significantly reduces overall DAS. All alternatives allocate more DAS compared to no action over the long-term, but the elimination of crew limit will reduce the trip length for the controlled access areas, thus could lower over DAS and employment. Overall impacts on the employment is uncertain at this time, however, since the increase in the number of crew for controlled access trips could also result in higher employment if this increase outweigh the negative impacts of reduction in DAS. Social and economic impacts of this alternative are analyzed further in Section 5.2.2 and Section 5.3.

Table 105. Long-term economic impacts of area rotation options on landings, prices and revenues (in 2004 inflation adjusted prices, assuming 1.4% increase in disposable income)

Fishing year	Alternatives	Landings (lb.)	LPUE (lb. per DAS)	Ex-vessel Price	Total Revenue (mill. \$)	% Change in Revenue from No action
2008-19	No Action	74.4	2,438	12.4	913.2	
	Status Quo	78.9	2,318	11.7	902.2	-1.20%
	FW18 - 2 Yr HCA restriction	78.9	2,320	11.7	903.2	-1.09%
	FW18 - 24.7K open DAS	77.7	2,307	11.9	904.5	-0.95%
	FW18 - 15K open DAS	78.9	2,313	11.7	902.9	-1.12%
	FW18 - 20K open DAS	78.3	2,309	11.8	903.7	-1.04%
	FW18 - 30K open DAS	77.1	2,305	11.9	905.2	-0.87%
	DMV - 20K open DAS in 2006	78.8	2,316	11.7	903.3	-1.08%
	DMV - 20K open DAS in 2006-07	79.8	2,319	11.6	901.6	-1.27%
	DMV - 18K open DAS in 2006-07	80.3	2,324	11.5	901.1	-1.32%

Table 106. Long-term present value of cumulative benefits compared to no action during 2008-2019 (in 2004 inflation adjusted prices)

Alternatives	DAS per year	Operating costs per year* (mill. \$)	Cumulative Present value of Consumer Surplus** (mill. \$)	Cumulative Present value of Producer Surplus** (mill. \$)	Cumulative Present value of Total Benefits** (mill. \$)	Cumulative benefits net of no action** (mill. \$)	% Change in Total Benefits
No Action	30,459	41	773	5,335	6,108		
Status Quo	33,874	46	968	5,228	6,196	87	1.43%
FW18 - 2 Yr HCA restriction	33,832	46	966	5,236	6,203	94	1.54%
FW18 - 24.7K open DAS	33,519	46	917	5,250	6,167	58	0.95%
FW18 - 15K open DAS	33,955	46	969	5,232	6,201	93	1.52%
FW18 - 20K open DAS	33,757	46	944	5,240	6,184	76	1.25%
FW18 - 30K open DAS	33,296	45	891	5,258	6,149	41	0.66%
DMV - 20K open DAS in 2006	33,857	46	964	5,236	6,201	92	1.51%
DMV - 20K open DAS in 2006-07	34,251	47	1,010	5,218	6,228	120	1.96%
DMV - 18K open DAS in 2006-07	34,398	47	1,030	5,212	6,243	135	2.20%

* Includes trip costs such as food, fuel, ice, water, oil and repair costs for gear.

** The values are discounted by 7% to estimate the present value of benefits.

Table 107. Long-term cumulative benefits compared to no action in 1996 prices (adjusted for inflation using GDP deflator)

Fishing year	Alternatives	Present value of Consumer Surplus (mill. \$)	Present value of Producer Surplus (mill. \$)	Present value of Total Benefits** (mill. \$)	Total benefits net of no action (mill. \$)
2008-2019	No Action	665	4,590	5,255	-
	Status Quo	833	4,497	5,330	75
	FW18 - 2 Yr HCA restriction	831	4,504	5,336	81
	FW18 - 24.7K open DAS	789	4,516	5,305	50
	FW18 - 15K open DAS	834	4,501	5,335	80
	FW18 - 20K open DAS	812	4,508	5,320	65
	FW18 - 30K open DAS	766	4,523	5,289	35
	DMV - 20K open DAS in 2006	829	4,505	5,334	79
	DMV - 20K open DAS in 2006-07	869	4,489	5,358	103
	DMV - 18K open DAS in 2006-07	886	4,484	5,370	116

5.2.1.4 Economic impacts of no action and status quo alternatives

No action refers to continuation the Amendment 10 rotation order with Hudson Canyon, Elephant Trunk areas fully open and no closures in Delmarva (DMV) combined with a total open area DAS of 24700 days. If the Council took no action, full-time limited access scallop vessels would be allocated 67 open area DAS in both 2006 and 2007. In addition, full-time vessels would receive an access area allocation of two trips to fish in Closed Area I and the Nantucket Lightship Area. Thus, the total DAS allocation for a full-time vessel would be 91 DAS in 2006 and 2007. The impacts of the no action were discussed above in Section 5.2.1.1 to Section 5.2.1.3 relative to the impacts of the alternatives described in Table 100. These impacts could be summarized as follows:

- Under the no action alternative, the landings will be less than the levels estimated for the proposed alternatives both in the short- and the long-term (Table 101 and Table 105). This is because no action allocates fewer trips to the access areas and a lower total day-at-sea compared to other alternatives.
- Because prices are estimated to be higher due to lower landings, revenues could be slightly higher with no action compared to revenues for some alternatives. On the other hand, lower landings and higher prices will reduce consumer benefits. As a result, total net benefits under no action will be less than the other alternatives as shown in Table 103 and Table 107 above both in the short-term (by \$12 million to \$69 million) and the long-term (by \$41 million to \$135 million).

The “Status Quo” alternative allows for a change in specifications to achieve the prescribed fishing mortality targets in Amendment 10. This alternative would allocate 3 trips (instead of 2 trips with no action) to controlled access areas of Georges Bank. Hudson Canyon area would be fully open and Elephant Trunk area would be open under controlled access in 2007 for 3 years. Status quo would allocate 67 DAS in 2006 and 62 DAS in 2007 to full-time vessels (Table 100). The economic impacts of the status quo alternative were analyzed above in Section 5.2.1.1 to Section 5.2.1.3 relative to the no action. Status quo alternative will result in higher landings compared to no action both in the short and the long-term, but in lower landings compared to some alternatives with modified Elephant Trunk area (ETA) reopening and Groundfish closed area access (Table 101 and Table 105). In the same way, total economic benefits of status quo will be higher than the benefits for no action, but lower than benefits with most of the other alternatives with modified rotation schedule, Delmarva closures and a five year controlled access for ETA (Table 103 and Table 106).

5.2.1.5 Discussion of prices, costs and sources of uncertainty in the analyses

The economic impacts are determined by the level of scallop landings, fishing effort, i.e., DAS, and size and price of scallops for each rotation option. The prices are estimated using the price model presented in Appendix I, which takes into account the impacts of changes in meat count, domestic landings, exports, income of consumers, and composition of landings by market category (i.e., size of scallops) including a price premium on under count 10 scallops.

As mentioned in the sections above, the revenues and total net benefits were estimated by updating the scallop price estimates in order to take into account unexpectedly large increase in prices during 2005, from an average price of \$4.85 per pound in 2004 to over \$9 per pound in recent months. Among the major factors that contributed to this increase were the changes in world demand and supply of scallops, increase in US exports, decrease in the imports from major competitors of US such as Canada and Japan, the increase in import prices and the change in the composition of landings towards larger scallops.

Although estimation of scallop prices from a global perspective is beyond the scope of this analysis, the tripling of exports from an average of 5 million during the 1990’s to about 17 million in 2004 indicates that a rise in the international demand for US scallops played an important role in prices (See the Section on trends in imports and exports, Appendix I). The rise in demand for US scallops, especially from the European countries accelerated even further in 2005, with an increase in exports by 50% from January 2005 to August 2005 compared to the same period in 2004. If this trend continues during the rest of the year total scallop exports could exceed 25 million lbs. in 2005. If the same amount of total scallops are landed in 2005 as in 2004, i.e., about 62 million lbs., then the share of exports in total landings could reach 40%, and even more if landings decline to 53 million as some biological projections show. The economic analysis presented in the previous sections was conducted by assuming that 40% of what is landed will be exported in the coming years. Actual prices in the future could fall below the values that have been estimated in Table 101 to Table 106, however, if a smaller percentage of scallops are

exported. On the other hand, if new export markets are developed and exports as a proportion of the scallop landings increase in the future, the prices could be higher than estimated even with a larger domestic supply.

The economic analysis is also updated by taking into account this recent increase in import prices from an average of \$3.30 in 2004 to \$5.50 in 2005. Especially the import price of scallops from Canada and Japan increased due to lowered landings in the Canadian fishery and the outbreak of an infectious disease in Japanese aquaculture in recent years (See Appendix I for further analysis). The cutbacks in scallop landings in these countries reduced competition for the domestic scallops that are almost identical in quality to imported scallops from Canada, and similar to those imported from Japan, thus contributed to the increase in the price of domestic scallops. Although the decline in the value of dollar (by about 3% in 2005) explains some of this increase, the reduction in the international supply of scallops coupled with an increase in consumer preferences for scallops were mostly likely the major factors behind this rise in prices.

The change in the composition of landings toward larger scallops was another factor that led to an increase in the average price of scallops and in exports. The share of larger scallops continuously increased since 1999, and the share of 11-20 count scallops almost quadrupled from 11.7% in 1999 to 41.7% in 2004 (Table 108). On the other hand, the share of 31-40 count scallops declined from 20% in 1999 to 1.5% in 2004 and that of 41 plus count of scallops from 14% to almost nothing during the same years. As shown in Table 108, larger scallops, especially under 10-count (U10) scallops, priced higher than the smaller scallops. According to the biological projections these trends will continue in the future due to area rotation management. For example, the share of under-10 count scallops will increase to 14% and that of 11-20 count scallops to about 60% in 2005. For more discussion on the impacts of changes in the size composition of scallops see Appendix I.

Table 108. Composition of scallop landings and price by market category

Year	Data	Under 10 Count	11-20 Count	21-30 Count	31-40 Count	41+Count	Unclassified
1999	% of landings	16.6%	11.7%	25.2%	20.4%	14.3%	11.8%
	Ex-vessel price	6.79	6.92	6.43	5.81		
2004	% of landings	7.4%	41.7%	42.3%	1.5%	0.0%	7.1%
	Ex-vessel Price	5.76	4.89	4.66	4.81	5.18	5.76

It must be cautioned, however, that the price estimates are used in order to evaluate the comparative impacts of management options on fleet revenues, consumer and producer benefits relative to no action (or status quo), rather than to predict the absolute value of future prices. Actual values of future prices could be different than these estimates due to the changes in exogenous factors in the short- and the long-term. These exogenous changes include fluctuations in the world supply of scallops, in the level of scallop imports from Canada and Japan (main competitors of US scallops), changes in the value of dollar (impacts competitiveness and price of domestic scallops relative to scallops from other countries), in consumer preferences and income among several other factors. For example, in estimating the future scallop prices, it was assumed that the personal disposable income will increase at a rate of 1.4% a year, equal to the average rate of increase in the last 5 years from 1990 to 2004, leading to gradual increase in scallop prices over time (other factors held constant). If the disposable income does not increase at this rate due to, for example, the impacts of Katrina (in August 2005, DPI actually declined because of the devastation from hurricane), the estimated prices will be lower than shown in Table 101 to Table 106. The ranking of alternatives in terms of revenues and net economic benefits are not expected to

change significantly, however, as long as the values of the explanatory variables do not deviate drastically from the historical levels.

The cost benefit analysis also included updated cost estimates that took into account the recent increase in fuel prices. These costs are used in calculating producer surplus for the proposed alternatives, which, in turn, calculated as total revenue minus variable costs. The variable costs are defined as those expenses that increase or decrease with the level of fishing activity excluding the cost of crew. The crew incomes are determined from a lay system according to which crew gets 55% of the gross stock and pays for trip costs including food, fuel, oil, water, and ice (Georgianna et al, 2005)⁴⁵. The trip costs include food, ice, water and fuel, and are usually paid by crew in the scallop fishery out of their shares from the gross stock. Other variable costs include expenses on gear and supplies. Over 62 % of the trip costs consisted of fuel expenses and 17% consisted of food costs for the full-time dredge vessels (Table 109). Average trip costs, including food, fuel, oil, ice, water, and fishing supplies, amounted to \$938 per full-time vessel. Trip costs are higher when the cost of damage to gear and equipment during a trip is included in the trip costs, averaging \$1008 per full-time vessel, and \$953 for all vessels. Given that in September 2005 fuel prices increased by 55.9% as compared to September 2004, and for a full-time vessel fuel costs per DAS averaged \$587 in terms of 2004 prices, it could be expected that the fuel costs alone could increase to about \$915 per day in 2005. In addition, food costs, which was estimated to be \$178 per DAS in 2004, increased by 2.1%. After applying these increases, overall trip costs per DAS are estimated to increase to about \$1360 in 2005 from \$1008 in 2004. Further discussion on variable and fixed costs is provided in Appendix I.

Table 109. Variable costs per full-time vessel during 2001-2004 (in 2004 inflation adjusted prices)

Data	Year				
	2001	2002	2003	2004	Grand Total
Average fuel costs per DAS (\$)	535	549	594	610	587
Fuel costs as a % of total trip costs	59%	57%	62%	65%	62%
Average of food costs per DAS (\$)	114	211	181	160	178
Food costs as a % of total trip costs	11%	19%	18%	17%	18%
Average trip costs per DAS (\$)	870	986	938	913	938
Average trip costs including damage costs for gear per DAS (\$)	966	1,131	1,007	926	1,008

Source: Observer cost data, 2001-04

In short, the economic impacts of the measures proposed by Framework 18 and the alternatives were analyzed based on the available information of yield streams from the biological simulations and data on vessel costs, crew shares, prices, and revenues of the scallop vessels. Therefore, the numerical results of this analysis should be interpreted with caution due to uncertainties about the likely changes in:

- Factors affecting scallop resource abundance and landings
- Fishing behavior
- Fixed costs
- Variable costs including the price of fuel

⁴⁵ According to the recent study by Georgianna et al., “Employment, Income and Working Conditions in New Bedford’s Offshore Fisheries”, Crew shares dropped from 59% in 1993 to 55% in 2002. The report indicates that the lay system could also vary by vessel.

- Import prices
- Bycatch and revenues from other fisheries
- The share system
- The number of active vessels
- Structural changes in ownership
- The composition of fleet in terms of tonnage, horse power and crew size of the active vessels
- Disposable income and preferences of consumers for scallops
- Price differences and premium on small versus large scallops.
- Enforcement costs

5.2.2 Economic impacts of controlled access area alternatives, area specific limits, trip and quota allocations

The combined economic impacts of rotation area alternatives including controlled access area allocations, modified Elephant Trunk reopening and Groundfish closed area access, extended Hudson Canyon access program, area closures (Delmarva), and open area DAS allocations are analyzed in Section 5.2.1 above within the framework of ten rotation area management alternatives including no action and status quo. This section discusses the economic and distributional impacts of the following alternatives which were not included in the discussion of the combined economic impacts.

5.2.2.1 Area specific limits on fishing by limited access vessels

Maximum number of trips by area and possession limits

Proposed alternative will continue the status quo method of allocating controlled access trips subject to 18,000 lb. of possession limit and a maximum number of trips for each area compatible with the estimated TACs. This action is not expected to change economic and social benefits because there will be no change in regulations. Area specific allocations combined by possessions limits help to prevent overfishing in access areas, thus preventing reduction in future yield and in social and economic benefits from the scallop fishery. On the negative side, possession limits lower flexibility for vessels and increase fishing costs by making some vessels to take more trips than necessary to land the allocated amounts as discussed further below in connection with the non-preferred alternative with area specific total pounds per vessel. On the positive side, however, possession trips reduce incentives for derby style fishing, resulting in more stable landings and less fluctuation in prices over time. It could also prevent a decline in the catch rates and a rise in fishing costs that could occur from derby-style fishing. Status quo management has been in place since 1999, and the 18,000 lb. limit has been sufficient for vessels to make profitable trips, without forcing or allowing vessels to make longer trips to land greater volumes of scallops and potentially having negative impact on prices. Given that the proposed measures include elimination of crew limit in the controlled access areas, possession limits could also help to reduce a potential targeting on small scallops by vessels with large crews taking long trips. For these reasons, the benefits of the status quo management are expected to outweigh the negative economic impacts due to reduced flexibility to vessels from limits on trip landings. There could also be some benefits in terms of lower enforcement costs since limits on landings are monitored for each trip, i.e. the landings do not have to be monitored for each vessel over the season.

Area specific total pounds per vessel

Instead of specifying a possession limit and number of trips per vessel (status quo), non-preferred alternative would allocate a pre-determined amount of scallops during the fishing year from each controlled access area open to fishing. This measure will lower the fishing costs for vessels that could land their area specific allocations by taking fewer trips compared to the number of trips they need to take

if there was a possession limit per trip. As a result, producer surplus, as measured by the revenue minus operating costs, could increase. On the other hand, longer trips could potentially lower the meat quality and price of scallops. Since total amount of landings should stay at the same level compared to status quo trip allocations, the changes in scallop price and revenues would be not expected to be significant.

The economic gains from the elimination of trip limits will depend on the LPUE from each area at the time of the trip, which affects the trip duration and number of trips taken to land the allocated amounts. According to the biological projections for the proposed option, including 2000 open area DAS and closure of Delmarva starting in 2007, LPUE is estimated to range from 2100 lb. per day-at-sea (Hudson Canyon) to 2786 lb. per day-at-sea (Nantucket Lightship) for the next five years depending on the average meat count from each area (Table 110).

Table 110. Estimated LPUE from controlled access areas for the proposed option including 20,000 open area DAS and closure of Delmarva starting in 2007.

Data	Controlled Access Area	2006	2007	2008	2009	2010
LPUE	Closed area 1	2586	2571	Closed	2580	2566
	Closed area 2	2604	Closed	2629	2618	Closed
	Elephant Trunk	Closed	2512	2626	2683	2686
	Hudson Canyon	2145	2232	2151	2104	2119
	Nantucket lightship	2786	2777	2759	Closed	2746
Meat Count	Closed area 1	12.2	12.4	12.3	12.3	12.4
	Closed area 2	12.0	11.8	11.9	11.9	11.8
	Elephant Trunk	15.1	13.0	12.0	11.5	11.5
	Hudson Canyon	16.9	15.9	16.4	16.9	16.9
	Nantucket lightship	10.7	10.8	11.0	11.0	11.1

Actual LPUE is expected to vary, however, from vessel to vessel by crew size and by vessel's horsepower and gross tonnage, all of which affect how many scallops could be landed from a trip. In addition to LPUE, the economic gains from area specific quotas will depend on the duration of the trip and the impact of area quotas on the size and price of scallops landed. As with LPUE, trip length will also vary from vessel to vessel according to the vessel size (i.e., gross tonnage, horse power), number of crew on board, and the proximity of the fishing grounds to the port the where vessel is located. Average trip length for full-time vessels was approximately 8.4 days in 2004, and was slightly shorter of full-time small dredge and full-time trawl vessels (Table 111). There were a considerable number of trips, however, that took more than 9 days, and some that took longer than 16 days. Probably the trips to the controlled access areas were the shorter trips since landings from these trips were constrained by the trip limits. The actual trip lengths for the controlled access areas may exceed, however, the trip lengths observed in 2004 if the crew limit is eliminated for these areas as included in the proposed option.

Table 111. Average trip duration, LPUE, and scallop landings in 2004 by full-time limited access holders

Permit Category	Trip duration	Average trip duration by trip	Average LPUE	Number of trips	Percentage of total scallop landings	Average gross tonnage
Full-time	4 days or less	2.90	2005	304	2.80%	145
	5 to 8 days	6.87	2318	1302	35.38%	158
	9 to 12 days	10.16	1953	862	29.13%	157
	13 to 15 days	13.85	2013	325	15.49%	171
	16 to 18 days	16.51	1894	51	2.73%	158
Full-time total		8.41	2132	2844	85.52%	158
Full-time small dredge	4 days or less	2.87	1258	101	0.53%	94
	5 to 8 days	6.53	1172	162	2.15%	100
	9 to 12 days	10.44	1353	214	5.14%	108
	13 to 15 days	13.66	1092	62	1.58%	109
	16 to 18 days	16.60	779	5	0.11%	86
Full-time small dredge total		8.29	1246	544	9.51%	103
Full-time trawl	4 days or less	3.23	1910	40	0.43%	118
	5 to 8 days	6.46	2047	83	1.87%	117
	9 to 12 days	10.05	1851	76	2.40%	118
	13 to 15 days	13.25	1453	8	0.26%	141
Full-time trawl Total		7.42	1926	207	4.97%	118
Grand total		8.34	1986	3595	100.00%	147

Table 112 provides a scenario analysis in order to estimate economic gains from area specific quotas that could replace possession limit and trip allocations. It was assumed that the possession limit if applied will be 18,000 lb. per trip, the maximum trip length is 20 days-at-sea, the steam time is 2 days for a round-trip and that the crew size remains constant at 7-men. It was also assumed that there will be no impact on prices if area-specific quotas are implemented. Under these assumptions, economic benefits from quota allocation will consist of savings in trip costs if the vessels could derive their total allocations by taking fewer trips to the controlled access areas, thus reducing the time spent for steaming to and from the fishing grounds. The estimated cost savings may range from \$2,720 to \$13,600 depending on the reduction in the number of trips, which changes with LPUE and total pounds of controlled access area allocations per vessel. There will be 5 controlled access trips per full-time vessel in 2006, and 7 access trips in 2007. Although these trips are allocated for different areas, the vessels are allowed to exchange controlled access area trips with another vessel. If the vessels are allocated area-specific quotas rather than number of trips combined with a possession limit, there will probably be more incentive for vessels to exchange trips with each other. As Table 112 shows, larger the number of area specific pounds and larger the LPUE, the larger will be cost savings. Although the analysis includes only the trip cost saving which mainly benefit crew, there will be some cost savings for the vessel owners as well since less time at sea will reduce repairs and the maintenance costs.

These results will change, however, if the incentive to catch the quota at the shortest possible time before the catch rates fall down creates a race to fish and reduces LPUE. As a result, the trip lengths or the number of trips could increase eroding the savings in trip costs as shown in Table 113. In addition, the concentration of landings during high catch seasons could dampen the prices and reduce the economic gains.

Table 112. Cost saving estimates from area specific quotas

LPUE (landings per day-fished)	2000	2000	3000	3000	3000	3000	3000	4000
Area specific quota and/or total landings from controlled access area (lb.)	36000	54000	54000	72000	90000	108000	126000	126000
Number of trips with possession limit of 18,000 lb.	2	3	3	4	5	6	7	7
Number of trips with area quota	1	2	1	2	2	2	3	2
Days-fished per trip with possession limit	9.0	9.0	6.0	6.0	6.0	6.0	6.0	4.5
Days-fished per trip with area quota	18.0	13.5	18.0	12.0	15.0	18.0	14.0	15.8
Steam time (in days) per trip	2	2	2	2	2	2	2	2
Total trip length with possession limit	11	11	8.0	8.0	8	8	8	6.5
Total trip length with area quota	20	16	20.0	14.0	17	20	16	17.75
Total DAS with possession limit	22	33	24.0	32.0	40	48	56	45.5
Total DAS with area quota	20	31	20.0	28.0	34	40	48	35.5
Trip costs per DAS	1360	1360	1360	1360	1360	1360	1360	1360
Trip cost savings with quota	2720	2720	5440	5440	8160	10880	10880	13600

The negative impacts of derby-style fishing are illustrated by a scenario analysis in Table 113 based on assumptions about LPUE's and scallop prices. For example, if implementation of area specific quotas results in a decline in LPUE in an area from 2500 lb. per day-at-sea to 1500 lb. per day-at-sea, 72000 lb. of scallops could now be landed in 3 trips (instead of in 2 trips previously) at 18 days per trip including the steaming time. Such an outcome could actually increase trip costs by \$23,392 compared to taking 4 trips at a possession trip of 18000 lb. when LPUE stays at 2500 lb. per day-at-sea. If there is also a decline in prices even if by a small amount there could be a significant decline in scallop revenue net of trip costs. For example if scallop prices decline by 3% in the first and second scenarios, the net revenue would be less than \$14,000 for the first scenario, and \$42,000 for the second with also a decline in LPUE. Third scenario shows the impacts of a case if prices decline by 10% due to race to fish by vessels.

Table 113. Scenario analysis of the economic impacts of a potential race to fish

Data	Scenario 1	Scenario 2	Scenario 3
LPUE	2500	1500	1500
Area specific quota (total landings from area)	72000	72000	72000
Number of trips with possession limit	4	4	4
Number of trips with area quota	2	3	3
Days-fished per trip with possession limit	7.2	7.2	7.2
Days-fished per trip with area quota	14.4	16.0	16.0
Steam time (in days) per trip	2	2	2
Total trip length with possession limit	9.2	9.2	9.2
Total trip length with area quota	16.4	18.0	18.0
Total DAS with possession limit	36.8	36.8	36.8
Total DAS with area quota	32.8	54.0	54.0
Trip costs per DAS	1360	1360	1360
Trip cost savings with quota	5440	-23392	-23392
Price (possession limit)	9	9	9
Price (with quota)	8.7	8.7	8.1
Gross revenue with possession limit	648,000	648,000	648,000
Gross revenue with quota	628,560	628,560	583,200
Net revenue with possession limit	597,952	597,952	597,952
Net revenue with quota	583,952	555,120	509,760
Change in net revenue with quota	(14,000)	(42,832)	(88,192)

The area specific quota allocations could also have some distributional impacts if large vessels land their quota sooner than the small boats before the controlled access areas are closed due to the yellowtail bycatch. Although, the proposed measures allow allocation of additional open area DAS for each trip not taken before areas close from yellowtail flounder catches, the number of pounds allocated for open areas will probably be less than the allocations for access areas. This is because, DAS allocations will be increased by a prorated amount that is calculated to achieve an equal amount of scallop mortality per DAS, rather than an equal amount in terms of pounds. Therefore, a vessel may not be able to land the same amount of scallops in the open areas and incur a loss if they are unable to take their controlled access trips.

Finally, the numbers shown in Table 112 and Table 113 should be interpreted with caution for the following reasons:

- LPUE's shown in Table 113 are for the demonstration purposes only, since they could vary according to the vessel size among other factors, although a range of 2000 lb. to 3000 lb. are within the range of estimates from the biological model. An increase in crew size above 7-men could increase LPUE's, shorten the trips or the reduce the number of trips necessary to land area quotas as will be discussed further in Section 5.2.3.
- The trip costs per day-at-sea could change from vessel to vessel according to the vessel size and horsepower. They also vary according to the change in future fuel prices.
- A decrease in fuel prices would reduce the cost savings while an increase would augment them.

The impacts of quota allocation combined with an elimination of the crew limit are examined in Section 5.2.4 below.

5.2.2.2 Georges Bank area access measures

Framework 18 proposes to revise Georges Bank area rotation order and allocates a total of 5 trips to the CAII and NLS access areas in 2006 and 2 trips to CAI and NLS in 2007 in accordance with the proposed contingency schedule described in Section 3.3.1.2.3. The overall economic impacts of this proposed alternative is similar to the original preferred alternative allowing the limited access and general category vessels to fish in all three access areas in 2006, followed by Nantucket Lightship Area and Closed Area I in 2007. Contingency schedule for rotation of Georges Bank areas would eliminate the trip to Closed area 1, but allocate one more trip to Closed Area II compared to the revised rotation schedule. Because the total number of controlled access trips will stay the same, overall short-term impacts of the contingency schedule will be similar to that of the original preferred alternative except for the impacts on general category vessels as will be discussed below. The contingency schedule is expected to have positive impacts over the long-term as well since it would prevent localized depletion of the scallop resource and prevent reduction of future landings from Closed Area I.

The impacts of the proposed Georges Bank access measures combined with the proposed measures for Hudson Canyon, Delmarva and Elephant Trunk areas and with 20,000 open area DAS were examined in Section 5.2.1 above in Table 101 through Table 107 and the results were summarized in Section 5.2.1. Because the revised schedule allocates 5 trips to Georges Bank access areas compared to the no action schedule of a total two trips in 2006, the proposed measure by itself is expected to have positive economic impacts on vessels and on net economic benefits. In 2007 however, both no action and the proposed measures allocate 2 trips to Georges Bank access areas, thus would have similar economic impacts evaluated on this measure alone. With the exception of the no action and status quo scenarios, all of the remaining 8 scenarios analyzed in Section 5.2.1 were based on the proposed schedule for Georges Bank access. Among those scenarios, the scenario titled as “*F18 -24.K open DAS scenario*” is the most appropriate one to compare with the no action scenario since it does not include other measures such as Hudson Canyon access area extension and Delmarva Closures (Table 101 and Table 107). Also, both this scenario and the no action allocate about 25000 open area DAS in 2006 and 2007. As Table 101 shows, the landings for the proposed Georges Bank access area measures (estimated to be about 74.9 million lb. for F18- 24,7K open DAS scenario) would exceed no action landings (estimated to be around 59.2 million lb. in 2006) due to a larger number of trips allocated to these areas. As a result, the proposed Georges Bank access by itself would increase scallop revenues by 1.57% (Table 101) and total economic benefits by 12% in 2006, mostly due to the increase in consumer surplus (Table 101). If the impacts of the other proposed measures including 20,000 open area DAS and the extension of Hudson Canyon access for two years are combined with the Georges Bank access area measures (scenario “DMV- 20K open DAS in 2006 and 2007”), the economic impacts will still be positive with a 1.88% increase in revenue (Table 102) and 10.5% increase in total economic benefits compared to no action (Table 103).

Using the same scenarios, however, it is not possible to quantitatively separate the economic impacts of the Georges Bank area access measures from combined economic impacts of other measures for 2007 and for the future years. This is because, in addition to the proposed Georges Bank area access, all scenarios (except no action and status quo) also include proposed ETA measures allocating 5 trips to this area in 2007 instead of providing full access under no action. The results of the economic analysis were provided in detail in Section 5.2.1 and show that most alternatives with revised Georges Bank access schedule will have larger economic benefits compared to no action and status quo alternatives except when they are combined with 15000 and 18000 open area DAS alternatives in the short-term (Table 101 and Table 107). Similarly, the economic impacts of proposed Georges Bank area access measures combined with proposed measures for Hudson Canyon, Delmarva and Elephant Trunk areas and 20,000 open area DAS on scallop revenues, producer and consumer surpluses and total economic benefits are estimated to be positive both in the short and the long-term (Table 101 and Table 107). Total economic

benefits are estimated to increase by 2.95% in the short-term (2006-2007, Table 103) and by 1.96% in the long-term (2008-2019, Table 106).

The proposed contingency schedule could have some negative impacts in 2006 on some general category vessels, however, since it may not be possible for many of these smaller boats to access Closed Area II to substitute for the Closed Area I trips. Closed Area I will be reopened to fishing in 2007, thus these impacts will be temporary. The short-term negative impacts are expected to be minimal as well for the following reasons:

- Rotation area management requires the closure of some areas in order to achieve optimum yield from the scallop fishery and minimize environmental impacts by harvesting scallops more efficiently when biomass is high. When a controlled access area is opened to fishing, both the general category and the limited access boats realize the benefits of area rotation. The general category fishery realizes these benefits through the 2% TAC allocation. Without area rotation to build scallop biomass and harvest scallops at a more optimum, larger size, many of the areas would not be viable as a fishing area for the general category vessels, which are limited to landing 400 lbs. per trip per day.
- Similarly, when a specific access area is closed, neither the limited access nor the general category vessels can catch scallops from that area. The economic benefits accrue to both limited access and general category fishermen in the future, however, through the increase in the overall biomass and long-term yield from the scallop resource. The closure of Closed Area I access area in 2006 will protect scallops in this small area from overfishing, and therefore will result in higher future benefits for both the limited access and general category vessels when it is reopened to fishing in 2007. These long-term benefits are expected to outweigh short-term loss from the closure of CAI.
- If on the other hand, the Closed Area I access area remained open to fishing in 2006 and 2007 with the higher TACs associated without shifting a trip to Closed Area II, the catches would generate fishing mortality several times higher than the target, depleting the scallops that are available in Closed Area I for fishing. As a result, daily catches would drop to levels that were no longer viable for a general category trip, at least during 2007 if not sometime during 2006. The contingency alternative is expected to prevent this depletion from happening, allowing the area to continue as a rotation area and benefit both limited access and general category vessels.
- The proposed contingency schedule allocates 865 trips to CAII for general category vessels in 2006, whereas these vessels would get 278 trips in 2006 to CAI if this area was not closed and 577 trips to CAII. In the same way, under no action general category vessels would get about 195 trips to CAI in 2006. Given that there were 476 general category vessels that participated in the scallop fishery in 2004, and 290 of these vessels fished in the New England areas taking a total of about 4100 trips, the 278 CAI trips would amount to at most one trip per general category vessel. If a general category vessel was not able to take this trip in the open areas, the reduction in gross revenue from one trip would amount to \$3000 assuming a price of \$7.5 per pound estimated for the proposed alternative, or \$2500 reduction on net revenue assuming a \$500 trip cost. For the worst case scenario assuming that none of the 278 allocated general category trips are taken in the open areas, total loss in net revenue would be \$695,000 (278*2500). However, it is unlikely that there will be no effort displacement with the closure of CAI area and that for most general category vessels not to take any of these trips in the open areas.

- Shifting one Closed Area I trip to Closed Area II will not affect these vessels in the same way it could affect limited access vessels. Since limited access vessels are constrained by area-specific trip and open area DAS allocations, any vessel that cannot take its trip in CAII would lose the revenues associated with that trip (unless of course, the vessel was able to exchange these trips for Elephant Trunk area trips in 2007 with some other vessel) since it cannot take the same trip in the open areas. Because the general category vessels are not managed by DAS limits, however, they could take more trips in the open areas of Georges Bank and/or Mid-Atlantic to compensate for the trips they couldn't take to Closed Area I. Given that Closed Area I became a much smaller area than anticipated due to the EFH closures with the recent Court order, the closure of this area is not expected to reduce significantly the fishing opportunities for general category vessels to take their scallop trips in the areas that is open to fishing.
- An insight on the potential impacts of shifting CAI trips to CAII for the general category vessels could be obtained by examining 2004 general category activity, when, in fact, CAI was closed but CAII was open to fishing. Figure 21 and Figure 22 show that none of general category dredge or scallop trawl vessels took any trips to the Closed Area II in 2004. In fact, according to VTR data, there were no trips taken by these vessels to the entire 3-digit area which encompasses Closed Area II either in 2003 or in 2004 fishing years.
- An exception is finfish otter trawls that landed scallops as a bycatch in Closed Area II during 2004 under the general category rules (Figure 23). There were 77 finfish otter trawl vessels in 2004 and 15 vessels in 2003 that access Closed Area II, landing minor amounts of scallops (a total of 1500 lb. of scallops in 2003 and 89,890 lb. in 2004 fishing years). Nearly all of the trips were associated with the yellowtail flounder SAP, which had a fairly significant amount of scallops caught incidentally to the target yellowtail flounder. These trips were permitted to land 400 lbs. of scallop meats under general category rules.
- Other than these, all of the general category landings occurred in the open areas of Georges Bank and in Mid-Atlantic areas. There is little reason to expect that most of these general category dredge (or trawl) vessels will fish in CAII in 2006 at a cost of extra steaming time and higher trip costs, while they could land the same amount of 400 lb. scallops in the open areas with closer proximity to the ports. Even though the average size of scallops is expected to be somewhat larger in Closed Area I and II (about 12.2 meats per pound as opposed to 16.9 meats per pound in Georges Bank open areas and 16.5 meats per pound in Mid-Atlantic areas) and even if they were priced at an extra dollar more per pound, this could add only \$400 to trip revenues whereas extra steaming time could cost \$500 to \$1000 per day-at-sea depending on the size of vessel (see Section 5.2.1.5 and Appendix I for the estimation of price and costs). In other words, because revenues net of trip costs are likely to be higher for fishing in open areas rather than in Closed Area II, there will not be much monetary incentive for many general category vessels to access this area.
- Economic impacts of the revised Georges Bank area access schedule on the general category vessels should also be compared with no action, which allocates one trip to CAI for these vessels. With the proposed alternative it is expected that the majority of the general category vessels will substitute CAI trip by taking an extra trip in the open areas, with the exception of otter trawls as mentioned above. Since these latter vessels have the capability (in terms of GRT and horse power etc.) to access Closed Area II and/or regularly fish in that area to land groundfish while landing scallops as a bycatch, they will not be impacted in any significant way from the proposed contingency schedule since they could continue to take their trips to CAII. In any case, scallop landings by finfish trawls constitute a small proportion of total general

category scallop landings in the Georges Bank area (about 17% in 2004, see Table 45 and Table 49 in Section 4.4.4) with negligible impacts on the overall general category fishery. For other general category vessels that take their trips in the open areas instead of CAI, there would be either no reduction in net revenue (as measured by gross revenue net of trip costs) or at most a minimal loss if the price of scallops landed from open areas are lower compared to a potentially higher price for larger scallops that could have been landed from CAI it was open.

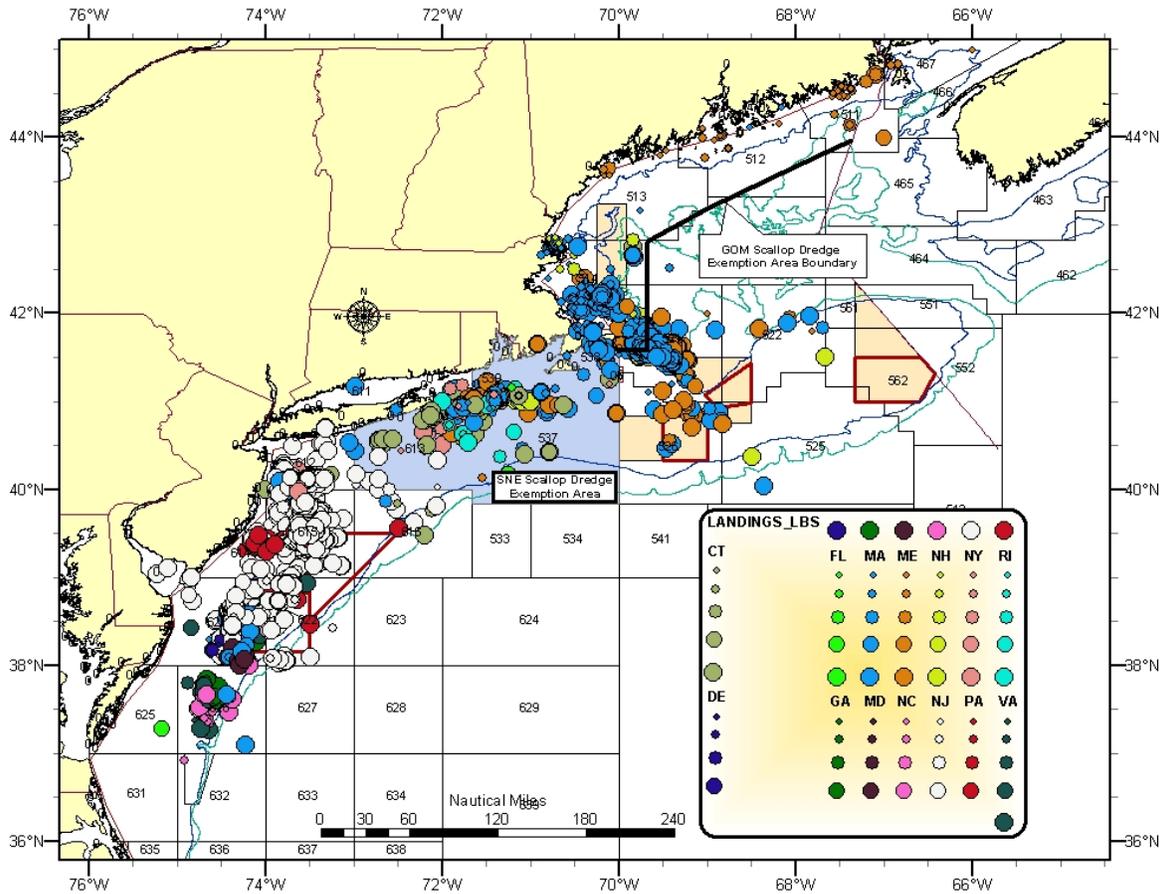


Figure 21. Reported fishing locations by vessels with general category permits using dredges to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports

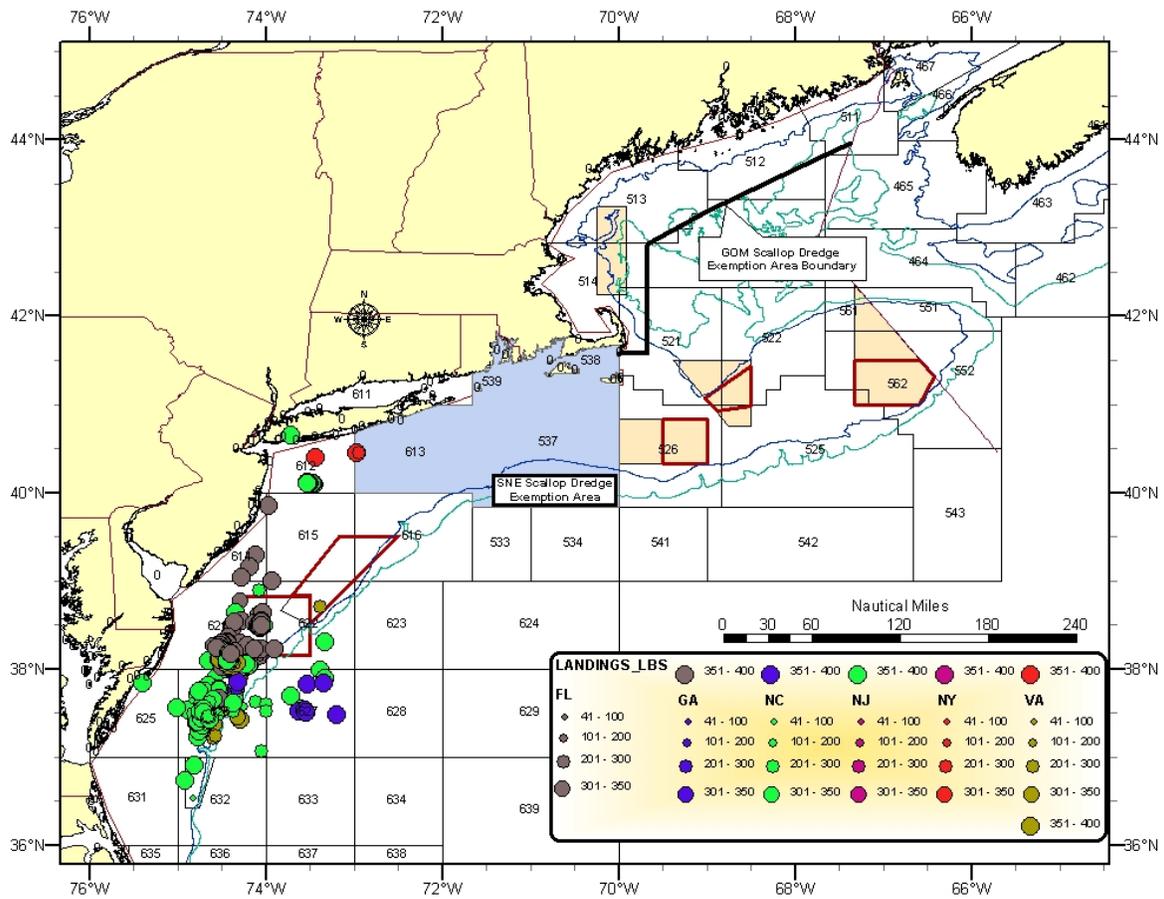


Figure 22. Reported fishing locations by vessels with general category permits using scallop trawls to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports

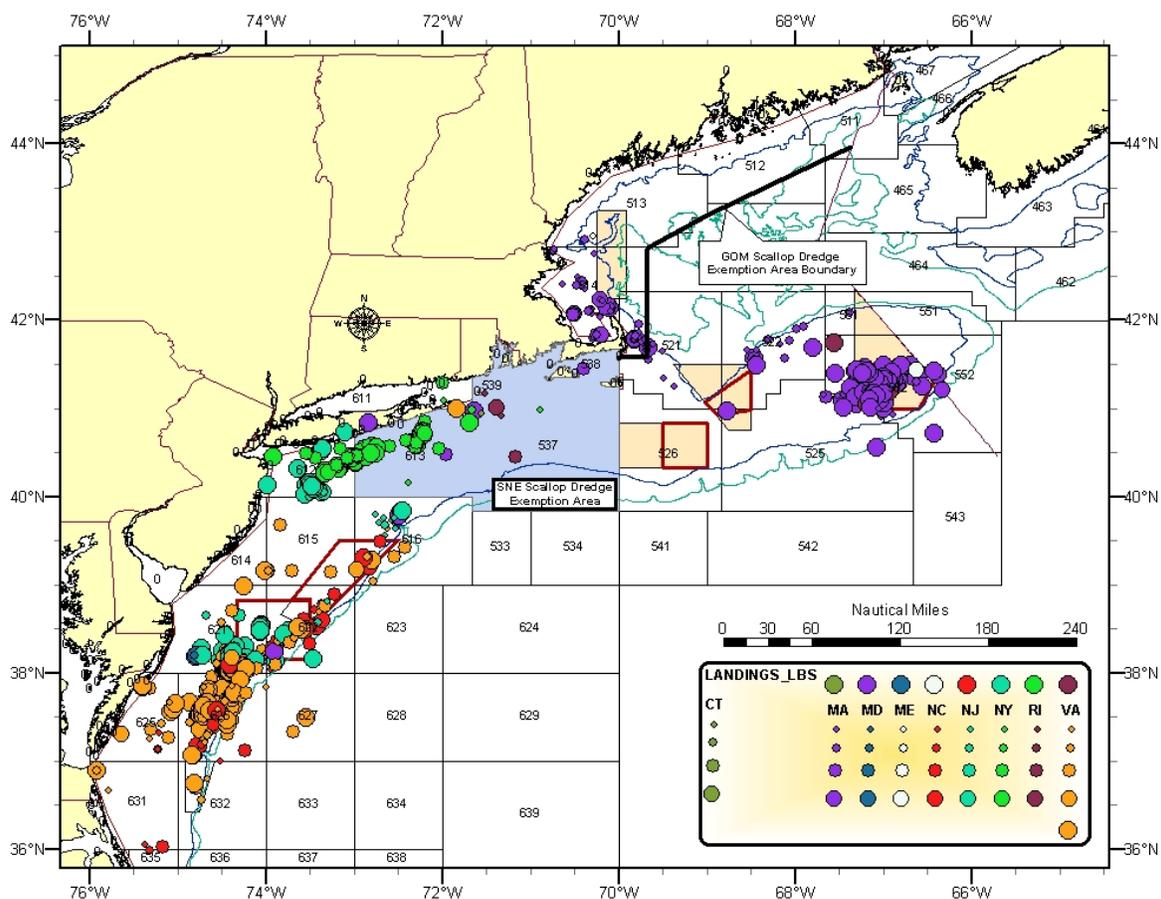


Figure 23. Reported fishing locations by vessels with general category permits using finfish trawls to land sea scallops in 2004, categorized by homeport. Source: NMFS permits and vessel trip reports.

5.2.2.3 Adjustments when yellowtail flounder catches reach the 10% TAC limit

According to the preferred alternative, limited access vessels with unused Georges Bank access area trips would have their open area DAS allocations increased by a prorated amount that is calculated to achieve an equal amount of scallop mortality per DAS. This alternative will have a positive impact on 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 (Section 3.3.1.2.4 for calculation of open area DAS adjustments for each Georges Bank access area trip lost due to closure from yellowtail flounder catches). 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, some examples provided in Section 3.3.1.2.4 shows that, it could be significant depending on the open area meat counts. For example if the open area meat count averages 17.2 meats per pound, catches from the additional open area trips could range from 11,214 lbs to 12,709 lbs. compared to the 18,000 lbs. of trips lost due to closure of the access areas. Evaluated at a scallop price of \$9.00 per pound, for example, the reduction in revenue compared to the access area revenue could exceed \$60,000 in the first case and \$47,000 in the second case. The higher the meat count in the open areas, however, higher will be catches from these trips, and smaller will be the loss.

Another alternative would allocate an equivalent number of trips with an 18,000 lb. possession limit to vessels that were not able to take their access area trips due to the closures. These trips would not count against the vessel's open area DAS allocations and would not reduce total pounds and revenue compared to the trips allocated for controlled access areas. This approach would also reduce the incentive to take access area trips as quickly as possible and prevent derby-style fishing effects. On the other, the long-term impacts on the scallop resource and economic benefits could be negative since fishing on the transferred trips in the open areas could take longer than in the access areas and cause more fishing mortality per DAS.

Another alternative considered by the Council was to allocate initially half the trips in each area, raising later if the yellowtail flounder catches are not expected to exceed the 10% TAC set aside. This alternative would reduce the potential for a derby-style fishery from developing during the period when the first half of the trips are allocated. On the other hand, there could still be potential for derby style fishing when the second half of the trips are released as vessels rush to take trips before areas close from excess catches of yellowtail flounder. It would also prevent any shift in fishing effort to the open fishing areas and prevent increases in open area fishing effort beyond those associated with optimum yield. On the other hand, under this alternative each vessel could be allocated less trips, thus could have lower revenues as compared to the preferred alternative for allocating additional open area trips.

The status quo alternative would allow vessels to fish 12 DAS in open areas for up to two trips not taken before areas close from yellowtail flounder catches, thus it would prevent transfers of more than 24 DAS in 2006 and any shift in effort in 2007. This alternative would have a negative economic impact on vessels that could not take 3 or more of their trips in the controlled access areas. On the other hand, it would limit the potential shift of fishing effort to the open fishing areas where fishing mortality will exceed the amount that maximizes yield-per-recruit.

5.2.2.4 Hudson Canyon Area Rotation Measures

Extension of the Hudson canyon area access program will have positive economic impacts on vessels by allowing them to take unused 2005 HCA trips during the 2006 and 2007 fishing years when catch rates improve relative to the 2005 levels. It will also spread out effort over time and reducing fishing mortality in 2005, helping to improve yield and economic benefits in future. This area will be fully open to fishing with the no action and status quo alternatives, and with some other rotation area alternatives examined in Section 5.2.1. In general, the alternatives with extension of Hudson canyon area access program results in larger average landings per year, and larger net economic benefits compared to alternatives which keep this area fully open to fishing, except with alternatives that allocate 18000 open area DAS (lower benefits in the short-term) and 30000 open area DAS (higher benefits in the short-term). Section 5.2.1 provides a comparative analysis of the economic impacts of these measures combined with Elephant Trunk reopening and Groundfish closed area access, area closures (Delmarva), and open area DAS allocations.

5.2.2.5 Elephant Trunk area (ETA) rotation measures

5.2.2.5.1 Precautionary initial trip allocations and set-asides

The preferred alternative would revise the total TAC and the number of controlled access trips to ETA when it reopens in 2007 consistent with the current biological projections based on survey data from August 2004. Relative to status quo, this approach would reduce the initial TACs, set asides, and allocations by about 50%. The maximum number of trips that could be authorized is estimated to be 5 trips per vessel. The economic impacts of this measure were analyzed in section 5.2.1 as a part of the 10 rotation area alternatives. In summary, landings and revenues with the precautionary initial trip

allocations will be less than the landings and revenues with the status quo option in 2007. Over the long-term, however, the net economic benefits with the proposed access schedule will be larger compared to the benefits with status quo and no action alternatives (except when these measures are combined with 24700 or 30000 open area DAS with no Delmarva closures and with Hudson Canyon fully open). For detailed results and further discussion see Section 5.2.1.

Impacts of maximum trip allocations for general category vessels for fishing in Elephant Trunk area

Trip allocations for the ETA would be made so that the maximum catch on general category catches would approximate 2% the TAC calculated with a 0.32 fishing mortality target. This measure could have negative economic impacts on the general category scallop vessels, but positive economic impacts for the scallop resource and fishery. The limits on maximum number of general category trips and landings may not present, however, a significant decline compared to the levels of general category fishing activity in recent years. The status quo alternative would authorize 2529 general category trips and allocate about one million pounds of scallops for general category fishery. These numbers are equivalent to one-third of general category trips and general category scallop landings in 2004 from all areas. The proposed alternative (i.e., precautionary initial trip allocations), however, will allocate 1360 general category trips and allocate about 0.54 million pounds of scallops for general category fishery. This allocation is almost equal to the total landings by general category vessels in 2004 from statistical areas 621 and 622 (which contain all of Elephant Trunk Area in addition to the part of Delmarva and Hudson Canyon access areas, as well as open parts of these areas). There is no question, however, that compared to no action this measure would have some negative impact on the general category landings and revenues since ETA would be fully open in 2007 under no action, without any limits on the total number of general category trips. This impact cannot be quantified because the potential number of general category trips to the ETA cannot be estimated for the no action scenario, which in addition to ETA, keeps Hudson Canyon and Delmarva areas open to fishing. On the other hand, if the general category catches are not controlled, the landings from this area could exceed the fishing mortality targets, reduce the scallop biomass and yield in the future. This could result in lower allocations in the future for both the limited access and general category vessels and reduce the net economic benefits from the scallop resource. Therefore, long-term economic benefits from maximum trip allocations are expected to outweigh the short-term negative impacts on some general category vessels.

5.2.2.5.2 Re-opening of Elephant Trunk Area to controlled access fishing on January 1, 2007

This alternative will have positive economic impacts by helping to spread out fishing effort and landings over time, by providing vessels more flexibility about when to fish, thus will help to keep revenues stable and to lower costs of fishing compared to an opening on March 1, 2007, the beginning of the fishing year.

5.2.2.5.3 Seasonal closure of the Elephant Trunk area

Seasonal access restrictions can have negative economic effects on scallop fishermen by reducing their flexibility in choosing when to fish and by increasing the costs of fishing. These measures will have positive economic benefits for other fisheries and uses of ocean resources if they are effective in reducing finfish bycatch and sea turtle interactions. If seasonal closures were effective in reducing bycatch, they would also prevent more stringent measures on scallop fishermen with larger negative impacts in the future.

The impacts of this closure is evaluated using the fishing activity data in 3-digit statistical areas 621 and 622 which include ETA. Table 118 (Section 5.2.2.7) shows that 206 full-time vessels fished in

area 621 and 192 vessels fished in area 622 in 2004. Overall, the preferred seasonal closure and the alternatives are not expected to affect scallop landings of the vessels since they could still take five trips (for full-time limited access vessels, less for other categories) allocated to this area during the months when the area stays open. On the other hand, seasonal closures could increase fishing costs by limiting the ability of vessels to fish during more optimal times (for example, when the fuel prices are lower) for them. Closures could also have a negative impact on scallop prices and revenues when the trips are taken within a narrower time period, especially if closure season is relatively long. These negative impacts on costs and prices will be alleviated, however, as vessels fish in open areas during the seasonal closure of ETA. On the other hand, for many vessels that primarily fish in these areas (125 out of 206 vessels that fished in 621, and 120 out of 192 vessels that fished in 622), fishing farther away from their homeports could be costly.

The preferred alternative will minimize these negative impacts on fishing costs relative to other closure alternatives by proposing to close ETA for only two months from September 1 to October 31st when it opens to fishing in 2007 as a controlled access area. Table 114 shows that the majority of trips in 2003 and 2004 from these areas took place during the months when the area will stay open. Only 19% of the landings from the statistical areas 621 and 622 took place during the proposed closure period in 2003 and 16% in 2004. Because 3-digit areas 621 and 622 not only include the Elephant Trunk area (ETA) but also part of Delmarva and the adjacent open areas, it is not possible to predict quantitatively the impacts of ETA closure on landings, prices and revenues. Assuming, however, the seasonal fishing activity in the Elephant Trunk area is similar to the seasonal fishing activity in those statistical areas, the proposed closure from September 1 to October 31st could potentially impact about 1/5th (or less) of the scallop trips. Because, these trips could be taken during the 10 months the ETA will be open, and during September and October, the vessels could fish in the open areas, the negative economic impacts of this closure are expected to be minimal. These relatively small negative impacts could be outweighed by the positive impacts from reducing finfish bycatch and sea turtle interactions, lowering the possibility of more stringent controls on scallop fishery and a reduction in net economic benefits in the future.

Table 114. Landings and number of trips during the proposed closure seasons for areas 621 and 622.

YEAR LANDED	CLOSURE SEASON	DATA	3-DIGIT STATISTICAL AREA		GRAND TOTAL
			621	622	
2003	Sept.1 –Oct.31	Scallop landings (lb.)	1,687,245	1,620,638	3,307,883
		% of landings	13%	32%	19%
		Number of trips	137	118	255
2003	Other months	Scallop landings (lb.)	10,821,253	3,434,325	14,255,578
		% of landings	87%	68%	81%
		Number of trips	796	269	1,065
All Months		Total landings	12,508,498	5,054,963	17,563,461
2004	Sept.1 –Oct.31	Scallop landings (lb.)	2,348,665	939,972	3,288,637
		% of landings	19%	11%	16%
		Number of trips	188	71	259
2004	Other months	Scallop landings (lb.)	10,070,700	7,609,591	17,680,291
		% of landings	81%	89%	84%
		Number of trips	686	551	1,237
All Months		Total landings	12,419,365	8,549,563	20,968,928

The alternative options close ETA for a longer period, one alternative from July 15 to October 31st and another alternative from June 15 to November 14, and thus could have larger negative impacts on vessels. Table 115 shows that 39% of the landings from 3-digit statistical areas 621 and 622 took place during the July 15 to Oct.1 in 2003 and 32% in 2004, affecting about twice as many trips compared to the preferred closure option. If closure season were extended even more to include the period from June 15 to November 14, it would affect half of the trips to these areas in 2003 and 2004, during which more than half of the scallop landings occurred (Table 115). Because these 3-digit areas not only include the Elephant Trunk area (ETA) but also part of Delmarva and the adjacent open areas, it is not possible to predict quantitatively the impacts of ETA closure on landings, prices and revenues. There is no question, however, that the negative impacts of such extended closures on fishing costs and price fluctuations could be significant compared to the two month closure proposed by Framework 18. The closure of the Delmarva area during the same year and the closure of the Hudson Canyon area except for trips not taken in 2005, will further narrow fishing opportunities when ETA is closed, especially for these vessels that are unable to fish in New England and northern part of Mid-Atlantic. These extended closures could also have a negative impact on scallop prices and revenues when the 5 trips that would be allocated to full-time vessels in the Elephant Trunk area are taken within a narrower time period, leading to higher landings and lower prices during the access season, and higher prices during the closure period, having an unstable effect on revenues throughout the year.

Table 115. Landings and number of trips during the alternative closure season for areas 621 and 622.

YEAR LANDED	CLOSURE SEASON	DATA	3-DIGIT STATISTICAL AREA		GRAND TOTAL
			621	622	
2003	July 15 - Oct.31	Scallop landings (lb.)	4,163,057	2,717,856	6,880,913
		% of landings	24%	15%	39%
		Number of trips	280	182	462
	June 15 - Nov.14	Scallop landings (lb.)	6,493,167	3,599,904	10,093,071
	% of landings	52%	71%	57%	
	Number of trips	431	254	685	
2004	July 15 - Oct.31	Scallop landings (lb.)	3,971,499	2,755,215	6,726,714
		% of landings	19%	13%	32%
		Number of trips	311	208	519
	June 15 - Nov.14	Scallop landings (lb.)	5,922,914	4,822,780	10,745,694
	% of landings	48%	56%	51%	
	Number of trips	426	340	766	

On the other hand year round access would provide the most flexibility for fishermen to determine when to take Elephant Trunk Area trips. However, it would not offer any additional protection and conservation to minimize finfish and scallop discard mortality, or to reduce interactions with sea turtles, thus potentially increasing the negative economic risks to scallop fishermen if more stringent measures becomes necessary in the future to provide such protection.

5.2.2.6 Procedures to adjust Elephant Trunk Area (ETA) allocations

The Council voted at its September 2005 meeting to support the concept behind the Elephant Trunk area adjustment mechanism making use of a more rapid, event-triggered rulemaking to correct the ETA allocations in terms of the number of trips (not days-at-sea) in the open area. This procedure is expected to have positive economic impacts by ensuring that optimum yield is achievable even if there is insufficient time to develop a framework adjustment when new ETA biomass data becomes available. Adjustments by framework action for ETA and open area allocations, in addition to the normal two-year

schedule of Scallop FMP framework actions, will also have positive economic impacts by adjusting allocations in order to achieve optimal level of landings from the scallop resource.

5.2.2.7 Economic impacts of Delmarva closures

The impacts of the potential closures of the Delmarva area were examined in combination with the other area rotation and open area DAS alternatives in Section 5.2.1. Very short-term impacts of the proposed closure indicate that landings will be lower and prices will be higher due to the closure in 2007. As a result, fleet revenue is expected to increase slightly compared to the no action scenario, when DMV closure is combined either with 18,000 or 20,000 open area DAS alternatives (**Table 101**). The impacts on total economic benefits are estimated to be slightly negative in 2007, however, due to the decline in landings and in consumer benefits during this year. Over the long-term (2008-2019), however, the economic benefits are estimated to be slightly positive and exceed the benefits for other alternatives if the DMV area was closed. Inflation adjusted cumulative net benefits net are estimated to increase by 2.5% if Delmarva area is closed and total open area DAS is set at 20,000 (Table 107). On the other hand, total cumulative fleet revenue in the long-run could be slightly lower than no action level (by 1.3%, See Table 106) due to the estimated decline in scallop prices. These changes represent a change over a 12 year period and on a per-year basis they reflect marginal change from the no action levels. Therefore, both in the short term (i.e., 2007), and in the long-term, overall economic impacts of Delmarva closures are expected to be small.

In addition to the aggregate impacts on the net economic benefits, however, closing DMV area starting in 2007 could also have distributional impacts on vessels which mostly fish in Mid-Atlantic areas. The full-time vessels will be allocated 52 open area DAS in 2006 and 51 open area DAS in 2007. Most of the open areas will be located in Georges Bank and northern Mid-Atlantic, however, since DMV will be closed in 2007 and ETA will be a controlled access area and HCA will only be open for taking unused 2005 trips. As a result, the vessels that traditionally do not fish in these open areas may be impacted negatively. Table 116 shows that 140 out of 292 (164 out of 275) full-time vessels fished only in Mid-Atlantic areas in 2004 (2003). On the average, the vessels that fished only in the Mid-Atlantic region derived approximately 23% of their scallop landings from 3-digit area 626, most of which will be closed to fishing in 2007 as part of the Delmarva closures. Therefore, Delmarva closure would necessitate a displacement of fishing effort for vessels that depend heavily on this area for their revenues from scallop fishing. Activity of the part-time vessels by area is shown in Table 117.

Table 116. The activity by full-time limited access vessels by specific areas in Mid-Atlantic

Year	Permit category	Data	Did not fish in New England	Fished in New England	Grand Total
2003	FULL-TIME	Number of vessels	164	111	275
		% Landings from 615 (includes part of the HCS)	18%	17%	18%
		% Landings from 616 (includes part of the HCS)	5%	14%	8%
		% Landings from 621 (includes part of DMV & ETA)*	36%	5%	24%
		% Landings from 622 (includes ETA,HCA)	13%	6%	10%
		% Landings from 626 (DMV)	19%	1%	12%
		% Landings from other Mid-Atlantic	9%	12%	10%
		% Landings from New England	0%	46%	18%
2004	FULL-TIME	Number of vessels	140	152	292
		% Landings from 615 (includes part of the HCA)	14%	18%	16%
		% Landings from 616 (includes part of the HCA)	6%	22%	14%
		% Landings from 621 (includes part of DMV & ETA)	31%	13%	22%
		% Landings from 622 (includes ETA,HCA)	21%	9%	15%
		% Landings from 626 (DMV)	23%	4%	13%
		% Landings from other Mid-Atlantic	5%	4%	5%
		% Landings from New England	0%	29%	15%

ET: almost all of ET is in 621, and almost none of HCA landings came from 622.

Table 117. The activity by part-time limited access vessels by specific areas in Mid-Atlantic

Year	Permit category	Data	Did not fish in New England	Fished in New England	Grand Total
2003	PART-TIME	Number of vessels	23	6	29
		% Landings from 615 (includes part of the HCA)	17%	0%	14%
		% Landings from 616 (includes part of the HCA)	17%	0%	13%
		% Landings from 621 (includes part of DMV & ETA)	1%	27%	6%
		% Landings from 622 (includes ETA,HCA)	49%	0%	39%
		% Landings from 626 (DMV)	8%	4%	8%
		% Landings from other Mid-Atlantic	0%	69%	14%
2004	PART-TIME	Number of vessels	16	9	25
		% Landings from 615 (includes part of the HCA)	13%	0%	8%
		% Landings from 616 (includes part of the HCA)	6%	12%	8%
		% Landings from 621 (includes part of DMV & ETA)	8%	3%	6%
		% Landings from 622 (includes ETA,HCA)	36%	10%	26%
		% Landings from 626 (DMV)	26%	12%	21%
		% Landings from other Mid-Atlantic	0%	62%	0

The impacts DMV closures on scallop vessels located in different states are examined using the VTR data which includes information on the areas fished for each vessel only by 3 digit statistical area. This approach provides a rough estimate about the distributional impacts of closures since the boundaries of the potential DMV closure, as well as the boundaries of the controlled access areas, i.e., ETA and HCA, do not exactly match with the boundaries of the 3-digit areas. The analysis is focused on full-time scallop vessels since part-time and occasional boats, although will be impacted from DMV closure, they have relatively less reliance on scallop revenue and will have less open area DAS (part-time vessels 21 days in 2006 and 20 days in 2007, and occasional vessels will have 4 days) compared to the full-time boats.

Table 118 summarizes the fishing activity by full-time vessels and scallop landings in 2004 by five specific 3 digit areas, 615-616, 621-622, and 626, which will be most impacted by the proposed measures in Framework 18. Of particular interest is the area 626, which includes most of proposed DMV closure in 2007. There were 128 vessels in 2004 and 96 vessels in 2003 that landed scallops from this area that will not be able to do so in 2007. In 2007, HCA will be open only for taking unused 2005-trips, and ETA will be a controlled access area. Therefore, a major part of areas 615, 616 and 621, 622 will not be available for open area DAS fishing. Therefore, especially those vessels that fish in 626 and only in the Mid-Atlantic areas will be affected by the DMV closure. An analysis of the characteristics and scallop revenues for vessels that fished in area 626 is provided in Table 119.

Table 118. Scallop landings and fishing activity by 3 digit statistical area

3 digit areas	Description	Landings in 2004	Landings per vessel and number of full-time vessels fished (2004)	Access in 2006 fishing year	Access in 2007 fishing year
615	Contains HCA and Long Island areas.	10 million lbs.	215 vessels, 93 of which only fished in Mid-Atlantic areas in 2004. Average landing per vessel was 40,492 lbs. of scallops for the second group (i.e. 93 vessels) from 615.	No new trips in the HCA part of the area, but the rest will be open.	No new trips in the HCA part, but the rest will be open.
616	Contains HCA and New York Bight areas	8.8 million lbs.	141 vessels, 33 of which only fished in Mid-Atlantic areas in 2004. Average landing per vessel was 36,925 lbs. of scallops for the second group (i.e. 33 vessels) from 616.	No new trips in the HCA part, but the rest will be open.	No new trips in the HCA part, but the rest will be open.
621	Contains mainly the Elephant trunk area, and a part of Delmarva	12.4 million lbs.	206 vessels, 125 of which only fished in Mid-Atlantic areas in 2004. Average landing per vessel was 62,216 lbs. of scallops for the second group (i.e. 125 vessels) from 621.	A major part of this area will be closed due to the ETA closure.	Most will be open with a total of 5 trips, or 90000 lbs., allocated per full-time vessel to ETA (including 621 & 622).
622	Contains mostly ETA, and part of it contains HCA although almost none of HCA landings came from 622 recently.	8.5 million lbs.	192 vessels, 120 of which only fished in Mid-Atlantic areas in 2004. Average landing per vessel was 47,085 lbs. of scallops for the second group (i.e. 120 vessels) from 622.	Most of this area will be closed because HCA will be open only for carry-out trips and ETA will be closed. Only a NYBS corner will be open.	Most will be open with a total of 5 trips, or 90000 lbs., allocated to ETA (including 621 & 622). There will be only carry-over trips to HCA portion.
626	Contains mostly DMV	8.3 mill.lbs.	128 vessels, 97 of which only fished in Mid-Atlantic areas in 2004. Average landing per vessel was 72,223 lbs. of scallops for the second group (i.e. 120 vessels) from 622.	Open	Most of this area will be closed.

Table 119. Scallop Revenue and characteristics of vessels that fished in Delmarva 626 area

Year	Data	Fished only in Mid-Atlantic	Fished in New England and Mid-Atlantic	Grand Total
2003	Number of vessels	91	5	96
	Scallop Revenue from 626 (\$, average per vessel)	236,718	103,544	229,781
	Total Revenue (\$, average per vessel)	712,839	638,103	708,947
	Crew	6.5	6.4	7
	Horse power	710	1056	728
	Gross Tonnage	138	136	138
	Total landings from 626	5,530,556	133,043	5663599
	Percentage of total scallop revenue from Mid-Atlantic	100%	73%	98.6%
	2004	Number of vessels	97	31
Scallop Revenue from 626 (\$, average per vessel)		341,537	194,399	305,902
Total Revenue (\$, average per vessel)		963,806	998,652	972,245
Crew		6.5	6.6	7
Horse power		803	835	811
Gross Tonnage		140	151	143
Total landings from 626		7,005,644	1,191,232	8,196,876
Percentage of total scallop revenue from Mid-Atlantic		100%	77.2%	94.5%

There were 128 (96) full-time vessels in 2004 (2003) that fished in 626, the 3-digit area which constitutes a major part of the proposed DMV closure. Most of these vessels, 97 out of 128, fished only in the Mid-Atlantic region, deriving on the average \$341,537 from this area. Closure of Delmarva does not mean that these vessels will incur a reduction in their revenue by this amount since during the same year, starting in January 2007, they will be able to fish up to five trips in the ET controlled access area, which was closed to fishing since July 2004. The revenues from this area will far exceed the revenue derived from 626 in 2004. For example, if the scallop prices stay at their current levels of \$9.00 or more, total revenue from 5 trips of 18,000 lb. will amount to \$810,000. Even if prices fall down their 2004 level of \$5 per pound, the revenue from elephant trunk (\$450,000) would exceed average revenue per vessel from 626 in 2004.

There is no question that those vessels that are unable to fish in New England and northern part of Mid-Atlantic, could be more negatively impacted by Delmarva closure than other vessels which are more mobile in terms of fishing area. As Table 121 showed, percentage of scallop landings from other areas of Mid-Atlantic, including the northern part (covered by 3-digit areas 611-615), was quite small in 2003 and 2004. Given that LPUE is expected to average 1700 lbs. of scallops per day-at-sea, not being able to fish open area DAS allocation would result in a loss of gross stock of 15,300 per day if scallop prices stayed around \$9 per lb, and \$8,500 per day if prices were equal to \$5 per pound.

It is not possible, however, to estimate at this time how many vessels will be unable to fish a part of their open area allocations and/or how many will incur the cost of relocating to another port to access the Georges Bank or northern Mid-Atlantic open areas. Some vessel-owners may have more incentive to do so than others since fishing activity by area is different for each vessel. As Table 120 shows, about 52 full-time vessels earned 30% or more of their scallop revenue from area 626, while the rest of 45 vessels that fished in this area in 2004 had less fishing activity in this area. Table 121 shows that most of the vessels that derived a large proportion of their scallop revenue from Delmarva area are homeported in Virginia and North Carolina. There were 74 such vessels out of 97 vessels that fished in 626 but not in

New England, which on the average landed 40% of their annual scallop landings from this area. Therefore, these vessels are expected to be impacted relatively more from a Delmarva closure compared to vessels from other ports. Again, it should be mentioned that although these vessels may have difficulty fishing their open area DAS allocations in Mid-Atlantic due to the closures and controlled access of major areas, the opening of ETA in 2007 is estimated to generate revenue from scallop fishing comparable to what they would earn from Delmarva area as discussed above and as shown by the cost benefits analysis of the proposed alternatives provided in Section 5.2.1.

Table 120. Full-time vessels that fished Mid-Atlantic region only by their % landings from 3 digit statistical area 626.

Percentage of landings from 626	Data	2003	2004	Grand Total
<10%	Number of vessels	14	16	30
	Total Revenue	\$696,453	\$932,760	\$822,483
	Scallop Revenue from 626 (\$, average per vessel)	\$48,302	\$51,097	\$49,792
	Percent of landings from 626	7%	5.40%	6.04%
	Gross Tonnage	137	132	134
	Horse power	668	766	720
	Length	77	76	76
10%-29%	Number of vessels	33	29	62
	Total Revenue	\$719,218	\$882,210	\$795,456
	Scallop Revenue from 626 (\$, average per vessel)	\$147,207	\$166,539	\$156,250
	Percent of landings from 626	20%	18.74%	19.55%
	Gross Tonnage	141	136	139
	Horse power	762	726	746
	Length	78	78	78
30%-49%	Number of vessels	23	27	50
	Total Revenue	\$729,962	\$921,894	\$833,605
	Scallop Revenue from 626 (\$, average per vessel)	\$275,304	\$379,208	\$331,412
	Percent of landings from 626	39%	40.83%	39.81%
	Gross Tonnage	138	141	140
	Horse power	723	825	778
	Length	80	79	80
50% or more	Number of vessels	21	25	46
	Total Revenue	\$694,986	\$1,123,593	\$927,925
	Scallop Revenue from 626 (\$, average per vessel)	\$460,726	\$689,731	\$585,185
	Percent of landings from 626	70%	61.65%	65.53%
	Gross Tonnage	137	148	143
	Horse power	641	892	777
	Length	78	81	80

Table 121. Full-time vessel activity by home state and area fished in 2004.

Fished in New England in 2004	Data	Home state			Grand Total
		MA	NC, VA, FL	NY, NJ, PA	
No	Count of VP_NUM	4	74	19	97
	% Landings from 626 (major part of DMV)	12%	40%	15%	34%
	% Landings from 615 (includes part of the HCS)	30%	7%	16%	10%
	% Landings from 616 (includes part of the HCS)	21%	1%	5%	3%
	% Landings from 621 (includes part of DMV & ETA)*	31%	25%	39%	28%
	% Landings from 622 (includes ETA,HCA)	4%	23%	19%	21%
	% Landings from other Mid-Atlantic	2%	4%	6%	4%
	Scallop revenue per vessel from 626 (\$, average)	150,025	413,446	101,787	341,537
	Annual scallop revenue per vessel from all areas (\$, average)	1,149,741	998,024	791,392	963,806
Yes	Count of VP_NUM	9	16	6	31
	% Landings from 626 (major part of DMV)	14%	24%	20%	20%
	% Landings from 615 (includes part of the HCS)	9%	5%	11%	7%
	% Landings from 616 (includes part of the HCS)	24%	6%	0%	10%
	% Landings from 621 (includes part of DMV & ETA)*	20%	17%	22%	19%
	% Landings from 622 (includes ETA,HCA)	7%	18%	22%	16%
	% Landings from other Mid-Atlantic	5%	6%	4%	5%
	Scallop revenue per vessel from 626 (\$, average)	155,387	208,811	214,484	194,399
	Annual scallop revenue per vessel from all areas (\$, average)	1,202,496	842,523	1,109,230	998,652
Total number of vessels		13	90	25	128

5.2.3 Open area management

The economic impacts of the open area DAS allocation alternatives combined with controlled access area allocations, modified Elephant Trunk reopening and Groundfish closed area access, extended Hudson Canyon access program, area closures (Delmarva) are examined in detail in Section 5.2.1. In general, the higher open area DAS allocations results in lower economic benefits over the long-term.

5.2.4 Economic Impacts of the elimination of crew limits for controlled access areas

Raising or eliminating the crew limit for limited access vessels is expected to have positive economic impacts on producer surplus as measured with the difference of total revenue and variable costs of fishing. This measure could also relieve fatigue for the crew, and offer an opportunity for vessels to take on and train new crew, with potentially positive impacts on productivity and future employment. Since more crew could shuck a larger number of scallops, the catch per day is expected to increase, shortening the trip time to land the possession limit. As a result some trip costs such as fuel and oil is expected to decline, and the meat quality of and price of scallops to increase. Since according to the lay

system crew members pay the trip expenses, reduction in this item would increase total income to the crew. The vessel owners could benefit as well if shorter and less frequent trips results in a decline in maintenance, repairs and other trip costs that are not taken from the crew shares. On the other hand, division of the total crew share among more crew members is expected to reduce income per crew as demonstrated below in Table 122 and Table 123 both for management with area specific trip allocation and with the area specific quota allocation. The income per crew can decline further if there is a race to fish by many vessels employing a large crew before the daily catch rates declines later in the season or before the area is closed due to bycatch. Such derby style fishing can lower the catch rates further and reduce scallop prices due to the increase in landings within a short period of time.

There could be a significant risk to scallop resource and economic benefits, however, from the elimination of 7-person crew limit if vessels with large crews start targeting smaller scallops in controlled access areas. As discussed in Section 5.1.1.4 (Crew Limit Biological Analysis), such changes in fishing behavior would reduce yield-per-recruit and the biological and economic benefits of area rotation.

The economic impacts of the change in crew size are analyzed for 7 to 9 persons based on the approach and estimates for landings per unit effort (LPUE) provided in Section 5.1.1.4 (Crew Limit Biological Analysis).⁴⁶ These estimates and other assumptions used in the economic analysis could be summarized as follows:

- The LPUE estimates shown in Table 122 and Table 123 are based on an average count of scallops 15 meats per pound, which are consistent with the estimates from biological simulations for 2006 and 2007. If there are no changes in fishing behavior, it is estimated that 7-men crew may be able to process 2800 lb. of scallops per DAS, 8 men crew 3200 lb. per day, and 9-men crew 3600 lb. That is, LPUE is assumed to increase at a constant rate of 400 lb. per additional crew member (Table 122).
- There could be a change in fishing behavior, however, with more crew. As indicated in Section 5.1.1.4 (Crew Limit Biological Analysis), in the shorter controlled access area trips, crews may work longer hours per day. If vessels with more crew divide the tasks to make the crew more efficient, it increases the average amount of time per hour that is dedicated to shucking. A seven person crew working 16 hour days, for example, can process 3,700 lb./day of 15 count scallops, and 8-person crew 4,600 lb./day, and 9-men crew 6,200 lb./day. Table 123 shows the results corresponding to this scenario of increasing returns to crew, i.e., increase in LPUE at an increasing rate.
- The price of scallops is assumed to be \$9 per pound, which only impacts estimates for gross revenue and income per crew, but has no affect on cost savings.
- The crew incomes are estimated from a lay system according to which crew gets 55% of the gross stock and pays for trip costs including food, fuel, oil, water, and ice (Georgianna et al, 2005)⁴⁷.

⁴⁶ There are no empirical estimates of the impacts of a crew size larger than 9 persons on landings per day-at-sea (LPUE) since the crew size usually did not exceed 9 persons even before the 7-men crew limits was implemented. The section on the 'Crew Limit biological analysis' provides some LPUE estimates based on the work by Dr. James Kirkley (VIMS, NEFMC 1993a) which are used in the economic analyses in this section.

⁴⁷ According to the recent study by Georgianna et al., "Employment, Income and Working Conditions in New Bedford's Offshore Fisheries", Crew shares dropped from 59% in 1993 to 55% in 2002. The report indicates that the lay system could also vary by vessel. Some crew members reported that captains' bonuses (10% of the boat share) were paid from the owner's share before DAS and now paid from gross stock, which would reduce the crew share. Others reported that cost of boatracs responders and/or payments to the Fisheries Survival Fund (\$500 per trip) are now paid from the gross stock rather than from owners share.

Food costs per crew were estimated to be \$26.50 per crew/per day-at-sea and fuel costs at \$915 per day-at-sea after adjustment made for the increase in fuel prices during 2005. Other trip costs such as oil, ice, water are estimated at 115 per day-at-sea. As a result, total trip costs that are paid from crew shares add up to \$1,211 for 7 persons and to \$1,342 for 12 persons. The boat owners are assumed to pay for supplies, maintenance, repairs to vessel and engine, liability and accident insurance and the mortgage. The gear repairs and supplies per trip estimated to be \$149 per day-at-sea, which are assumed to decline as the vessels take fewer trips or spent less time at sea per trip. Total trip operating costs as a sum of all these items (i.e., food, fuel, oil, ice water, supplies and gear repair), amounts to \$1,360 per day-at-sea (see Section 5.2.1).

- Maximum days fished is assumed to be 16 days, and with steaming time maximum total number of days spent at sea is assumed to be 18 days. As Table 111 indicated only 2.73% of the trips by full-time vessels lasted 16 to 18 days in 2004, and the majority of the trips did not last more than 12 days. Increasing the crew size and/or allocating area specific quotas may increase the trip length, however, compared to what has been observed during the previous years. The estimated cost savings will increase (decrease) if trip length is longer (shorter) than the maximum assumed length of 18 days.
- The top parts of Table 122 and Table 123 show the results for area trip specific allocations of 18,000 lb. using an example of 5 trips per vessel, adding up to 90000 lb. from all 5 trips. The bottom part of the tables shows the results for the proposed option with an area specific quota allocation of 90,000 lb. per vessel. In the second case, vessels are allowed to take any number of trips to land the total amount.

Table 122. A scenario analysis of economic impacts of increasing of crew size assuming constant increase in LPUE with additional crew.

Controlled access area alternatives	Crew Size		
	7	8	9
Area specific trip allocation (18000 lb. trip limit)			
Total controlled access trips	5	5	5
Pounds per trip	18,000	18,000	18,000
LPUE in the short-term	2800	3200	3600
DAS fished per trip	6.4	5.6	5.0
DAS fished plus steaming time	8.4	7.6	7.0
Total DAS for 5 trips	42.1	38.1	35.0
Total trip costs from all trips	57,504	53,032	49,613
Cost savings (compared to 7 men crew)		4,472	7,891
Gross revenue from all 5 trips	810,000	810,000	810,000
Total crew income (crew shares minus trip costs)	394,275	347,918	351,338
Income per crew	56,325	43,490	39,038
Net boat share	277,221	277,819	278,285
Area specific quota allocation (90,000 lb.)			
Days-fished per trip with area quota (MAX)	16	16	16
Maximum scallop pounds per trip	44800	51200	57600
Number of trips	2.0	1.8	1.6
Total number of rounded (up) trips	3.0	2.0	2.0
Average Scallop pounds per trip	30000	45000	45000
Total DAS fished	32.1	28.1	25.0
Average DAS fished per trip	10.7	14.1	12.5
DAS-fished plus steaming time per trip	12.7	16.1	14.5
Total DAS (for all controlled access trips)	38.1	32.1	29.0
Total trip costs	51874	43690	39440
Trip cost savings		8184	12434
Gross revenue	810000	810000	810000
Total crew income (crew shares minus trip costs)	399,137	405,601	408,714
Income per crew	57020	50700	45413
Net boat share	277,817	278,713	279,179

Table 123. A scenario analysis of economic impacts of increasing of crew size assuming exponential increase in LPUE with additional crew.

Controlled access area alternatives	Crew Size		
	7	8	9
Area specific trip allocation (18000 lb. trip limit)			
Total controlled access trips	5	5	5
Pounds per trip	18,000	18,000	18,000
LPUE in the short-term	3700	4600	6200
DAS fished per trip	4.9	3.9	2.9
DAS fished plus steaming time	6.9	5.9	4.9
Total DAS for 5 trips	34.3	29.6	24.5
Total trip costs from all trips	46,836	41,125	34,752
Cost savings (compared to 7 men crew)		5,710	12,084
Gross revenue from all 5 trips	810,000	810,000	810,000
Total crew income (crew shares minus trip costs)	403,779	359,825	366,198
Income per crew	57,683	44,978	40,689
Net boat share	278,386	279,095	279,847
Area specific quota allocation (90,000 lb.)			
Days-fished per trip with area quota (MAX)	16	16	15
Maximum scallop pounds per trip	59200	73600	90000
Number of trips	1.5	1.2	1.0
Total number of rounded (up) trips	2.0	2.0	1.0
Average Scallop pounds per trip	45000	45000	90000
Total DAS fished	24.3	19.6	14.5
Average DAS fished per trip	12.2	9.8	14.5
DAS-fished plus steaming time per trip	14.2	11.8	16.5
Total DAS (for all controlled access trips)	28.3	23.6	16.5
Total trip costs	38521	32049	22462
Trip cost savings		6472	16059
Gross revenue	810000	810000	810000
Total crew income (crew shares minus trip costs)	411,072	416,232	424,549
Income per crew	58725	52029	47172
Net boat share	279,280	279,989	281,039

The results of the analyses presented in Table 122 and Table 123 could be summarized as follows:

- The increase in the number of crew persons is estimated to reduce DAS fished per trip and trip operating costs, increase total crew and boats shares, and reduce income per crew for all scenarios, and with both area specific trip and quota allocations.
- Increase in the number of crew members will have larger cost savings if addition of more crew results in an exponential increase in the landings per unit effort (LPUE) compared to a constant increase in LPUE. In the first case, the decline in income per crew will also be smaller.
- Increase in the number of crew beyond the current crew limit of 7 persons will reduce the number of controlled access trips when combined with area specific quota allocation and increase the cost savings further as compared to trip allocations (at a possession limit of 18,000 lb.). As a result, increase in total crew share will be larger, and the decline in income per crew with each additional crew will be smaller.

- The cost savings and economic benefits from fishing with larger crew could quickly disappear, however, if it leads to a derby style fishing by vessels concerned about lower the catch rates later in the season or closure of the access areas due to yellowtail bycatch. Such race to fish can reduce scallop prices, thus revenues, crew income and boat shares if there is a significant increase in landings within a short period of time. The proposed adjustments when yellowtail flounder catches reach the 10% TAC limit and the limits in the trip pounds due to the proposed status quo management are expected to mitigate these negative impacts by reducing the incentive for derby style fishing.
- Elimination of 7-person crew limit could also reduce the long-term benefits if vessels with large crews start targeting smaller scallops in controlled access areas, leading to overfishing of the scallop resource and reduced landings and economic benefits in the future.

5.2.5 Economic Impacts of the controlled access area trip exchanges

5.2.5.1 Economic Impacts of the elimination of the June 1 deadline for controlled access area trip exchanges

Elimination the deadline is expected to have positive economic impacts by providing greater flexibility for vessel owners and fishermen to respond to existing conditions, and to lower fishing costs as well as business and safety risks.

5.2.5.2 One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel

Allowing vessels that are closer or prefer to fish in the Georges Bank access areas than in the Elephant Trunk Area (and vice versa) to exchange their trips with another vessel will have positive economic impacts. This is expected to provide flexibility to vessels regarding which areas to fish, thereby reducing fishing costs without changing the total number of trips allocated in each area during a fishing year. Such exchanges would also make the fleet more efficient in catching the TACs with less fishing effort and environmental impacts. Although there will be some short-term costs to vessels from postponing 2006 Georges Bank access area trips, it is possible for the exchanging vessel owners to negotiate compensation for the postponed landings, thus mitigate the short term costs for one of the exchanging vessels.

5.2.5.3 Exchanges of 2006 Georges Bank access trips and open area DAS with another limited access vessel

This non-preferred alternative would provide one to one exchanges of controlled access area trips for areas open to fishing during the same fishing year. Although, this program would have positive economic impacts on the exchanging vessels, it could also have negative overall impacts on economic benefits if it increases fishing mortality of scallops. The vessels with constraints on fishing offshore waters of Georges Bank could benefit trading their Georges Bank trips with another vessel for open access area trips, whereas the more efficient vessels could lower their fishing time by taking more trips in Georges Bank instead of the open areas. As a result, fishing costs could decline and producer benefits could increase. On the other hand, because catches on open area DAS trips are unlimited, a vessel could land more scallops compared to the vessel giving away the open area DAS if, for example, it fishes closer to port, or is more efficient at scallop fishing in the open areas. In this way, one to one exchanges of controlled access area trips for open areas could result in a shift of fishing effort to those areas by more powerful and efficient vessels. Therefore this program have the potential to increase overfishing in the open areas by some amount, reduce the benefits of area rotation program, reduce future yield and economic benefits from the scallop resource.

5.2.5.4 One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year

Overall economic impacts of this alternative were analyzed in combination of the area rotation measures and as a part of the Hudson Canyon Area management alternative. This measure is expected to have positive economic impacts by allowing the vessels to delay their unused trips until conditions improve and more catch per DAS could be landed than currently possible. In the same way, providing vessels the flexibility to take unused compensation trips in 2006 or 2007 due to a broken trip would not force the vessel to take those trips during the 2005 fishing year when resource conditions are less favorable.

5.2.5.5 One to one exchanges of controlled access area trips for controlled access area trips open to fishing during the same fishing year (status quo) (proposed action)

This program will have positive economic benefits by providing flexibility to vessels to exchange their allocated trips in one Georges Bank controlled access area with another vessel to fish in Georges Bank access area of their choice. In this way, the vessels could lower their costs and increase their profits by fishing in access areas closer to their ports and/or to their traditional fishing grounds. The status quo alternative proposed by Framework 18 will not require changes in the regulations and will not allow exchanges between yearly allocations or with the open area allocations. This measure will ensure that fishing effort and scallop mortality in the open areas will not exceed the targeted amount or to reduce future yield, social and economic benefits from the scallop resource. Therefore, this alternative will have positive economic impacts by helping the benefits of area rotation program and open area management to continue.

5.2.5.6 Economic impacts of broken trip exemption program (60-day carry forward)

60-day carry forward of compensation trips will allow vessels to take these trips during the first 60 days when the same area is open to scallop fishing during the following fishing year. This would have positive impacts on vessels, however, by reducing the risk associated with trips taken at the end of a fishing year, or at the end of a seasonal access program, and lowering any revenue loss if the compensation trips could not be taken at the end of the same fishing year due to weather or other factors. On the other hand, this alternative would reduce the ability of the FMP to achieve the annual fishing mortality targets for controlled access areas by providing incentive for some trips planned to be taken in a particular fishing year to be postponed to the next year.

5.2.6 Economic impacts of the research set-aside program

The Council decided that none of the changes to the research set-aside program considered in this action are ready to be implemented. More work is needed to specify the details of the modifications under consideration. In general, two percent of controlled access area TACs and two percent of open area DAS set-asides for funding scallop-related research through compensation trips are expected to have positive economic impacts by improving information, thus management of the scallop resource. Disposition of unused research set-asides through a second RFP for the current year or rolling unused amounts into subsequent fishing years or re-allocating TAC/DAS to industry during the current fishing year will have positive impacts either on scallop research or the scallop industry and realize more immediate net benefits from the unused allocation.

5.3 Social Impacts

5.3.1 Area Specific landings limits (quota)

Providing vessels with a controlled access area yearly quota would have positive social impacts from the increased flexibility such a quota would represent, and would have no more tendencies towards highgrading, and perhaps fewer tendencies to discard, than the status quo, which essentially operates as a trip-level quota for controlled access areas. Provided that such a quota remained non-transferable, it would not be subject to the types of negative social impacts that have been identified with traditional ITQs, such as industry consolidation with its potentially negative impacts on community sustainability. However, if the measure were to encourage taking trips of a longer duration compared to the status quo, there could be additional effects on the industry, including a decreasing quality of scallop meat with consequent impacts on revenue and consumer satisfaction; increasing time away from home and community, with negative impacts on family and community life, and increasing labor demands on crew, leading to increased crew fatigue and other health and safety issues.

5.3.2 Georges Bank Access Area Measures

The stabilization of access trips and landings across years would have in general positive social impacts, though those vessels with less mobility than others would not be as able to take advantage of trips in particular areas. IN particular, the contingency alternative to shift trips from Closed Area I to Closed Area II will have more negative effects on smaller vessels and on general category vessels (which tend to be smaller vessels) due to the increased distance required to travel to Closed Area II. In terms of the alternatives regarding adjustments when catches reach the 10% yellowtail flounder TAC set aside, Alternative 3.3.1.2.4.2 and Alternative 3.3.1.2.4.3 are expected to have more positive social impacts in that they reduce the potential for derby-style fishing and the related negative effects on safety and fishing revenue. Alternative 3.3.1.2.4.3 (allocation of half the trips in each area and raising them by October 1) could be less beneficial for especially smaller vessels, if the reallocation of Georges Bank trips after October results in trips remaining to be taken during seasons of bad weather and difficult fishing conditions.

5.3.3 Hudson Canyon trip exchanges

Allowing vessels to exchange Hudson Canyon Area trips during 2006 would have positive social impacts compared to the status quo (which would require all trips to be taken by the end of 2005 with potentially low yields), in terms of increasing vessel flexibility to fish when and where is most appropriate that vessel.

5.3.4 Elephant Trunk Area Rotation

The preferred alternative would have positive social impacts if the biomass has indeed been overestimated, and the precautionary approach enables better fishing in the future. However, if the biomass has not been overestimated than clearly the Status Quo option has more positive social impacts in terms of incomes received to fishermen. Opening two months earlier than the fishing year (the preferred alternative) would have positive social impacts in that it increases the time frame for fishing and hence increases the flexibility for fishermen to better take advantage of fishing opportunities. However, such benefits may be limited to those fishing with larger vessels or others generally more able to fish in the winter weather of January and February. Seasonal

closures of the ET area and seasonal access restrictions would have positive benefits for other fisheries and uses of ocean resources if they are effective in reducing finfish bycatch and sea turtle interactions. Their impact on scallop fishermen would have negative effects on fishing flexibility, and possibly on fishing income, depending on when best fishing practices occur. Split season allocations would have positive social impacts in that they would reduce the negative effects of derby-style like fishing such as negative effects on safety and fishing revenue. Unrestricted trip allocations could see negative effects from derby-style fishing, however would see positive impacts from the flexibility afforded by fewer restrictions on when best to fish.

5.3.5 Adjustments to Elephant Truck Area Allocations

Social impacts that stem from effectively and quickly responding to biomass changes would be enhanced by any measure that seeks to speed up regulatory change. However, the move to Notice Action in place of Framework action does set a precedent for putting regulatory change out of the public process, which potentially limits the participation by fishermen and other interested parties in assessing resource changes and represents a move away from co-management and the types of positive impacts on a fishery that co-management has been associated with.

5.3.6 Delmarva Area Rotation

Social impacts that stem from responding to biomass changes would be enhanced by any measure that seeks to protect small scallops. However, negative social impacts may be associated with closing particular areas, if they are in areas that fishermen have traditionally fished. Those most impacted would be less mobile fishermen, such as those fishing with smaller vessels or those whose fishing knowledge is tied to particular areas. Social impacts would stem not only from changes in fishing income, but also potential family changes from fishing farther from home and safety issues from fishing further from home or in unfamiliar areas.

In terms of the Delmarva closure, trips by scallop vessels in this area in general targeted scallops exclusively; according to 2004 logbook records, 91% of the landings (in landed pounds) on scallop trips were scallops. But summer flounder was also a significant by-catch or sub-target fishery, accounting for 5.5% of the total on scallop trips, and monkfish also counted for another 2.2%. By-catch fisheries appear more frequently in non-dredge trips, especially for limited access vessels (Table 124). Although limited access dredges caught most of the scallops, a significant portion was caught by non-dredge gear, including 19% of Delmarva landings by general category vessels using non-dredge gear (Table 124). Table 125 shows the 2004 use of the proposed Delmarva closure, by port of landing. Ports most affected, in terms of the proportion of their scallop landings coming from the proposed closure, are Ocean City MD and Chincoteague VA, both of which show landings primarily from general category vessels (Table 125). Ocean City was 23rd in landed value of scallops in the Northeast, but with scallops accounting for less than 4% of total landed value in the port in 2003 (see 2005 SAFE report). Since 2000, Chincoteague has gone from no landings of scallops to being the port with the tenth highest landed value of scallops, which accounted for 46% of the port's landed value in 2003. Although primarily landed by general category vessels, these vessels in North Carolina tend to be much larger on average than general category vessels in general, which may mitigate the effects of the closure somewhat (2005 SAFE report).

Table 124 - Trip characteristics in the proposed Delmarva closure (2004 logbooks)

Plan	Gear used	Landed lbs scallops, from Delmarva	% of Delmarva landings	No. of trips	% of trips where scallops were less than half of the total catch
General	Dredge	27,806	1.5	86	0.0
Category	Non-dredge	352,123	18.7	1,032	5.6
Limited	Dredge	1,340,896	71.2	733	0.7
Access	Non-dredge	161,920	8.6	152	27.6

Table 125 Use of the proposed Delmarva closure, by port of landing (2004 logbooks)

Port Landed	Landed lbs scallops, from Delmarva	No. of vessels	No. of trips	% of Delmarva lbs scallops compared to total lbs scallops landed in port	% of Delmarva lbs scallops landed by limited access vessels
New Bedford, MA	138,162	29	42	0.5	100
Ocean City, MD	18,144	6	55	41.3	17
Wanchese, NC	5,009	5	8	4.7	98
Cape May, NJ	207,715	62	212	2.2	88
Long Beach, NJ	22,933	7	21	0.8	100
Wildwood, NJ	Cannot report	2	Cannot report	1.4	100
Chincoteague, VA	348,191	43	1,074	44.4	9
Hampton, VA	256,861	48	248	6.2	96
Newport News, VA	641,446	61	373	6.2	99
Seaford, VA	204,190	20	131	5.7	100
Yorktown, VA	Cannot report	2	Cannot report	9.1	100

Note. Only ports with at least 5,000lbs scallops landed in Delmarva. Cannot report information for ports with fewer than 3 vessels.

5.3.7 Open Area allocation

Social impacts from the predicted open area DAS allocations, though hinging on the particular combination that is eventually chosen, are not expected to create new shifts in the social environment from the status quo given the overall similarity of DAS between current 2005 allocations and expected 2006 ones. However, the overall trend to divide DAS into open and access areas does have social impacts from the inherent tendency to change the geographic distribution of fishing (affecting those less mobile fishermen) and from changing the job satisfaction that many fishermen derive from a style of fishing dependent more on their own skill and knowledge of fishing grounds than on others.

5.3.8 Crew Limits

The social impacts from raising the crew limit for controlled access trips are expected to be mostly positive, in terms of relieving overwork and related health issues, increasing safety, and providing opportunities for new recruits and shackers. However, if the unlimited crew size leads to smaller scallops being landed, then both the immediate impacts (if prices are lower for small scallops) and the long-term impacts (when harvesting smaller scallops affects future landings) would be negative. Negative impacts would also stem from splitting among a greater pool of crew a catch that is constrained by a trip limit, leading to reduced crew income on these trips.

5.3.9 Trip exchange deadline

Social impacts in terms of safety and fishing opportunities are expected to be positive from any measure to increase flexibility in responding to trip exchanges, given that fishermen

will be better able to make fishing decisions throughout the fishing year and respond to unexpected changes in resource and market conditions.

5.3.10 Trip exchange

Social impacts in terms of safety and fishing opportunities are expected to be positive from any measure to increase flexibility in making trip exchanges that correspond better to differences in vessel mobility and preferred areas of fishing.

5.3.11 Broken trip 60-day carry forward

Social impacts in terms of safety and fishing opportunities are expected to be positive from any measure to increase flexibility in responding to broken trips.

5.3.12 Research-set-aside program

Positive impacts expected from increase in research possibilities and results.

5.4 Cumulative impacts

5.4.1 Introduction to Cumulative Impacts

A cumulative effects analysis is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The concept behind cumulative effects analysis is to capture the total effects of many actions over time that would be missed by evaluating each action individually. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful.

The information presented in Section 4.0 (Affected Environment) describes the relevant history, natural history and current status of valued ecosystem components (VECs) that helps characterize the environmental baseline against which to evaluate cumulative effects and serves as a starting point for the cumulative effects analysis. Section 5.4.2 describes the magnitude and extent of cumulative impacts from past, present, and reasonably foreseeable future fishing actions for each VEC. The effects from non-fishing actions are summarized in Section 5.4.3, and Table 127 combines these two sections and provides an overall summary of the cumulative effects of the past, present, RFFA for fishing and non-fishing actions on each VEC affected by this management plan.

Section 5.4.4 focuses on the overall cumulative effects of the proposed action. The cumulative effects of each measure in the proposed action are summarized in Table 128 through Table 132, as well as a summary of the potential direct/indirect effects of the proposed action (summarized from Section 5.0). Together with past, present, and reasonably foreseeable future fishing actions as well as factors external to the scallop fishery that affect the physical, biological, and socioeconomic resource components of the scallop environment the cumulative effects of the proposed action are described in the following sections.

Geographic and Temporal Scope

The geographic scope of the analysis of impacts to scallop and fish species and habitat for this action is the range of the fisheries in the Western Atlantic Ocean, as described in the Affected

Environment and Environmental Consequences sections of the document (Sections 4.0 and 5.0). For endangered and protected species the geographic range is the total range of each species (Section 4.3). The geographic range for the human environment is defined as those fishing communities bordering the range of the scallop fishery (Section 4.0) from the U.S.-Canada border to, and including North Carolina.

In terms of past actions for fisheries, habitat and the human environment, the temporal scope of this analysis is primarily focused on actions that have taken place since 1994 when the groundfish closed areas were implemented by the Multispecies FMP. This timeframe was selected because this framework is considering access into portions of the closed areas. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis examines the period between implementation of this framework (expected in January 2006) and the next biennial framework action.

Valued Ecosystem Components

The cumulative effects analysis focuses on valued ecosystem components (VECs). For actions prior to Amendment 10, the VECs used are Resource, Habitat, and Community Benefits. For Amendment 13 and later actions, the VECs used are:

1. Sea scallop resource
2. Non-target species (incidental catch and bycatch)
3. Endangered and other protected species
4. Habitat, and
5. Human environment, including the economics of the fishery and fishing communities

NOAA Fisheries staff determined that the 5 VECs (target species, non-target species, protected species, habitat and communities) are appropriate for the purpose of evaluating cumulative effects of the proposed action based on the environmental components that have historically been impacted by fishing, and on statutory requirements to complete assessments of these factors under the Magnuson-Stevens Act, Endangered Species Act, Marine Mammal Protection Act, Regulatory Flexibility Act, and several Executive Orders. The VECs are intentionally broad (for example, there is one devoted to protected species, rather than just marine mammals, and one on habitat, rather than Essential Fish Habitat) to allow for flexibility in assessing all potential environmental factors that are likely to be impacted by the action. Both the direct/indirect impacts and the cumulative impacts of the proposed action on each VEC are described in Table 128 through Table 132.

While subsistence fishing would ordinarily fall under the “communities” VEC, no subsistence fishing or Indian treaty fishing take place in the area managed under this FMP. The vessels participating in the scallop fishery must comply with all federal air quality (engine emissions) and marine pollution regulations, and, therefore, do not significantly affect air or marine water quality. Consequently, the management measures contained in this action would not likely result in any additional impact to air or marine water quality and thus, are not considered in this analysis.

5.4.2 Past, Present and Reasonably Foreseeable Future Actions Related to Fishing Activities

5.4.2.1 Sea Scallop Resource and Non-target Species

Scallop FMP Past and Present Actions

The Council established the Scallop FMP in 1982 and later implemented several Amendments and Framework Adjustments to modify the original plan. See Section 2.2.1 for a detailed description of past and present actions. In general, the fishery is now limited access managed primarily by DAS and other controls such as crew limits and gear restrictions.

Summary of Impacts

The cumulative impacts of past and present management actions have resulted in substantial effort reductions in the scallop fishery. Sea scallop biomass has increased steadily since 1999. It is estimated that area rotation management will end overfishing and provide a healthy resource for scallop fishermen to harvest for the long-term.

Other FMPs Past and Present Actions

The primary action in other FMPs that has impacted the scallop fishery is the closure of the Georges Bank groundfish mortality closed areas (Closed Area I, II and Nantucket Lightship). In 1994 these areas were closed to scallop gears year-round. Since then, there have been several scallop frameworks (see discussion above under scallop actions) that have provided limited access into portions of the closed areas.

Reasonably Foreseeable Future Actions

Several reasonably foreseeable future federal fishery management actions may affect the scallop fishery. These include:

Amendment 11 to the Scallop FMP

The Council plans to develop an amendment that would focus on controlling fishing mortality in the open access sector of the scallop fishery. (Currently, any vessel may enter the fishery by obtaining a general category permit.) This amendment is expected to allocate a part of the scallop catch to boats that do not have a limited access permit. It might or might not include an additional limited access program for some or all vessels currently having a general category permit and/or set a TAC for vessels that currently do not have limited access permits. It also might include effort controls for an additional limited access category if the general category fishery is not managed under a "hard" TAC. The Council plans to initiate work on this Amendment in 2006; therefore, it is still early to predict the impacts. However, probable results of the amendment are: 1) direct controls (effort or TAC) on fishing mortality for most all of the general category fishery and 2) a cap on future growth in this fishery. This action is intended to control general category scallop effort, which in the long term will have positive impacts on the scallop resource by preventing overfishing.

Amendment 12 to the Scallop FMP

Recent court rulings on Amendment 13 to the Multispecies FMP, Amendment 10 to the Scallop FMP, and on Frameworks 16/39 to the Scallop and Multispecies FMP have clarified requirements regarding standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in a fishery. In particular, the Court, in Oceana v. Evans, has remanded Amendment 10 to the Scallop FMP to NMFS to address SBRM in accordance with the Court's ruling. The Council intends to address the remand regarding SBRM for the scallop fishery on a comprehensive manner in a separate amendment to the Scallop FMP. This action will improve the bycatch reporting program used to monitor the scallop fishery, having indirect benefits for the resource and fishery as a whole.

Next Scallop Biennial Adjustment (FY2008 and FY2009)

Since Amendment 10, scallop management is adjusted every other year. Framework 18 proposes measures for fishing years 2006 and 2007, and another framework will have to be approved in the near future to set specifications for fishing years 2008 and 2009. The measures that will be considered in this framework have not been identified yet so it is difficult to predict the impacts.

5.4.2.2 Threatened, Endangered and Other Protected Species

The following summarizes the cumulative impacts to threatened, endangered, and other protected species.

Past and Present Actions

Before 2001, there were only three known interactions between sea turtles and scallop dredge gear. In the early 1990's, 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 related to fishing effort, sea turtles may have benefited from reductions of fishing effort allocations in Amendments 4 and 7. During this time, DAS use declined from 40,490 DAS in 1993 to 23,074 DAS in 1999, before increasing to 30,082 DAS in 2003. The amendments and intervening framework adjustments also made other management changes, including new gear restrictions, but 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 has been initiated to identify potential gear modifications and changes in fishing that could reduce interactions in the fishery.

Reasonably Foreseeable Future Actions

The main goal of Amendment 10 to the Scallop FMP was to focus scallop fishing effort in areas where biomass is greatest. Therefore, actual fishing time is likely to be reduced, as the overall catch per tow increases. Scallop management areas will be monitored through annual scallop surveys for scallop biomass and growth rates, so that when biomass in a closed area is high and the growth rate drops off (i.e. the scallop resources are at maximum levels in the area) it would be opened. Conversely, closings will occur when the reverse situation is occurring (low biomass and high growth rate indicating a depleted scallop resource in the area). Scallop Framework Adjustment 18 proposes these types of modifications to the FMP.

Certain general statements can be made regarding areas encompassing several scallop management units. For example, as an update to previous NEFMC and NMFS documents, sea turtles are known to interact with scallop dredge gear in the Georges Bank access areas (See Section 4.0). Opening those areas to scallop fishing may have less effect on sea turtles than scalloping activities in the Mid-Atlantic regions where turtles are more seasonally abundant. Effort shifts to the New England region may have the effect of reducing risks to sea turtles overall if any associated effort shifts do not compromise the potential benefits.

It also must be realized that a reverse shifting of effort from a low sea turtle area such as Georges Bank, to a high use area like the mid-Atlantic will likely occur at some time in the future as the Georges Bank scallop resources are depleted and the mid-Atlantic areas recover. Accordingly, impacts to protected species could shift back and forth over the years under the management scheme being implemented under Amendment 10. The turtle interactions seen now are likely to shift down as the industry moves to the east and north, but are also likely to shift back up at some point in the future as scallop resource levels change. Since modifications to NEFMC management actions will occur through framework adjustments, they will undergo further scrutiny to more accurately discuss, evaluate and reduce impacts to protected species.

The most recent Biological Opinion issued by the NMFS for the sea scallop fishery 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 16/39 were likely to adversely affect, but not jeopardize the continued existence of loggerhead and leatherback sea turtles. Re-initiation of the Section 7 consultation will occur if the incidental takes as allowed in the ITS are exceeded or as new information becomes available to change the conclusion of the Biological Opinion.

Re-initiation of the Section 7 consultation occurred on November 1, 2005 based on new information concerning takes of sea turtles in the trawl component of the scallop fishery, new information on the species observed captured in scallop fishing gear and the location of observed takes. The consultation did not change the 2004 conclusion. Should incidental takes as allowed in the ITS be exceeded or as new information becomes available to change this conclusion, however, re-initiation will again occur.

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 are 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 effect of contaminants on turtles is 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).

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 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.

NMFS has also recently 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 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. 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).

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 is 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, NMFS issued new 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 37° 19.0' N. lat. and west of 76° 13.0' W. long., and all waters south of 37° 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 new 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).

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. 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 35° 46.3' N. lat., north of 35° 00' N. lat., and east of 76° 30' W. long.

Other recent 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.

Anticipated Research - 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, video work 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. It is being conducted on vessels that would be fishing regardless of participation in the study; therefore, the activity is not expected to alter fishing practices and will not likely impact the physical, biological, habitat, or human community components of the ecosystem.

5.4.2.3 Habitat

Past and Present Actions

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 a long term also results in discernable changes in benthic communities, which involve a shift from larger bodied long-lived benthic organisms for smaller shorter-lived ones. This shift also can result in loss of benthic productivity and thus biomass available for fish predators. 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 a high natural dynamic nature to these bedforms, to a high degree of impact to hardbottom areas such as bedrock, cobble and coarse gravel, where the substrate and attached epifauna are more stable.

Use of trawls and dredges are common in inshore and offshore areas and somewhat less common in riverine 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. 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 contact with the bottom. And total DAS allocated under Amendment 10 were reduced, which had additive benefits for EFH by reducing overall scallop fishing effort. It should be noted that sea scallop EFH is not considered adversely affected by dredge or otter trawl fishing effort.

Reasonably Foreseeable Future Actions

EFH Omnibus Amendment

An EFH Omnibus Amendment is currently under development for all of the Council's FMPs. The purpose of the amendment is to review and revise EFH components of the FMPs and to develop a comprehensive EFH management plan that will successfully minimize adverse effects of fishing on EFH through actions that will apply to all Council-managed FMPs. The Council is considering several measures for inclusion in the Omnibus Amendment, including a review and update of the following: (1) description and identification of EFH; (2) non-fishing activities that may adversely impact EFH; (3) identification and consideration of new Habitat Areas of Particular Concern; and (4) integration of

alternatives to minimize any adverse effects of fishing on EFH. While it is possible that the Council would recommend measures that could impact scallop EFH, because the amendment is in the early stage of development, it is not possible to predict impacts to the scallop fishery with any certainty.

5.4.2.4 Human Communities

Past and Present Actions

Overall, the long-term cumulative effects of the past actions, including Amendment 4 and Amendment 7 to the Sea Scallop FMP, were positive for the scallop fleet and infrastructure. Amendment 4 (1994) instituted a limited access program and established a fishing effort reduction schedule in order to lower scallop fishing mortality and increase yield. Framework 1 reduced the maximum crew limit from 9 to 7 in order to lower the fishing mortality on small scallops. Although these actions were successful in lowering fishing effort and mortality in the scallop fishery, they had negative impacts on communities in the short-term. During the period 1994 -1998 following the implementation of Amendment 4, scallop fleet landings and revenues declined considerably due to the high fishing effort and unsustainable landings during the previous periods, combined with the effort reduction measures of Amendment 4 and closure of the Georges Bank groundfish areas to scallop fishing by Amendment 7 to the Groundfish FMP. Scallop landings reached their lowest level in a decade with only about 11.2 million pounds in 1998 fishing year, which was less than one half of what it had been during the period 1987-1992. The fleet revenue also declined to \$67 million (in 2004 prices, Table 37) in the same year.

Amendment 7 (1998) revised the DAS-reduction schedule in order to meet the mandates of the Fisheries Sustainable Act of 1996. As the scallop resource rebounded due to the effort reduction measures of Amendment 7 and groundfish area closures since 1994, combined with an above-average recruitment, the scallop landings increased dramatically to more than 21 million pounds in 1999 and to over 33 million pounds in 2000 fishing year. The opening of southern part of CAII to scallop fishing in 1999 by Framework 11, and later, extension of access to parts of Nantucket Lightship Area and Closed Area I by Framework 13 played an important role in increasing fleet revenues and economic benefits from the scallop resource. Framework 14 action revised the DAS schedule in Amendment 7 and increased the allocations to be consistent with the recent improvements in the scallop abundance levels. Also Hudson Canyon and VA/NC areas were reopened to scallop fishing through a controlled access program. This program was continued in 2002 by Framework 15. The cumulative impacts of these actions on the human environment were positive. The landings reached record levels, to 50 million lb. in 2002 and 54.6 million lb. in 2003 fishing years and fleet revenues increased to \$193 million in 2002 and \$225 million in 2003 fishing years (in 2004 constant prices, Table 37).

Amendment 10 to Scallop FMP was adopted in 2004 to implement rotation area management and allocate DAS by specific area among several other measures minimize impacts on EFH and bycatch. 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. The cumulative impacts of these actions on human environment continued to be positive. Not only landings increased further to over 62 million lb. in 2004, but the inflation adjusted value of scallop revenue exceeded over \$307 million first time in the last 20 years.

Therefore, past and present actions had positive cumulative impacts on vessels owners, crew and their families in the scallop fishery by increasing their fishing revenues, incomes and standard of living. These 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 increase in the gross profits of the scallop vessels and in crew incomes have positive economic benefits on these sectors indirectly through the multiplier impacts. There were no other Federal or non-Federal Actions that had any significant impacts on the scallop fleet and infrastructure.

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.

Reasonably Foreseeable Future Actions

Liquid natural gas (LNG) terminals.

As discussed further below in Section 5.4.3, there are approximately 11 LNG projects in various stages of the approval process. Depending on the location of the project, a range of impacts can occur, including impacts to communities. Due to the potentially hazardous nature of the facilities (LNG is transported via tanker to specialized terminals), security zones are generally established around LNG facilities. This can restrict access to areas traditionally utilized for fishing and shellfishing, essentially closing some areas to fishing and thus reducing fishing opportunities.

5.4.3 Summary of Past, Present, and Reasonably Foreseeable Future Actions Related to Non-Fishing Activities

Past and Present Actions

A comprehensive evaluation of non-fishing impacts to the multispecies fishery was conducted in Amendment 10. For fish habitat, non-fishing effects were reviewed in the Essential Fish Habitat Amendment for Scallops prepared by the NEFMC (Amendment 9 to the Scallop FMP, NEFMC 1998). Table 50 below summarized the potential effects of numerous chemical, biological, and physical effects to riverine, inshore, and offshore fish habitats. In general, the closer to the coast, the greater the potential for adverse impact to fishery resources and EFH. For the offshore area, with the exception of events such as oil spills and algae blooms, which can spread over large areas, moderate effects were generally localized to a well-defined and relatively small impact area such as oil/gas mining and dredged material disposal. Thus, only small portions of fish stocks would potentially use these sparsely located areas and would be adversely affected. For example, dredged material disposal sites, usually about 1 km² in size, are managed by the U.S. Army Corps of Engineers and the U.S. EPA to minimize physical effect to the defined disposal area and allow no chemical effects at the site based on stringent sediment testing.

For sea scallops in the Northeast U.S., there are several non-fishing threats that could have a direct and/or indirect impact. Several of the items identified as non-fishing threats to fish habitat, identified in Table 50, could also pose a threat to sea scallops stocks, such as the oil spills, pesticides, and radioactive wastes. Similar to the discussion above on non-fishing impacts to fish habitat, generally the closer the proximity of sea scallops to the coast, the greater the potential for impact (although predation, a non-fishing impact, would be one threat that would occur everywhere). Sea scallops reside in both inshore and offshore areas. However, some sea scallops live out their lives closer to shore and may likely be impacted by inshore threats to a greater degree than offshore sea scallops. In the offshore areas, such effects would likely be low because the localized nature of the effects would minimize exposure to organisms in the immediate area.

The Atlantic sea scallop (*Placopecten magellanicus* (Gmelin)) is a bivalve mollusk distributed along the continental shelf, typically on sand and gravel bottoms, from North Carolina to the north coast of the Gulf of St. Lawrence (Packer et al. 1999). Large concentrations of sea scallops are found on Georges Bank and the mid-Atlantic shelf, while smaller concentrations are found along coastal Maine, in the Bay of Fundy (Digby grounds), in the Gulf of St. Lawrence, on St. Pierre Bank, and in Port au Port Bay, Newfoundland (NEFMC 2003). Atlantic sea scallops generally inhabit depths of 18–110 m but are most abundant on the continental shelf between 20 and 50 m. On occasion, they have been found at depths up to 384 m (NEFMC 2003). In the mid-Atlantic, concentrations occur within a narrow depth band

from about the 40 to the 200 m isobath, throughout the Hudson Canyon Area, and around the perimeter of Georges Bank, including the Great South Channel (NEFMC 2001). In mid-Atlantic waters, most scallops are harvested at depths of 30–100 m (NMFS 2004c).

THREATS	RIVERINE	INSHORE	OFFSHORE
Chemical			
oil	M	M	M
heavy metals	M	M	M
nutrients	H	H	L
pesticides	M	M	L
herbicides / fungicide	M	M	L
acid	H	M	
chlorine	M	M	
thermal	M	M	
metabolic & food wastes	M	M	
suspended particles	M	M	L
radioactive wastes	L	M	M
greenhouse gases	M	M	M
Biological			
nonindigenous / reared species	M	M	M
nuisance / toxic algae	M	H	M
pathogens	M	M	M
Physical			
channel dredge	M	H	
dredge and fill	H	H	
marina / dock construction	M	H	
vessel activity	M	H	L
erosion control			
bulkheads	M	M	
seawalls		M	
jetties		M	
groins		M	
tidal restriction	M	H	
dam construction / operation	H	M	
water diversion			
water withdrawal	H	M	
irrigation	M	M	
deforestation	H	M	
mining			
gravel/mineral mining	M	M	M
oil/gas mining	L	M	M
peat mining	L		
debris	M	M	M
dredged material disposal	L	M	M
artificial reefs	L	M	M

Table 126- Potential non-fishing threats to fish habitat in the New England region prioritized within regions (H = high; M = moderate; L = low)²

¹ From NEFMC (1998)

² Prioritization developed by compilation of *EFH Technical Team* survey

Reasonably Foreseeable Future Actions

As discussed in more detail in the Amendment 10 FSEIS, scallops are particularly susceptible to changes in water quality and clarity, as well as thermal shock, or moderate to significant burial by sediments. Therefore activities in about 20 to 40 fathoms of water (with shallower areas in the Gulf of

Maine) that cause a degradation of water quality, increases in turbidity, thermal shocks, or burial could have a cumulative effect on the scallop fishery and the scallop resource. For example, changes in the environment that cause changes in growth rates, natural mortality, of meat yield, could have a cumulative effect on rotation area management. Areas might have to re-open quicker than anticipated to catch scallops earlier if the mortality rate increases due to an offshore activity. Such an event could also decrease the expected benefits of the proposed area access program. Slower growth rates could likewise decrease the potential benefits of rotation area management.

Types of activities could include construction in the nearby marine environment, sand dredging and ocean dumping, oil and gas exploration, and burial of pipelines or telecommunication cables across important scallop beds. At the present time, the Council is not aware of pending applications for Federal permits of these types in the scallop resource areas. There has been discussion with the Council in the past two years about a potential construction of a gas pipeline near or on Georges Bank, but this is in the preliminary stages of evaluation and may require some forethought about potential effects on scallop resources. Two types of projects that are being proposed in the area are liquid natural gas terminals and wind power facilities; these projects are described in more detail below, as well as the potential cumulative impacts on the scallop resource and fishery.

Liquid natural gas (LNG) terminals

There are a number of LNG projects in various stages of the approval process (i.e., existing with approved expansions, approved, proposed, or planned) in the northeast region of the U.S. Currently, only two LNG projects are in operation in the Northeast region, in Everett, MA and Cove Point, MD. LNG facilities are currently being proposed or planned for construction both offshore and onshore. Offshore projects include: two projects within Massachusetts Bay, and one in Long Island Sound. Onshore projects include Outer Brewster Island in Boston Harbor; Pleasant Point, ME; Fall River, MA ; Logan Township, NJ; Philadelphia, PA; and an expansion of an existing facility in Cove Point, MD.

Onshore facilities and those within state waters are regulated by the Federal Energy Regulatory Commission (FERC). Offshore facilities within federal waters are regulated by the US Coast Guard under the Deepwater Port Act. General issues of concern regarding LNG terminals include dredging for navigational access to the site. Dredging can result in direct loss of fish and/or shellfish habitat and can elevate levels of suspended sediment within the water column which can impact various life stages of fish and shellfish. Intakes of seawater for regassification purposes can impinge and entrain ichthyoplankton and zooplankton resources. Other issues include the alteration of temperature regimes due to discharge of cooler water resulting from regassification, exclusion of commercial and recreational fishing activities from deepwater ports and benthic impacts related to pipelines.

Wind Power Facilities

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 130-turbine wind farm on Horseshoe Shoals, located within Federal waters of Nantucket Sound. The CWA project will occupy an area of approximately 24 square miles with turbines approximately 1/3 mile apart. The turbines will be interconnected by cables, which will converge at an electrical service platform and relay the electricity to shore via cable. A second project is proposed by the Long Island Power Authority (LIPA) off Long Island, New York. Changes to navigational hazards in and around Nantucket Sound may have an impact on safety in the scallop fishery, but the nature of the impacts will depend on the location and size of the windfarms. For example, scallop vessels that transit through Nantucket Sound from New Bedford and other MA ports may have to change their steaming routes and factor in additional time to navigate around structures in the water.

The Army Corps of Engineers has developed a DEIS for the proposed Cape Wind Associates (CWA) project on Horseshoe Shoal. The Energy Act of 2005 has transferred authority from the Corps of Engineers to the Department of the Interior's Minerals Management Service (MMS), and includes the authority to lease lands associated with alternative energy. MMS will be developing a distinct NEPA document for the proposed CWA project. If constructed, the turbines may preempt other bottom uses in the area. 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; changes to species assemblages within the area from the introduction of vertical structures, and depending on the burial depth of the cables, projects have the potential to conflict with trawling operations in the area.

Table 127 – Summary of past, present, and reasonably foreseeable future actions related to fishing and non-fishing actions

Alternative or Action	Cumulative Effects on Scallop Resource	Cumulative Effects on Non-target Species	Cumulative Effects on Protected Species	Cumulative Effects on Habitat	Cumulative Effects on Communities
Non-Fishing Entities and Actions					
<ul style="list-style-type: none"> Inshore 	Negative, moderate	Negative, moderate	Unknown – possibly negative	Negative, moderate-high	Chemical/biological – negative Physical – positive, short-term; possibly negative long-term
<ul style="list-style-type: none"> Offshore 	Negative, low	Negative, low	Unknown	Negative, low	Unknown
Past Actions					
<ul style="list-style-type: none"> Amendment 4 to the Scallop FMP Amendment 7 to the Scallop FMP Framework 11, 13, and 14 	Positive, moderate-high	Positive, moderate - high	Positive-low	Positive, low	Short-term negative, high Long-term positive, low
Present Actions					
<ul style="list-style-type: none"> Amendment 10 to the Scallop FMP 	Positive, high	Positive, low	Positive, low	Positive, moderate	Short-term negative, high Long-term positive, low
<ul style="list-style-type: none"> Amendment 13 to the Multispecies FMP Scallop/Multispecies Frameworks 16/39 	Positive, high	Positive, low	Positive, low	Positive, moderate	Short-term positive Long-term positive
RFFAs					
<ul style="list-style-type: none"> EFH Omnibus Amendment 	Unknown	Unknown	Unknown	Unknown	Unknown
<ul style="list-style-type: none"> ALWTRP DEIS 	None	None	Positive, high	None	Short-term negative, low Long-term, negligible
<ul style="list-style-type: none"> LNG Terminals 	Unknown, possibly negative	Unknown, possibly negative	Unknown	Short-term negative, moderate Long-term unknown	Unknown, possibly negative
<ul style="list-style-type: none"> Offshore Wind Energy Generation 	Negligible	Negligible	Short-term negative Long-term negligible	Short-term negative, moderate Long-term negligible	Unknown, possibly negative

5.4.4 Cumulative Impacts of the Proposed Action

The following analysis summarizes the cumulative effects of the proposed action on the VECs identified in Section 5.4.1. For each VEC, a table has been completed summarizing both the direct/indirect impacts of the proposed action on each VEC and the cumulative impacts. A significance determination of the cumulative effect of each measure is identified in **boldface**. The determinations range from “negative high” to positive high.” The list of possible determinations used for this analysis are: *unknown, none, negative, negative low, neutral, positive low, and positive*.

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. The paragraphs below describe the overall cumulative effects based on information summarized in Table 128 through Table 132.

5.4.4.1 Sea scallop resource

This analysis has considered the potential impacts of the proposed action on the sea scallop resource in combination with relevant past, present, and reasonably foreseeable future actions. Overall, the majority of measures proposed in this action are designed to make rotational area management more flexible, which improves the overall performance of the program, having positive long-term impacts on the resource (See Table 128). Therefore, most of the measures in the proposed action have positive cumulative effects on the scallop resource. To point out a few, closing the Delmarva Area is expected to have high positive cumulative effects because this measure will protect small scallops, improving overall yield from the resource in the long-term. Likewise, measures to allocate effort in the Elephant Trunk Area will have positive cumulative effects. Limiting open area effort to 20,000 DAS is expected to have positive cumulative effects by keeping overall fishing mortality low and improving yield-per-recruit. One measure that may have some negative cumulative effects on the scallop resource is eliminating the crew limit for controlled access area trips, if LPUE in the areas declines. The potential to target and retain smaller scallops with more crew could increase mortality, unless large scallops are very abundant in the access areas and fishing behavior and size selection is unaffected by eliminating the crew size restriction.

None of the measures included in the proposed action are expected to have significant cumulative impacts on the sea scallop resource.

5.4.4.2 Non-target species

This analysis has considered the potential impacts of the proposed action on non-target species (small scallops as well as finfish and other bycatch species) in combination with relevant past, present, and reasonably foreseeable future actions. In general, all the measures included in the proposed action have positive or neutral cumulative impacts on non-target species (See Table 129). Many of the measures proposed 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. Derby-style fishing can lead to higher levels of bycatch, and several measures in this action are proposed to limit that activity. 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 to 20,000 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.

None of the measures included in the proposed action are expected to have significant cumulative impacts on non-target species.

5.4.4.3 Protected and Endangered Species

This analysis has considered the potential impacts of the proposed action on protected and endangered species in combination with relevant past, present, and reasonably foreseeable future actions. Similar to the other VECs described in Section 5.4.3, non-fishing impacts from activities occurring now and expected in the future to protected resources are largely unknown and unquantifiable.

Biological resources, in particular sea turtles, have been, are, and will continue to be negatively impacted by a variety of past, present, and future activities. These cumulative impacts may be impacting the recovery of the species, although the extent cannot be quantified. It is unknown whether the measures to reduce impacts on sea turtles in Framework 18 will have positive impacts. Other measures in the proposed action will likely reduce negative impacts on sea turtles resulting from fishing activities.

The activities that are negatively impacting sea turtles should continue to be addressed to ensure sea turtles are protected. One of the goals under the NMFS Sea Turtle Strategy is to develop and implement plans to reduce the take of sea turtles in Atlantic Ocean and Gulf of Mexico fisheries. Implementation of these plans will have a net beneficial impact to sea turtles. NMFS also intends to continue outreach efforts to educate fishermen regarding sea turtles. The future anticipated research will likely further our knowledge on the nature of the interaction between sea turtles and sea scallop dredge gear, potentially leading to the implementation of different measures affecting the sea scallop fishery and having a beneficial impact to sea turtles. The Sea Turtle Strategy, outreach efforts, and anticipated research all address activities that negatively impact sea turtles and are expected to have a beneficial impact on sea turtles.

None of the measures included in the proposed action are expected to have significant cumulative impacts on protected and endangered species.

5.4.4.4 Essential Fish Habitat

This analysis has considered the potential impacts of the proposed action on essential fish habitat in combination with relevant past, present, and reasonably foreseeable future actions. The cumulative effect of this action on habitat is expected to be minimal. Amendment 10 to the Atlantic Sea Scallop FMP and Amendment 13 to the Northeast Multispecies FMP adopted a suite of measures that minimized, to the extent practicable, the adverse effects of fishing on EFH from gears used in the scallop fishery. These measures included areas restricted to all bottom-tending mobile gear and benefits that accrue from the effort reductions and other provisions of the amendment.

The proposed action specifies allocation, timing and location measures for both the controlled access areas as well as the open access areas. In addition, other administrative measures are proposed. It is important to note that none of the measures allow for access to the

Habitat Closed Areas established by either Amendment 10 to the Atlantic Sea Scallop FMP or Amendment 13 to the Northeast Multispecies FMP.

Although the Omnibus EFH Amendment could recommend additional measures to minimize the adverse effects of fishing on EFH, because the amendment is in the early stage of development, it is not possible to predict the impact of that action. The only other known threats to habitat or EFH could result from non-fishing impacts. In general, impacts from non-fishing activities are localized, such as in the disposal of dredged material or the possible construction of LNG facilities and wind farms and, in the case of pollution, typically have a greater potential for impacts closer to the coast. Thus, negative non-fishing impacts are less likely to be additive in offshore areas where the majority of the proposed measures would affect (Table 126).

This impacts of the proposed measures, described in this framework action, when combined with other past, present and reasonably foreseeable actions described in this assessment, would not result in significant cumulative impacts to habitat or EFH.

None of the measures included in the proposed action are expected to have significant cumulative impacts on essential fish habitat.

5.4.4.5 Human Environment

This analysis has considered the potential impacts of the proposed action on the human environment (economic and social effects) in combination with relevant past, present, and reasonably foreseeable future actions. Overall, the majority of measures proposed in this action are designed to make rotational area management more flexible, which improves the overall performance of the program, having positive long-term impacts on the resource and fishery (Table 132). Therefore, most of the measures in the proposed action have positive cumulative effects on the human environment. Area rotation and controlled access area management had positive economic and social impacts in the past. The revised access schedule for Georges Bank will augment these positive impacts by allocating more access trips consistently over the years. Closing the Delmarva area will maximize yield over the long-term, thus it will have beneficial cumulative impacts on the human environment by increasing long-term landings, economic and social benefits. However, some vessels that mainly fish in the Mid-Atlantic may have some short-term negative economic impacts. Several components of the Elephant Trunk Area measures may have negative cumulative impacts on the human environment. The precautionary number of trips allocated to this area may have negative short-term impacts, but positive impacts overall by reducing the unexpected declines in scallops landings and revenues by lowering the risk of over-fishing. The two-month seasonal closure of ETA may have short-term negative cumulative impacts, but they are outweighed by the long-term positive impacts. If seasonal closures minimize bycatch and interactions with protected species, fewer restrictions will be put on the fishery in the long-term.

None of the measures included in the proposed action are expected to have significant cumulative impacts on the human environment.

5.4.4.6 Summary of Cumulative Impacts

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 adverse impact. In summary, the sea scallop resource, non-target species, protected species, habitat, and the human community 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, overall improving flexibility and performance of the program, which will have positive impacts on the long-term success of the program at preventing overfishing and achieving optimum yield.

Table 128 – Summary of cumulative impacts of the proposed action on the **sea scallop resource**

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on the scallop resource
Area Rotation Measures and Allocation			
AREA SPECIFIC LIMITS			
Max # of trips and possession limit (SQ)	3.3.1.1.2 5.1.1.1	The allocations and possession limits ensure that the estimated mortality targets associated with optimum yield are met, preventing overfishing and depletion of the scallop resource.	The alternative would continue a successful program that has been in place since 1999. It has had a positive effect on the scallop resource by allowing vessels to take time to fish in areas with larger scallops, increasing yield-per-recruit and reducing mortality associated with a TAC. At the same time, these measures have reduced fishing time and area swept per DAS, reducing non-catch mortality of scallops. Management in other FMPs or other regulations that pertain to vessels have not had an effect on the allocation program. Positive
GEORGES BANK ACCESS			
Contingency Schedule	3.3.1.2.3 5.1.1.2.5	This area rotation alternative would prevent overharvesting of the available scallops in CA I while closing CA II in 2007 when the 2003 year class first becomes vulnerable to capture by dredges. The alternative would improve yield compared to No Action and the status quo.	The Georges Bank area access program allows highly regulated and restricted fishing of available scallops in ways that limit impacts on groundfish and essential fish habitat. Other parts of the Georges Bank closed areas are unavailable for fishing, despite having large scallops, due to the EFH closures. Neutral
Additional open DAS for YT TAC	3.3.1.2.4 5.1.1.2.5	The alternative is designed to have minimal effect on scallop mortality because the ratio is set to allow the catch of an equal number of scallops as the trips would have taken in controlled access areas.	Shifting effort to open areas due to the yellowtail flounder closures will not have a long-term overall effect on the scallop resource, unless the areas close so early that most of the access area effort is reallocated to the open areas. Limits on groundfish catches have the potential to limit access to large scallops and reduce yield. Negative low
HUDSON CANYON AREA			
Extend duration of program until 2008	3.3.1.3.1 5.1.1.2.6	This action would have positive impacts on the scallop resource by reducing mortality in 2005 and postponing trips to 2006 and 2007 when the vessels would catch 18,000 lbs. of scallops per trip at a larger size.	This action would improve the performance and benefits of area rotation. Other FMPs and regulations will have minimal effect, as long as closures do not overlap the HCA. Positive low.
ELEPHANT TRUNK AREA (ETA)			
Precautionary trip allocations – max. 5 trips	3.3.1.4.1.1 5.1.1.2.7	The initial five trip allocation and TAC is lower than normal for a newly re-opened rotation area to prevent the allocations from exceeding an F=0.32 target.	This action applies some experience from other controlled access area programs where biomass projections have been optimistic and the TACs as a result were too high to achieve the mortality target. Rotation area management for the ETA captures the benefits of the 2004-2006 closure. Positive
Re-open January 1, 2007	3.3.1.4.2.1 5.1.1.2.7	Opening the ETA two months earlier than planned would reduce the intensity of fishing effort during the spring of 2007. On one hand, this action could reduce incidental scallop mortality caused by 'souring' of the bottom by large amounts of viscera. On the other hand, the action sacrifices some yield that would otherwise be realized by allowing more scallops to grow during the spring of 2007, reducing the average	The additional two months will help to reduce the intensity of fishing effort at one time and a potential negative impact on scallop prices, improving the performance of area rotation. Other FMPs and regulations could have an effect on the program if quotas and seasons require the vessels to fish in other fisheries during January and February.

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on the scallop resource
Seasonal closures from Sept 1-Oct31	3.3.1.4.3.3 5.1.1.2.7	scallop size and increasing mortality associated with the TAC. The seasonal closure would shift effort to months when water and deck temperatures are lower, reducing scallop discard mortality.	Positive low The seasonal closure will have minimal effect on achievement of optimum yield from ETA scallops. It could have a positive effect on long-term yield by reducing discard mortality when surface temperatures are warmest. Other FMPs and regulations could have a negative effect if they prevent vessels from fishing elsewhere during these two months, but most vessels are expected to target scallops elsewhere using open area DAS and Georges Bank area allocations. Positive low.
PROCEDURES TO ADJUST ETA			
Rulemaking	3.3.1.5.1 5.1.1.2.8	The procedure would prevent overharvesting the scallop resource in the ETA if the current biomass projections are overly optimistic. It would prevent depletion of the ETA scallop resource and loss in long-term yield.	Adjustment of trip allocations based on 2006 surveys (possibly including cooperative industry surveys) would ensure that the rotation area management program performs as expected, improving the success of the program. Other FMPs and regulations are unlikely to have an effect on the performance of the ETA access program, unless they prevent vessels from fishing in the area. Positive
DELMARVA AREA			
Close when ETA opens in 2007	3.3.1.6.1 5.1.1.2.9	Closing the DMV Area in 2007 will protect an above average 2003 year class when it becomes vulnerable to capture by dredges. The action will maintain high scallop biomass and boost long-term yield by about 15% compared to No Action.	Closures where small scallops are abundant would continue the area rotation program, improving the yield from the resource while minimizing the effects on the biological environment. Other FMPs and regulations are unlikely to have an effect, unless they prevent vessels from fishing in the area when it re-opens as a controlled access area in 2010-2012. Positive
Open Area Management			
DMV Closure – 20K open	3.3.2 5.1.1.3	Limiting open area DAS use to 20,000 will help prevent localized depletion and overfishing, which over the long run reduces yield. The action will also help prevent LPUE on open area DAS from declining.	Limiting open area effort to 20,000 DAS, even if the overall mortality is less than $F=0.20$ will have long-term benefits by reducing open area mortality and improving yield-per-recruit. Other FMPs and regulations might have a positive effect if other activities affect scallop mortality and growth. Positive
Limited Access Crew Limits			
Eliminate 7 crew limit for access trips	3.3.3.1 5.1.1.4	Eliminating the crew limits on controlled access area trips have no effect on landings by weight. There is a risk that liberalizing the crew limit will enable vessels to fish on smaller scallops when LPUE declines and reduce the cull size. The effect of this is to increase mortality associated with the TAC, possibly overshooting the targets associated with optimum yield. However, as long as controlled access areas contain a high abundance of large scallops, the risk will be small.	The potential to target and retain smaller scallops with more crew could increase mortality associated with the TACs and reduce long-term yield. Changes in fishing behavior and size selection need to be monitored and factored into future assessments and TAC estimates. IRS regulations on self-employment may keep vessels from carrying more than 9 crew persons and have a mitigating positive effect. Negative low
Trip Exchange Deadline			
Eliminate June 1 deadline	3.3.4.1 5.1.1.5	This action is not expected to have any biological effect, as long as the trips and effort can be monitored and fishing does not exceed the limits.	This action improves the flexibility of the controlled access area management program, increasing the likelihood that the FMP can continue and expand the rotation area management program to other areas. Changes in other FMPs and regulations

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on the scallop resource
			introduce uncertainties and business risk which is alleviated by eliminating this deadline. Positive low
Controlled Access Area Trip Exchanges			
1 to 1 exchange for GB2006 and ET2007	3.3.5.1 5.1.1.5	These measures are not expected to have any biological effects, as long as the trips and effort can be monitored and fishing does not exceed the limits.	Expanding the one to one exchanges improves flexibility and performance of the rotation area management program. Positive low
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	3.3.5.3 5.1.1.5		
Status Quo - 1 to 1 exchange of access area trips for trips in other access areas that are open	3.3.5.4 5.1.1.5		
Broken Trip Exemption Program			
60 day carry over of compensations trips	3.3.6.1 5.1.1.5	Like the open area DAS carry forward provision, this measure is not expected to have any substantial biological effect on the resource. There may be some difference in scallop mortality from the effort shift, but most effort would shift from Jan-Feb to Mar-Apr or Jun-Jul. The shift would be more likely to allow scallop growth and increases in meat yield, reducing mortality.	Adjusting the broken trip provision improves flexibility and performance of the rotation area management program. Positive low

Table 129 – Summary of cumulative impacts of the proposed action on **non-target species**

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on non-target species
Area Rotation Measures and Allocation			
AREA SPECIFIC LIMITS			
Max # of trips and possession limit (SQ)	3.3.1.1.2 5.1.2.1	Controlled access area trips take much less time to catch and land 18,000 lbs. of scallops than the 12 allotted DAS. As a result, vessels have time to fish using best practices, seeking more valuable larger scallops and areas where bycatch is lower, avoiding catching yellowtail flounder which might close the access program when catches reach the 10% TAC. Fishing is potentially concentrated in areas with high catch per unit of effort and lower bycatch.	The status quo allocation system of controlled access area trips and scallop possession limit has been very successful, allowing fishing in areas where groundfish occur, but during times and in ways that keep bycatch low. Via Framework 39, the Multispecies FMP restricts yellowtail flounder bycatch to 10% of each stock's TAC, which closes access areas when the monitored catches reach these limits. This has a synergistic effect to induce fishing in ways keeping bycatch as low as possible. Groundfish and monkfish possession limits keep scallop vessels from targeting groundfish to any extent. Other regulations do not appear to have an effect on bycatch in the scallop fishery. Positive
GEORGES BANK ACCESS			
Contingency Schedule	3.3.1.2.3 5.1.2.2	Relative to No Action, the revised access schedule would increase fishing effort in the Georges Bank areas during 2006, and reduce effort in 2007. Shifting a trip from Closed Area I to Closed Area II in response to the court action could increase the catch rate for yellowtail flounder, and increase the possibility of a closure and a shift of unused fishing effort to open areas. This effect may be preferable to increasing levels of fishing effort in Closed Area I if available scallops are depleted and scallop catch rates drop.	Revising the area rotation schedule is expected to keep high scallop biomass levels in the access areas into the foreseeable future, partly by shifting effort away from Closed Area II in 2007 when an abundant scallop year class becomes vulnerable to fishing. Thus the areas will continue as a source to achieve optimum yield while minimizing effects on bycatch. The EFH closed areas prevent access to some areas with high scallop biomass, limiting the effectiveness of the area access system to minimize bycatch. Positive
Additional open DAS for YT TAC	3.3.1.2.4 5.1.2.2.3	The flexibility to fish unused trips in open areas is intended to limit derby-style fishing activity, when vessels fish harder in anticipation of a closure. Otherwise, derby-style fishing tends to increase bycatch, as it did during the 2000 Closed Area II fishery.	Allowing a limited effort shift into open areas without increasing overall scallop mortality increases support for rotation area management, because fishermen are not unexpectedly prevented from fishing due to closures. Other FMPs and regulations do not appear to have an impact on the effectiveness of this alternative. Positive low
HUDSON CANYON AREA			
Extend duration of program until 2008	3.3.1.3.1 5.1.2.2	Postponing trips to 2006 and 2007 will allow time for existing HCA scallops to grow, reducing total fishing time to catch the leftover 2005 TAC. Reducing fishing time will reduce bycatch of scallops and finfish.	Providing an adjustment to this program and an outlet for unused effort helps to reduce opposition to rotation area management, arising from mis-specification of the 2005 TAC from previous projections. Other FMPs and regulations do appear to have an impact on this alternative, unless they would prevent vessels from fishing in the HCA during 2006 and 2007, or increase the cost of doing so. Positive
ELEPHANT TRUNK AREA (ETA)			
Precautionary trip allocations – max. 5 trips	3.3.1.4.1.1 5.1.2.2	Taking a precautionary approach limits ETA fishing effort and therefore bycatch. Otherwise, total fishing time per trip could increase if the scallop biomass is lower than projected and scallop catch rates decline.	The precautionary allocations would prevent increases in fishing effort under the access area TAC, as happened in the HCA (2004, 2005) and in Closed Area II (2003), when the scallop biomass was over-estimated. Higher allocations would however

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on non-target species
			reduce fishing effort needed in open areas to achieve the overall fishing mortality target, having an adverse effect on bycatch elsewhere. Other FMPs or regulations are unlikely to have an effect on this alternative, unless they prevent vessels from fishing in the ETA. Neutral
Re-open January 1, 2007	3.3.1.4.2.1 5.1.2.2	This alternative could reduce the intensity of fishing effort during the spring 2007, when the ETA re-opens. Concentrated fishing effort is believed to increase bycatch and discard mortality. Otherwise, information is insufficient to assess changes in bycatch due to a two-month change in the opening date.	The flexibility to open the ETA two months early and reduce the intensity of fishing effort helps to build support for rotation area management, which in most cases reduces total fishing effort associated with optimum yield and thereby minimizes bycatch. Other FMPs and regulations are unlikely to have an effect on the alternative, unless they restrict access to the ETA or cause vessels to take ETA trips during a more abbreviated period. Positive low
Seasonal closures from Sept 1-Oct31	3.3.1.4.3.3 5.1.2.2.2	Information is insufficient to assess changes in scallop and finfish bycatch due to a 2-month seasonal closure of the ETA. Qualitatively, a seasonal closure during warmer months may benefit scallop and finfish bycatch.	Flexibility to manage controlled access areas in ways to minimize environmental effects, including those on discard mortality, make rotation area management more successful as a means to maximize yield and minimize impacts. The proposed action is expected to compliment the effectiveness of "turtle chain mats". Positive
PROCEDURES TO ADJUST ETA			
Rulemaking	3.3.1.5.1 5.1.2.2	Preventing fishing mortality from exceeding the F=0.32 area rotation target would have a positive effect on limiting bycatch, should the actual biomass be much less than currently projected.	Ensuring that area access TACs are consistent with actual biomass is expected to improve the performance of rotation area management. It has the potential for preventing unexpected increases in fishing effort and bycatch. Other FMPs and regulations are unlikely to have an effect on this action to minimize bycatch. Positive
DELMARVA AREA			
Close when ETA opens in 2007	3.3.1.6.1 5.1.2.2	Effort is likely to shift north within the Mid-Atlantic region and to Georges Bank areas, where finfish bycatch is a greater concern.	Additional rotation area management closures will continue to offer an opportunity to maximize yield while minimizing the environmental effects and impacts on bycatch. Other FMPs and regulations could have a negative effect on bycatch if they prevent scallop fishing in re-opened rotation areas. Positive
Open Area Management			
DMV Closure – 20K open	3.3.2 5.1.2.3	Limiting open area DAS use to 20,000 will prevent localized overfishing, which would otherwise cause increases in fishing per DAS, increasing bycatch. Open area DAS may be fished in any non-restricted area of the EEZ, which allows for effort shifts in response to fishing conditions in the Gulf of Maine, Georges Bank, and the Mid-Atlantic regions. Projections estimate that a greater share of the open area DAS will be fished in the Georges Bank region. Such a shift will accompany increases in total bycatch of groundfish species, which are partially protected by year round area closures.	Limits on open area DAS help keep 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. In addition, gear restrictions including 10" twine top mesh, 4" rings, and prohibitions on chafing gear and triple linking have reduced bycatch. The multispecies and monkfish possession limits reduce the incentive to fish with dredges and scallop trawls where finfish catch is high. Positive
Limited Access Crew Limits			
Eliminate 7 crew limit for access trips	3.3.3.1 5.1.2.4	Larger crews can process the catch more quickly, potentially reducing discard mortality caused by fish remaining on deck for prolonged	The crew limit has been controversial because of safety concerns, particularly on controlled access area trips when crews

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on non-target species
		periods. On the other hand, larger crews would enable vessels to fish longer during each DAS.	are worked hard to process the large catches. Eliminating the crew limit could help maintain support for area rotation, which reduces the amount of effort to catch optimum yield. Other FMPs and regulations are unlikely to impact the proposed action's effect on bycatch. Positive low
Trip Exchange Deadline			
Eliminate June 1 deadline	3.3.4.1 5.1.2.5	Unlikely to change fishing behavior or have a meaningful effect on bycatch.	More flexible rotation area management allows vessels to adapt to changing resource conditions, with exchanged trips going to vessels that can catch scallops most efficiently in each area. As such, there may be a reduction in the amount of fishing time to catch the limit, with the potential to reduce bycatch. Other FMPs and regulations are unlikely to impact the effect of this proposed action. Positive low
Controlled Access Area Trip Exchanges			
1 to 1 exchange for GB2006 and ET2007	3.3.5.1 5.1.2.5	Unlikely to change fishing behavior or have a meaningful effect on bycatch.	More flexible rotation area management allows vessels to adapt to changing resource conditions, with exchanged trips going to vessels that can catch scallops most efficiently in each area. As such, there may be a reduction in the amount of fishing time to catch the limit, with the potential to reduce bycatch. Other FMPs and regulations are unlikely to impact the effect of this proposed action. Positive low
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	3.3.5.3 5.1.2.5		
Status Quo - 1 to 1 exchange of access area trips for trips in other access areas that are open	3.3.5.4 5.1.2.5		
Broken Trip Exemption Program			
60 day carry over of compensations trips	3.3.6.1 5.1.2.6	Shifts in seasonal fishing patterns could increase bycatch, particularly for species that are more available in scallop fishing areas in the spring. Georges Bank areas where bycatch during the spring is a concern are closed until June 15, after spawning for many groundfish species. Postponing fishing from Jan-Feb to Mar-Apr or Jun-Jul would allow scallop growth and increases in meat yield, reducing fishing time per trip and potentially bycatch.	More flexibility to handle broken trips at the end of the fishing year has similar effects as described for the trip exchanges above. This action could help prevent vessels from fishing trips at the end of the year in ways that might be adversely affect bycatch and/or discard mortality. Other FMPs and regulations could have a negative effect if they prevent vessels from postponing broken trips to the next fishing year. Positive low

Table 130 – Summary of cumulative impacts of the proposed action on **protected and endangered species**

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on protected species
Area Rotation Measures and Allocation			
AREA SPECIFIC LIMITS			
Max # of trips and possession limit (SQ)	3.3.1.1.2 5.1.3.1	Allocating by trip and possession limits in the access areas may result in more trips overall, but trip lengths are shorter, reducing bottom contact time and area swept and possibly the risk of sea turtle/fishery interactions in the areas.	Overall, area rotation with possession and trip limits reduces tow and bottom contact time, resulting in less effort overall, particularly in the MA region. The access schedule results in a higher number of trips in 2006 when no access trips are available in the MA, and fewer trips in 2007 when the ETA opens under restricted access rules. A transfer of effort to NE may have positive benefits for sea turtles. Positive
GEORGES BANK ACCESS			
Contingency Schedule	3.3.1.2.3 5.1.3.2	Reduced scallop fishing in Closed Area I and an additional trip in Closed Area II will have few measurable effects on sea turtles during the access periods.	Although interactions between sea turtles and the scallop fishery have been documented on GB, turtles are present in low numbers and are not expected to be impacted by adjustments in fishery activities in the region. Neutral
Additional open DAS for YT TAC	3.3.1.2.4 5.1.3.2.1	Open area scallop fishing generally results in effort increases that could negatively impact turtles in the MA during turtle high use periods and in preferred habitats. Negative Impacts may be decrease given the number of open area DAS to be allocated is to be prorated.	Allocating additional open areas DAS if the YTF TAC is reached could increase effort and risks to sea turtles, particularly if the measure results in more fishing in the MA during the May-Nov. period when sea turtles are seasonally most abundant in areas south of LI. Negative low
HUDSON CANYON AREA			
Extend duration of program until 2008	3.3.1.3.1 5.1.3.3	Distributing fishing effort over a several year period vs. open area fishing under both no action and the status quo will result in potentially positive benefits for sea turtles.	Area rotation has the ability to restrict and/or spread effort out spatially and temporally is a long-term benefit of this scallop management program if it reduces the risk of sea turtle interactions. Positive low
ELEPHANT TRUNK AREA (ETA)			
Precautionary trip allocations – max. 5 trips	3.3.1.4.1.1 5.1.3.4.1	The effects of reopening the ETA vs. a closure are unknown but would likely produce negative impacts versus a closure. A 5 trip limit will likely mitigate that outcome particularly in view of the 9 trip status quo alternative and the additional potential for scallop trawl effort to increase.	The ETA is subject to area rotation management and would at some point become open to scallop fishing. Given the location of scallop fishing effort, inclusion in the management program is likely to produce benefits vs. open area fishing. Positive low
Re-open January 1, 2007	3.3.1.4.2.1 5.1.3.4.2		
Seasonal closures from Sept 1-Oct31	3.3.1.4.3.3 5.1.3.4.3	A closure to scallop fishing may have positive benefits to turtles in the ETA if fishing effort is not displaced to areas with higher densities of turtles than inside the ETA.	Because turtle distribution throughout the MA is dependent on a number of unpredictable factors such as availability of forage and water temperatures, area closures may or may not be effective in reducing interactions between turtles and the scallop fishery. Potential benefits therefore, are unknown at this time. Unknown
PROCEDURES TO ADJUST ETA			
Rulemaking	3.3.1.5.1 5.1.3.5	The rulemaking procedure would have little impact on sea turtles per se, but could negatively impact any turtles present in the ETA if trips	Any increases in fishing effort may negatively impact sea turtles if effort overlaps with the distribution of turtles in the MA,

PROPOSED ACTION	Sections that describe and analyze the alternative	Summary of Direct/indirect Impacts	Summary of Cumulative Effects on protected species
		were adjusted upward relative to a downward adjustment and the effort overlapped with during turtles high use season and in preferred habitats	particularly during the May-Nov. period when they are seasonally most abundant. Unknown
DELMARVA AREA			
Close when ETA opens in 2007	3.3.1.6.1 5.1.3.6	A DMV closure could benefit turtles within the area if effort is not concentrated in the available open areas where turtles distribution may be as dense or more so than inside the DMV.	Any increases in fishing effort may negatively impact sea turtles if effort overlaps with the distribution of turtles in the MA, particularly during the May-Nov. period when they are seasonally most abundant. Unknown
Open Area Management			
DMV Closure – 20K open	3.3.2 5.1.3.7	Open area DAS in 2006 and 2007 would increase under the proposed action relative to the past two years, but represent a decrease relative to the other alternatives under consideration in FW18.	Any increases in fishing effort may negatively impact sea turtles if effort overlaps with the distribution of turtles in the MA, particularly during the May-Nov. period when they are seasonally most abundant. Unknown
Limited Access Crew Limits			
Eliminate 7 crew limit for access trips	3.3.3.1 5.1.3.8	With a larger crew, trips could be potentially shorter in duration in the controlled access areas, possibly reducing negative impacts to turtles if tow times are measurably shorter	Reductions in scallop fishing, particularly in high use areas when turtles are most abundant would result in potentially positive benefits to turtles in the access areas (especially in the MA). Positive low
Trip Exchange Deadline			
Eliminate June 1 deadline	3.3.4.1 5.1.3.9	This is an administrative measure that is not likely to have any discernable effects on sea turtles.	None
Controlled Access Area Trip Exchanges			
1 to 1 exchange for GB 2006 and ET2007	3.3.5.1 5.1.3.9	These are administrative measures that are not likely to have any discernable impacts on sea turtles given that none are likely to result in effort increases.	None
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	3.3.5.3 5.1.3.9		
Status Quo - 1 to 1 exchange of access area trips for trips in other access areas that are open	3.3.5.4 5.1.3.9		
Broken Trip Exemption Program			
60 day carry over of compensations trips	3.3.6.1 5.1.3.9	This is an administrative measure that is not likely to have any discernable effects on sea turtles.	None

Table 131 – Summary of cumulative impacts of the proposed action on essential fish habitat

PROPOSED ALTERNATIVES	Section that describes alternative	Relevant Analysis Section and Summary of Direct Impacts	Summary of Cumulative Effects on Essential Fish Habitat
Area Rotation Measures and Allocation			
AREA SPECIFIC LIMITS			
Max # of trips and possession limit (SQ)	3.3.1.1.2 5.1.4.1	Section 5.1.? Allocating by maximum trip and possession limit may cause more trips overall, but trip length is shorter.	Overall, no change in pounds landed and is a tradeoff for more trips of shorter length as compared to the other alternative of less trips but of longer length. Neutral
GEORGES BANK ACCESS			
Contingency Schedule	3.3.1.2.3 5.1.4.2.1	Because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.	Shifting of DAS from CAI to CAII: The southern portion of Closed Area II is already impacted by scallop gear from the controlled access program but is generally considered less complex habitat than those found in Closed Area I. Neutral/Low positive
Additional open DAS for YT TAC	3.3.1.2.4 5.1.4.2.2	While this may cause an increase in fishing in open areas, because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.	Increased fishing in open areas is not the ideal situation, however, these impacts have been mitigated by measures in Amendment 10 and Amendment 13. Neutral/Low negative
HUDSON CANYON AREA			
Extend duration of program until 2008	3.3.1.3.1 5.1.4.3	While this may cause an increase in fishing in open areas, because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.	This measure does not allocate any additional DAS or effort in the area but rather allows permit holders to fish the same allocation over a longer period of time. As such, there will be no additional habitat impacts as a result of this measure. Neutral
ELEPHANT TRUNK AREA			
Precautionary trip allocations – max. 5 trips	3.3.1.4.1.1 5.1.4.4.1	Due to the precautionary trip allocations relative to what was expected under Amendment 10, the habitat impacts of this alternative are minimal.	This allocation is estimated to result in a fishing mortality of 0.16 which is decidedly lower than the status quo condition (0.32) and should be considered a precautionary measure as compared to what was expected under Amendment 10. Neutral/Low positive
Re-open January 1, 2007	3.3.1.4.2.1 5.1.4.4.2	Because the number of trips into ETA is fixed at 5, there are no recognizable impacts of this measure on EFH.	Further, the difference in opening two months early (January 1 or March 1) will result in negligible habitat impacts Neutral
Seasonal closures from Sept 1-Oct31	3.3.1.4.3.3 5.1.4.4.3	Because the number of trips into ETA is fixed at 5 for the entire year, there are no recognizable impacts of this measure on EFH.	This proposal creates a seasonal closure which may not have lasting positive habitat impacts as compared to a year-round closure. Neutral
PROCEDURES TO ADJUST ET AREA			
Rulemaking	3.3.1.5.1 5.1.4.5	The Council approved a rulemaking process that would allow the Regional Administrator to adjust allocations in the ETA based on updated biomass projections. Because this measure sets up a process that allows the RA flexibility, it is largely administrative and would not have any direct impacts on EFH.	No additional cumulative habitat impacts due to administrative nature of the measure. Neutral
DELMARVA AREA			
Close when ET opens in 2007	3.3.1.6.1 5.1.4.6	The Delmarva area would remain closed for three years until 2010 when the small scallops have grown sufficiently to be harvested.	This would result in additional area closed to <i>open area</i> scallop fishing in the mid-Atlantic and could be considered positive for

			EFH as it would be closed to scallop fishing (bottom tending mobile gear) for three years. Low Positive
Open Area Management			
DMV Closure – 20K open	3.3.2 5.1.4.7	Overall, it is estimated that the proposed action will increase long-term area swept approximately 7% as compared to the status quo. Because the proposed action is not beyond the impacts analyzed and mitigated for in Amendment 10, the impacts to EFH will be minimal.	It is impossible to determine where this new bottom contact will occur and in what types of habitats. It is important to note that the proposed measure does not propose any access or changes to the habitat closed areas. Low Negative
Limited Access Crew Limits			
Eliminate 7 crew limit for access trips	3.3.3.1 5.1.4.8	No net increase in bottom contact time. Fishing impacts on benthic environments are expected to be the same as status quo.	Additional impacts are not expected due to no net increase in bottom contact time. Neutral
Trip Exchange Deadline			
Eliminate June 1 deadline	3.3.4.1 5.1.4.9	This measure is largely administrative and will have no discernible habitat impacts.	No additional habitat impacts are expected from this administrative measure. Neutral
Controlled Access Area Trip Exchanges			
1 to 1 exchange for GB2006 and ET2007	3.3.5.1 5.1.4.10	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	No additional habitat impacts are expected from this administrative measure. Neutral
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	3.3.5.3 5.1.4.10	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	No additional habitat impacts are expected from this administrative measure. Neutral
Status Quo - 1 to 1 exchange of access area trips for trips in other access areas that are open	3.3.5.4 5.1.4.10	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	No additional habitat impacts are expected from this administrative measure. Neutral
Broken Trip Exemption Program			
60 day carry over of compensations trips	3.3.6.1 5.1.4.11	Likely to have minimum habitat/biological effects over the long term. However, the short-term effects on EFH are unclear and may need to be considered during framework adjustments that re-specify future TACs.	No long-term additional impacts expected but short-term negative impacts are possible but not discernible at this time. Neutral/Low negative

Table 132 - Summary of cumulative impacts of the proposed action on the human environment

PROPOSED ACTION	Section that describe and analyze the alternative	Summary of Direct/Indirect Impacts	Summary of Cumulative Effects on human environment
Area Rotation Measures and Allocation			
AREA SPECIFIC LIMITS			
Max # of trips and possession limit (SQ)	3.3.1.1.2 5.2.2.1 5.3.1	Section 5.2.2.1 Area specific trip allocations and possession limits help to prevent overfishing in access areas, preventing reduction in future yield, social and economic benefits from the scallop fishery. Although possession limits increase fishing costs by lowering flexibility for vessels about how many trips to take to land the allocated amounts, it also prevents derby style fishing, resulting in more stable landings, and less fluctuation in prices over time.	This action is not expected to change economic and social benefits because there will be no change in regulations. Area specific allocations combined by possessions limits has prevented overfishing in access areas, reduced incentives for derby style fishing and prevented potential negative social and economic impacts (i.e., lower LPUE, higher costs, lower prices) associated with it. These benefits are expected to outweigh the negative social and economic impacts due to reduced flexibility to vessels due to limits on trip landings. Positive low
GEORGES BANK ACCESS			
Contingency Schedule	3.3.1.2.3 5.2.1 5.2.2.2 5.3.2	Section 5.2.2.2 Larger landings and positive economic benefits in the short and the long-term due to the allocation of more trips to the access areas, and shifting CAI trips to CAII to prevent reduction of future landings and revenues from this area.	Area rotation and controlled access area management had positive economic and social impacts in the past. The revised access schedule will augment these positive impacts by allocating more access trips consistently over the years. Positive
Additional open DAS for YT TAC	3.3.1.2.4 5.2.2.3 5.3.2	Section 5.2.2.3 This will help to minimize the loss in pounds and revenue due to the closure of access areas before a vessel takes its trip, thus will have a positive impact on vessels and communities.	This measure will improve the performance of the rotational area management, and as a result, will increase social and economic benefits from the scallop resource by postponing landings from HCA to later years when scallop biomass is higher. Positive
HUDSON CANYON AREA			
Extend duration of program until 2008	3.3.1.3.1 5.2.1 5.2.2.4 5.3.3	Section 5.2.2.4 This measure is expected to have positive economic impacts because the vessels could lower their costs and increase their profits by taking trips when catch rates increase relative to the 2005 levels	This measure will improve cumulative economic and social benefits from rotational area management by providing vessels more flexibility about when to take their trips. Positive
ELEPHANT TRUNK AREA (ETA)			
Precautionary trip allocations – max. 5 trips	3.3.1.4.1.1 5.2.1 5.2.2.5.1 5.3.4	Section 5.2.2.5.1? Landings and revenues will decline in 2007 compared to status quo full access to this area. General category landings and revenue may decline due to 2% TAC for this area, but overall cumulative value of economic benefits will be larger both in the short- and the long-term. Limiting the number of trips to 5 trips per vessel could also have safety benefits.	This measure will reduce the unexpected declines in scallop landings and revenue by lowering the risk of over-fishing the area and the need for reducing allocated trips in the future. It will thus have beneficial cumulative impacts on human environment by helping to stabilize revenues from the scallop fishery. Negative low in the short-term due to restricted number of trips to this area, but Positive overall.
Re-open January 1, 2007	3.3.1.4.2.1 5.2.2.5.2 5.3.4	Section 5.2.2.5.2? Positive economic and social impacts by helping to spread out fishing effort and landings and revenues over time, and by providing vessels more flexibility about when to fish.	This measure will have positive cumulative impacts on human environment by keeping revenues stable and costs of fishing lower due to increased flexibility about when to fish. Positive low
Seasonal closures from Sept 1-Oct31	3.3.1.4.3.3 5.2.2.5.3	Section 5.2.2.5.3? Seasonal closures can have negative economic and social effects on	If seasonal closures are effective in reducing bycatch and sea turtle interactions, they will prevent more stringent measures on

PROPOSED ACTION	Section that describe and analyze the alternative	Summary of Direct/Indirect Impacts	Summary of Cumulative Effects on human environment
	5.3.4	scallop fishermen by reducing their flexibility in choosing when to fish and by increasing the costs of fishing. These measures will have positive economic benefits for other fisheries if they are effective in reducing finfish bycatch.	scallop fishermen with larger negative impacts in the future. Thus, short-term negative impacts on human environment can be outweighed by these long-term positive impacts and positive impacts on human environment in other fisheries. Negative in the short-term, Neutral overall.
PROCEDURES TO ADJUST ETA			
Rulemaking	3.3.1.5.1 5.2.2.6 5.3.4.1	Section 5.2.2.6? Positive economic and social impacts by ensuring that optimum yield is achievable even if there is insufficient time to develop a framework adjustment when new ETA biomass data becomes available.	Since these procedures will make adjustments to trip allocations in order to achieve optimal level of landings, and, therefore, revenues from the scallop resource, they will have beneficial cumulative impacts on the human environment. Positive low
DELMARVA AREA			
Close when ETA opens in 2007	3.3.1.6.1 5.2.2.7 5.3.5	Section 5.2.2.7? Overall impacts of this measure on revenues and economic benefits will be slightly positive due to larger landings with this measure over the long-term. Closing Delmarva could have some negative economic impacts, however, on some vessels which mainly fish in Mid-Atlantic areas. Some of these negative economic and social impacts may be mitigated by the re-opening of the Elephant Trunk area in the same year 2007.	This measure will maximize yield from Delmarva over the long-term, thus, it will have beneficial cumulative impacts on human environment by increasing long-term landings, economic and social benefits. Positive low, due to potential negative impacts on some vessels
Open Area Management			
DMV Closure – 20K open	3.3.2 5.2.1 5.2.3 5.3.6	Section 5.2.2.8? In combination with other proposed measures (DMV closures, HCA extension, ETA and Georges Bank access measures), this measure will result in higher scallop landings, revenues and economic benefits in the short-term compared to no action. The long-term impacts on human environment will be positive as well due to larger landings and economic benefits with this measure.	The cumulative impacts will be positive on human environment since this measure will prevent overfishing in open areas and will help to maximize yield and economic benefits from the scallop resource over the long-term. Positive
Limited Access Crew Limits			
Eliminate 7 crew limit for access trips	3.3.3.1 5.2.4 5.3.7	Section 5.2.2.9? Eliminating the crew limit for limited access vessels is expected to lower total fishing costs, increase total benefits for crew and the vessel-owners. Increasing crew limits could improve safety and provide more opportunities for new recruits and shackers. On the other hand, this measure can have negative impacts if leads to a significant reduction in income per crew member and if unlimited crew size leads to smaller scallops being landed.	This measure could have negative economic and social impacts if there is a race to fish by many vessels employing a large crew before catch rates per day decline or before the area is closed due to bycatch. In addition, if a larger crew size results in higher mortality on small scallops, then both the immediate impacts (if price falls) and long-term impacts (when harvesting smaller scallops affects future landings) would be negative. These negative impacts could cancel out the positive impacts of lower fishing costs due to larger crew size and positive safety impacts. Neutral
Trip Exchange Deadline			
Eliminate June 1 deadline	3.3.4.1 5.2.5.1 5.3.8	Section 5.2.2.10.1? This measure is expected to have positive economic and social impacts by providing greater flexibility for vessel owners and fishermen to respond to existing conditions and to lower fishing costs.	This action improves the flexibility and performance of the controlled access area management program, lowers the business risk and costs associated with area rotation program by eliminating the trip exchange deadline. Positive low
Controlled Access Area Trip Exchanges			

PROPOSED ACTION	Section that describe and analyze the alternative	Summary of Direct/Indirect Impacts	Summary of Cumulative Effects on human environment
1 to 1 exchange for GB2006 and ET2007	3.3.5.1 5.2.5.2 - 5.2.5.5 5.3.9	Section 5.2.2.10.2? Allowing vessels that are closer or prefer to fish in the Georges Bank access areas rather than in the Elephant Trunk Area (and vice versa) to exchange their trips with another vessel will have positive economic impacts by providing greater flexibility to vessels regarding which areas to fish, thereby reducing fishing costs without changing the total allocations in each area.	This action improves the flexibility and performance of the controlled access area management program, lowers the business risks and fishing costs associated with area rotation program. Positive low
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	3.3.5.3 5.2.5.2 - 5.2.5.5 5.3.9	Section 5.2.2.10.2? This measure is expected to have positive economic impacts by allowing the vessels to delay their unused trips until conditions improve and more catch per DAS could be landed than currently possible.	This action improves the flexibility and performance of the controlled access area management program, lowers the business risks and fishing costs associated with area rotation program. Positive low
Status Quo - 1 to 1 exchange of access area trips for trips in other access areas that are open	3.3.5.4 5.2.5.2 - 5.2.5.5 5.3.9	Section 5.2.2.10.3 This measure will ensure that fishing effort and scallop mortality in the open areas will not exceed the targeted amount or to reduce future yield, social and economic benefits from the scallop resource.	This measure will have positive impacts on human environment by helping the benefits of area rotation program and open area management to continue. Positive low
Broken Trip Exemption Program			
60 day carry over of compensations trips	3.3.6.1 5.2.5.6 5.3.10	Section 5.2.2.10.4? The 60-day carry forward alternative would have positive impacts on vessels by reducing any revenue loss if the compensation trips could not be taken at the end of the same fishing year due to weather or other factors.	This action improves the flexibility of the controlled access area management program, lowers the business risks and fishing costs associated with area rotation program. Positive low

6.0 APPLICABLE LAW

6.1 Magnuson-Stevens Fishery Conservation and Management Act

6.1.1 Compliance with National Standards

6.1.1.1 National Standard 1: Overfishing and Optimum Yield

“Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.”

The biological reference points and control rule for Atlantic sea scallops was revised and updated in Amendment 10 to the FMP. The 2005 survey data, used in this framework adjustment to update the biological information, indicates that the scallop biomass is above the MSY biomass target and will remain above this level for the foreseeable future under either the proposed action or the No Action alternative. Also the updated analysis indicates that fishing mortality will remain below the overfishing threshold mortality rate, F_{max} , either with the proposed action or the No Action alternative. The overall fishing mortality target associated with optimum yield for the preferred alternative is 0.172, which leaves a considerable amount of catch that could take place without causing overfishing to occur.

Furthermore, the proposed action improves the FMPs ability to produce optimum yield with rotation area management, boosting the biomass in open scallop fishing areas (excluding the present controlled access areas). According to the analyses, the proposed action will allow a higher yield per recruit from the open areas, increasing the amount of more valuable, large scallops that will be available to the fishery. At the same time, the analysis in Section 5.1 shows that access allows the fishery to achieve optimum yield while minimizing impacts to habitat and bycatch.

The analysis also shows that reducing biomass in the proposed access areas is unlikely to cause the total biomass decline for the Georges Bank and Mid-Atlantic regions. Considerable stock biomass and spawners will remain in the Georges Bank closed areas and in the proposed access areas, because the proposed action will have a time-averaged fishing mortality rate less than F_{MSY} .

6.1.1.2 National Standard 2: Best Available Science

“Conservation and management measures shall be based upon the best scientific information available.”

The information used in the framework adjustment analyses included the fishery data from the most recently completed fishing year (2004) and the most recent survey data (2005) collected by the NMFS on the R/V Albatross and by SMAST on industry-based surveys. Furthermore, the analyses were prepared by and peer reviewed by the Council’s Scallop Plan Development Team and complies with the Data Quality Act. Data on habitat and affected bottom substrates were also derived from preliminary 2003 SMAST video survey of the proposed access areas, focusing on Closed Area I which was more

controversial than the other proposed access areas. Thus, the information used for this framework adjustment is the best available data currently available for analysis.

6.1.1.3 National Standard 3: Management Unit

“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 Seas Scallop FMP, the target fishing mortality rate and stock biomass are applied to the scallop resource from NC to the US/CAN boundary. This encompasses the entire range of scallop stocks under Federal jurisdiction.

6.1.1.4 National Standard 4: Fairness and equity

“Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.”

The proposed action maintains equity by allowing fishermen, vessel owners, and fishing communities to benefit from the scallop biomass that has built up in the Georges Bank closed areas and projected to increase in the Mid-Atlantic controlled access areas. Vessels with general category scallop permits as well as vessels with limited access scallop permits will be able to fish in the proposed access areas. Some vessels with general category permits may have targeted scallops in these areas before they were closed and many more have been affected by the severe restrictions in other fisheries that are under rebuilding programs. Access therefore allows these vessels that may have been disadvantaged by the closures or are under severe restrictions in other fisheries to benefit from the surplus scallop biomass in the access areas.

There are no alternatives in the proposed action that discriminate against fishermen in various states. Although it will be more costly for vessels from Mid-Atlantic states to participate in the proposed access areas on Georges Bank in 2006, the opening of the Elephant Trunk Area (ETA) in 2007 and the ability to exchange controlled access trips will lessen this problem. Vessels that use scallop trawls (more prevalent in the Mid-Atlantic region) may fish in the proposed access areas with dredges, or exchange trips to fish where scallop trawls are permitted. This measure could increase costs to fishermen who have customarily used scallop trawls, but this conservation measure is needed to minimize finfish bycatch and achieve optimum yield by keeping the access areas open as long as possible.

6.1.1.5 National Standard 5: Efficiency

“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 adjusts the area rotation strategy, which has improves efficiency in the scallop fishery by protecting aggregations of small scallops from being harvested. As a result, this strategy will continue to increase the yield per recruit and scallop catch rates. The proposed action will prevent a derby

style fishery that could lead to inefficiency in the Elephant Trunk Area (ETA) and will increase total net economic benefits (Table 105, Section 5.2.1.3).

Rotational area management distributes fishing effort to areas where the catch rates are high, reducing fishing costs. The proposed action would do this without forcing vessels to fish at a frantic pace that might cause waste of fishery resources and capital. Under the proposal, vessels would be allocated and charged 12 DAS for controlled access trips, even though they will take fewer days to land their trip limit. This provision is expected to allow vessels to fish at slower pace to target the desired scallop beds more efficiently and avoid unwanted bycatch.

6.1.1.6 National Standard 6: Variations and Contingencies

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

The proposed action enhances the FMP’s ability 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 the open areas, and potentially allowing the FMP greater flexibility to achieve optimum yield through rotation area management in the future. Additionally one measure in the proposed action allows the NOAA Fisheries Regional Administrator to quickly adjust the level of fishing in the Elephant Trunk Area based on updated scallop abundance data, should the abundance of scallops not be as great as currently anticipated. Also, the proposed action allows vessels to return to port without penalty should their controlled access area fishing trips be interrupted by bad weather and to exchange trips among controlled access areas without a deadline.

6.1.1.7 National Standard 7: Cost and Duplication

“Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.”

The proposed action does not introduce any new measures that duplicate measures already in place. Area rotation and DAS controls were implemented in 1994 and the full area rotation program 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 actions, continues to be a major factor that minimizes harvesting costs.

6.1.1.8 National Standard 8: Communities

“Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.”

The characteristics and participation of fishing communities involved in the scallop fishery were discussed in Section 7.1.1.3 of the Amendment 10 FSEIS, and the impacts of rotation area management were also discussed in Section 8.8. The economic and social impacts, which affect fishing communities, are analyzed and discussed in Sections 0 Economic Impacts and 5.3 Social Impacts. 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.

6.1.1.9 National Standard 9: Bycatch

“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. The impacts of this action

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 cause groundfish mortality to 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 that is vulnerable to capture by scallop dredges), seasons for access (to avoid peak groundfish spawning months), enhanced sea sampling (to monitor and assess bycatch), and changes in the finfish possession limits (to minimize 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 to reduce finfish bycatch by reducing fishing time and allowing greater escapement of small finfish.

The direct and indirect impacts of these measures are analyzed and described in Section 5.1.2. Bycatch of skate is also analyzed and discussed in the skate baseline review (Section 6.1.3.1). The proposed action has no impact on some bycatch species and substantially benefits many species, especially those that are more abundant in open fishing areas where scallop fishing occurs. Bycatch of protected species is analyzed in Section 5.1.3.

As stated in the description of the Purpose and Need for the proposed action, the recent court rulings on Amendment 13 to the Multispecies FMP, Amendment 10 to the Scallop FMP, and on Frameworks 16/39 to the Scallop and Multispecies FMP have clarified requirements regarding standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in a fishery. In particular, the Court, in Oceana v. Evans, has remanded Amendment 10 to the Scallop FMP to NMFS to address SBRM in accordance with the Court’s ruling. The Council intends to address the remand regarding SBRM for the scallop fishery on a comprehensive manner in the next amendment to

the Scallop FMP. In the meantime, the current SBRM will remain in place, including the current level of observer coverage.

6.1.1.10 National Standard 10: Safety

“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. Although the crew limits induce fishermen to work long watches on a DAS, to date there is no evidence that this has caused casualties to increase.

6.1.2 Required Provisions of an FMP

Section 6.2 of Amendment 10 to the Atlantic Sea Scallop FMP describes and analyzes the FMP’s compliance with the required provisions of the Magnuson Act, §303(a). Nothing in this framework adjustment affects compliance with foreign fishing measures, a description of the fishery, a discussion of pertinent fishery data, allowances for temporary adjustments for safety, the fishery impact statement, objectives to prevent overfishing, effects on recreational catch and release, or the description of the fishery.

The framework adjustment improves the ability of the FMP to achieve maximum sustainable yield and optimum yield, by making more of the scallop resource available to the fishery without increasing the net adverse effects on the environment, with particular regard to bycatch and habitat. It also adjusts open area DAS to a level that will increase yield per recruit and not exceed with the target fishing mortality rate ($F=0.2$). The action therefore reduces fishing mortality in open fishing areas to levels that are more consistent with improving yield-per-recruit, and over the long term increases maximum sustainable yield because more of the scallop resource will become available for producing yield.

The framework adjustment proposes to allocate trips to scallop fishing vessels, with fishing opportunities in proportion to their DAS allocations for full-time, part-time, and occasional vessels. These proportional allocations were established by Amendment 4 in 1994, when vessels originally qualified for limited access status. These allocations have reflected the relative level of dependence of the sectors and deemed by the Council to be fair and equitable..

Using a discretionary provision, this framework adjustment uses catch and gear limits to regulate the fishery. A “hard” TAC (quota) will regulate sea scallop landings and yellowtail flounder catches from the access areas, preventing the catches from exceeding biological limits. Also, additional gear restrictions will apply to prevent excessive catches of regulated groundfish and other finfish in the access areas, as well as require more size selective scallop fishing gear to reduce mortality on smaller scallops that may be caught incidentally.

No changes to EFH designations or habitat closed area boundaries are being proposed as part of this framework adjustment.

A fishery management plan requires a standardized bycatch reporting methodology. The Council is initiating an Amendment to revise the current methodology to address the concerns raised in the decision of the court in Ocean v. Evans, 384 F.Supp.2d 203 (D.D.C, August 2, 2005). Until that action is

implemented, the current program will remain in effect and will be used to estimate bycatch, consistent with this required provision of the Magnuson-Stevens Act. The current program relies primarily on data from the NMFS Observer Program as more fully described in Amendment 10 and Frameworks 16/39. In summary, observers are placed on scallop vessels (all permit and gear categories) throughout the region and year. Amendment 10 and Frameworks 16/39 specify target observer coverage levels for the scallop fishery which serve as the basis for observer deployment. Information collected by observers is compiled and extrapolated where appropriate to estimate the total bycatch in the scallop fishery.

6.1.3 Required Provisions of Other FMPs

6.1.3.1 Skate Baseline Review

The Skate FMP identified and characterized a baseline of management measures in other fisheries that provide additional conservation benefits to skate species. The FMP requires that if the Council initiates an action in another FMP that changes one or more of the baseline measures such that the change is likely to have an effect on the overall mortality for a species of skate in a formal rebuilding program, then a baseline review is required.

A baseline review must be initiated if one of seven categories of management measures are changed which have been identified as beneficial for skates. The seven categories of management measures identified in the Skate FMP are: (i) NE Multispecies year-round closed areas; (ii) NE Multispecies DAS restrictions; (iii) Gillnet gear restrictions; (iv) Lobster restricted gear areas; (v) Gear restrictions for small mesh fisheries; (vi) Monkfish DAS restrictions for monkfish only permit holders; and (vii) Scallop DAS restrictions (See Section 4.1.6 of the Skate FMP for more details).

The purpose of Framework Adjustment 18 is to set specifications and allocations for the 2006 and 2007 fishing years, while making other management adjustments as necessary to achieve optimum yield. Framework 18 considered a host of measures, but only two trigger a skate baseline review. One measure includes the rotational access program on Georges Bank for fishing years 2006-2007. Since this program would allow limited access into portions of NE multispecies closed areas, a skate baseline review would normally be required. However, since this access program has already been approved under a previous scallop action (Framework 16/39), the skate baseline review has already been conducted; therefore this review will only evaluate whether the new modifications under consideration are expected to have specific impacts on skate mortality (i.e., these proposed changes will impact skates according to their known distributions beyond those impacts already analyzed in FW 16/39). The baseline analysis for this action will also include some bycatch data from the last area access program in 2004 to ascertain any anticipated impacts to skates.

In addition, this framework is considering a range of DAS allocation alternatives. Open area DAS allocations are estimated after the access area TACs are established in order to achieve the annual target mortality rate for the entire resource. If access area DAS increase, then open area DAS decrease, and vice versa. This framework considered a range of total open area DAS from 15,000 to 30,000 depending on which access areas are available. The proposed alternative proposes 20,000 open area DAS for a total of about 39,000 DAS for FY2006. Under this alternative, about 19,000 DAS would be allocated for exclusive use in the access areas. DAS allocations would increase in FY2007 to about 46,000 DAS. The framework projects that about 29,500 DAS will be used in 2006 and about 34,000 DAS in 2007. DAS used is significantly lower than DAS allocated primarily because of the DAS tradeoff provision. Each vessel is charged 12 DAS on an access trip, while the average time it takes to harvest the trip limit is only six days. However, since the proposed total allocated DAS for both FY2006 and

FY2007 is above the baseline amount assessed in the Skate FMP of 34,000 DAS, the Skate PDT is required to assess the potential impacts of that increase in allocated scallop effort on skate mortality, regardless of the fact that many of the allocated DAS are never really “used”. There are other measures being implemented in this framework, but the impact of these measures on skate mortality is either non-existent or uncertain, and none of these measures fall within the list of seven categories of management measures that trigger a skate baseline review.

It is important to point out that the skate baseline review is only required for skate species that are currently in a formal rebuilding program. Of the seven skate species managed under the Northeast Skate Complex FMP, only two species are in a formal rebuilding program: thorny and barndoor. Therefore, this baseline review will only evaluate the impacts of this framework action on the mortality rates of these two species. Furthermore, the Skate FMP identifies only seven categories of management measures that would trigger a baseline review. Therefore, while there may be other measures in this framework action that could indirectly increase or decrease skate mortality, the baseline review is only required to evaluate the seven identified categories of measures. Therefore, this baseline review will assess only two of the seven categories of management measures: a change in the groundfish mortality closed areas and a change in the Scallop DAS restrictions.

6.1.3.2 Updated Stock Status for Thorny and Barndoor Skates

The overfishing definitions in the Skate FMP are based on a three-year moving average survey index. Since the FMP was submitted there have been additional biomass surveys that may show new trends in skate population rebuilding. In February 2005, the Council completed an annual update of stock status for all seven skate species. Table 133 shows the autumn survey indices from 1992-2004 for the two species of skate that are in a formal rebuilding program. Updated values for 2003 and 2004 have been added to the bottom of the table, as well as a new three-year average (2002-2004) for both species. The 1999-2001 three-year average is the index that was used in the FMP (Table 3 – Volume I of Skate FMP) and this value is what was compared to the biomass threshold in order to determine whether stocks were overfished at the time of implementation (2003). At that time, barndoor and thorny skates were considered overfished because their most recent three-year moving average was lower than the biomass threshold (0.81 for barndoor and 2.20 for thorny). The 2002-2004 three-year average weight per tow is now the most updated biomass index for each species. In order to determine which species are now considered overfished, this row is compared with the biomass threshold. Since the updated biomass index for barndoor is 0.88 (for 2002-2004), this species is no longer considered overfished. Thorny skate is the only skate species that is still overfished at a trawl survey index of 0.63. However, this skate baseline review will consider the impacts of modifying regulations in the Multispecies FMP on both barndoor and thorny skates since both species are still formally in a rebuilding program, even though barndoor is no longer considered overfished. It should be noted that according to the recent skate annual report (2005) the other five skate species are not overfished and overfishing is not occurring.

Table 133 - Summary of NEFSC biomass indices for barndoor and thorny skate from 1992 through 2004 (including 3-year moving averages for several time periods, as well as updated stock status according to the most recent Skate Annual Review, February 2005).

	BARNDOOR	THORNY
Survey (kg/tow)	Autumn	Autumn
1992	0.002	0.96
1993	0.14	1.66
1994	0.04	1.51
1995	0.11	0.78
1996	0.04	0.81
1997	0.11	0.85
1998	0.09	0.65
1999	0.30	0.48
2000	0.29	0.83
2001	0.54	0.33
2002	0.78	0.44
2003	0.55	0.74
2004	1.30	0.71
1999-2001 3-year average	0.38	0.55
2001-2003 3-year average	0.62	0.50
2002-2004 3-year average	0.88	0.63
Percent change 2002-2004 compared to 2001-2003	+40.7	+25.0
Percent change for overfishing status determination in FMP	-30	-20
Biomass Threshold	0.81	2.20
CURRENT STATUS	<u>Not</u> Overfished Overfishing is <u>Not</u> Occurring	<u>Overfished</u> Overfishing is <u>Not</u> Occurring

Map 15 and Map 16 depict the spatial distribution of each skate species based on data from the NMFS Autumn trawl survey from 1963 through 2003. To get a better idea of how skates are distributed in both the region and within the multispecies closed areas a spatial analysis was conducted using the NMFS survey data. Table 134 represents the total number of skates caught in the entire region for the entire 41-year time series (1963-2003). The survey area includes Federal waters from Maine to North Carolina, as well as some inshore locations and stations in Canadian waters. For the entire time series, about 19.8% of the survey tows caught one or more thorny skates, but the majority of stations in the Gulf of Maine had positive tows for thorny skate. It is important to point out that since neither barndoor nor

thorny skates live in the Mid-Atlantic region, including those stations in the total autumn survey database reduces the overall percent of tows that caught skates.

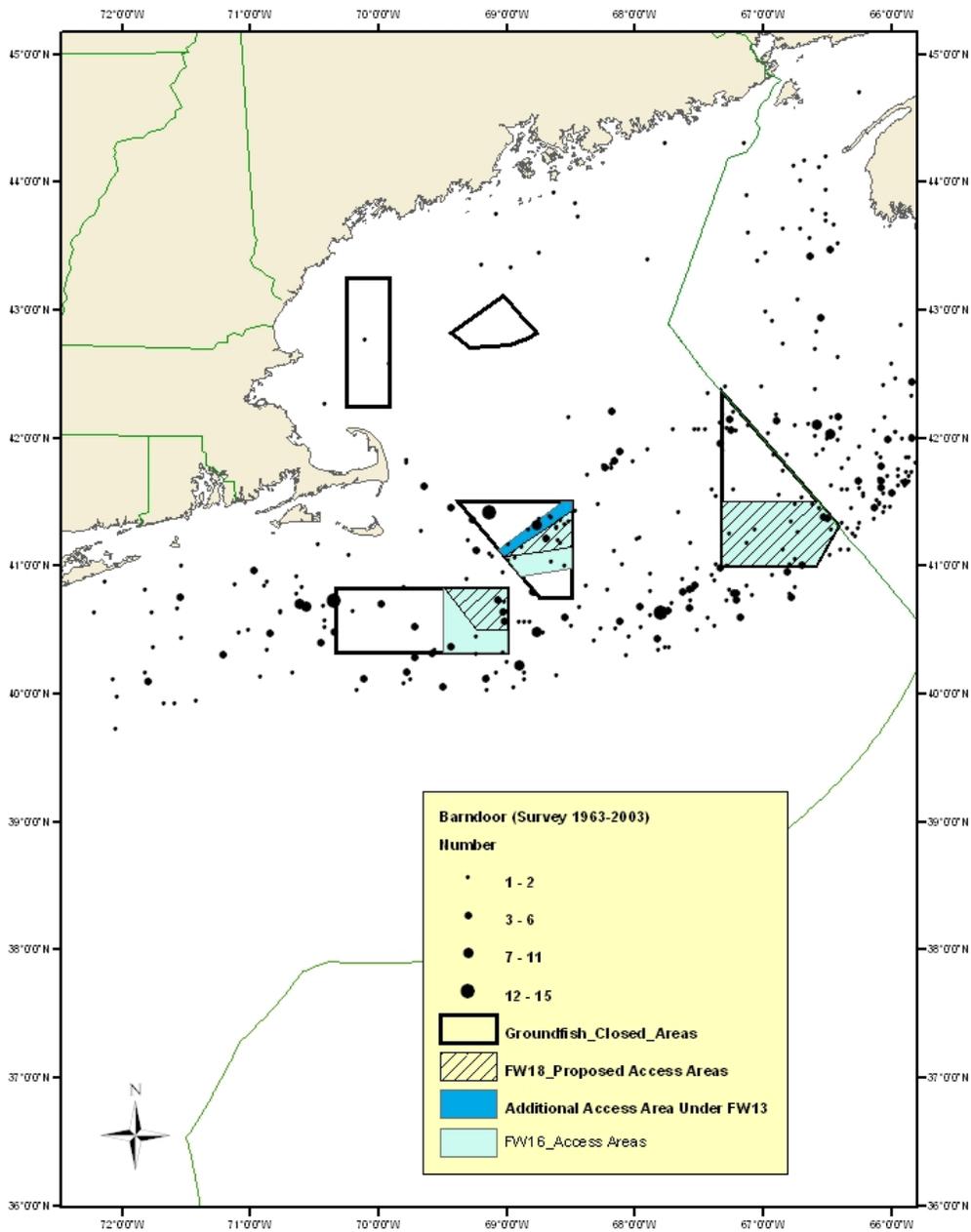
Table 134 – Number of barndoor and thorny skates from the NMFS Autumn trawl survey (1963 through 2003).

		Autumn Survey (1963-2003) <i>14,188 records</i>
BARNDOOR	Total Number of barndoor caught	727
	Total weight of barndoor caught (kg)	2,147
	# of tows in the entire survey area that caught barndoor	371 (2.6%)
	Average number of barndoor skates caught per year	17.7
THORNY	Number of thorny skates	10,586
	Total weight of thorny caught	22,758
	Number of tows in the entire survey area that caught thorny	2,816 (19.8%)
	Average number of thorny skates caught per year	258.2

Table 135 depicts the number of skates caught on the autumn survey within the groundfish mortality closed areas. This table documents the “baseline” skate mortality protection afforded by the groundfish mortality closed areas, as described in the Skate FMP. It is important to note that these values are only an estimate of abundance inside versus outside of the groundfish mortality closed areas because station density inside and outside the closed areas is not consistent from year to year. Therefore, it is difficult to compare the number of skates caught inside versus outside the groundfish mortality closed areas. The NMFS survey is stratified based on predefined strata, not a specific number of stations inside and outside the closed areas. With that in mind, 123 individual barndoors of the 727 barndoor skates recorded in the full time series were from within the boundaries of the groundfish closed areas (17%). In terms of thorny skates, thirteen percent of all the thorny skates recorded from the NMFS Autumn survey from 1963-2003 were found within the boundaries of the groundfish mortality closed areas as compared to the entire area (1,391 / 10,586).

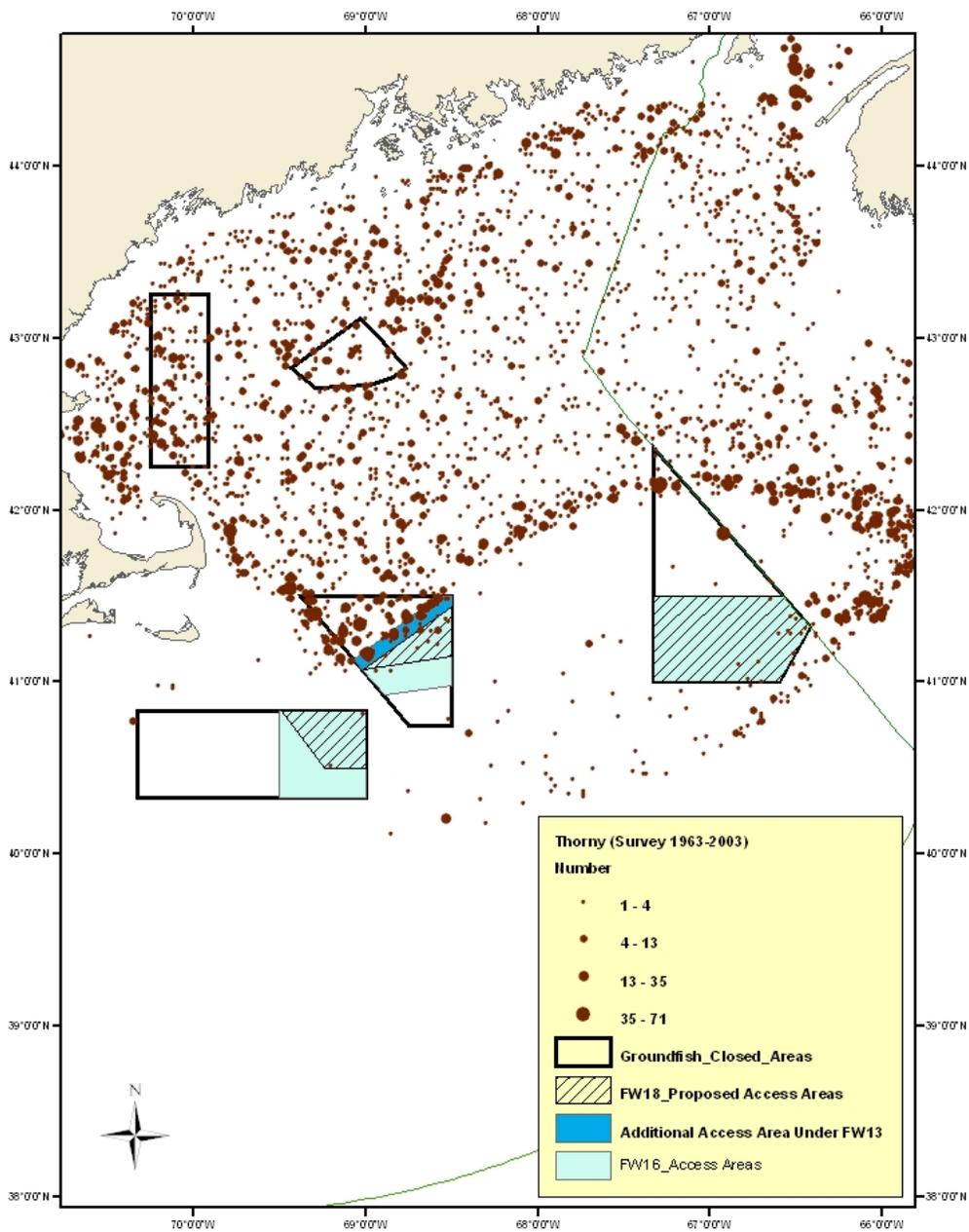
Table 135 – Number of barndoor and thorny skates from the Autumn Survey caught within the boundaries of the Groundfish closed areas (1963 through 2003).

		Autumn Survey (1963-2003) <i>14,188 records</i>
BARNDOOR	Total Number of barndoor caught	123
	Total weight of barndoor caught	327
	# of tows in the GF mortality closed areas that caught brn	60
	Average number of barndoor skates caught per year	3.0
THORNY	Number of thorny skates	1,391
	Total weight of thorny caught	2,720
	# of tows in the GF mortality closed areas that caught thorny	266
	Average number of thorny skates caught per year	33.9



Map 15 – Distribution of Barndoor skate from NMFS Autumn trawl survey data (1963 – 2003).

Note the proposed access area for FW18 (hatched) is smaller in Closed Area I than the access area under both FW13 and FW16. Under FW13 it included both the hatched area and the area to the north. The proposed access area for Closed Area II is the same as under FW 13 and FW16. The proposed access area for Nantucket Lightship would be the same as in FW13, but smaller than the access area under FW16.



Map 16 - Distribution of Thorny skate from NMFS Autumn trawl survey data (1963 –2003).

Note the proposed access area for FW18 (hatched) is smaller in Closed Area I than the access area under both FW13 and FW16. Under FW13 it included both the hatched area and the area to the north. The proposed access area for Closed Area II is the same as under FW 13 and FW16. The proposed access area for Nantucket Lightship would be the same as in FW13, but smaller than the access area under FW16.

6.1.3.3 Summary of potential impacts on skate mortality from the measures under consideration that modify the NE Multispecies year-round closed areas

This framework considered alternatives to allow scallop vessels limited access into portions of the groundfish mortality closed areas. Since the groundfish mortality closed areas were considered part of the baseline for skate mortality in the Skate FMP, it is possible that allowing access into portions of the closed areas may increase skate mortality as compared to the baseline. Framework 16/39 implemented an access program into portions of the multispecies closed areas for fishing years 2004 and 2005. A skate baseline review was conducted for that action and it was determined that there would not be overall impacts on barndoor or thorny skate mortality as a result of the access program. Technically this measure under Framework 18 does not formally trigger a full skate baseline review because the overall impacts of the access program on skates have already been assessed; therefore this section will only evaluate whether the new modifications under consideration are expected to have specific impacts on skate mortality. This framework is considering access to similar areas on Georges Bank as Framework 16/39 for fishing years 2006 and 2007; the only differences are the number of trips allocated and the access order. In addition, due to recent litigation related to habitat closed areas, the access areas in Closed Area I and Nantucket Lightship are smaller. Previously, Framework 16/39 allowed access in two of the three areas each year, but this framework is considering access in all three areas at once. Furthermore, the proposed action would allocate five access trips overall in FY2006, versus two access trips that were allocated in FY2005 and three access trips in FY2004. For FY2006, the proposed action is considering two trips for Nantucket Lightship, and three trips for Closed Area II. This increase of effort allocated in access areas is necessary to achieve optimum yield in the scallop fishery. The framework projects that about 10,600 DAS will be used in the access program in 2006, compared to about 19,000 allocated DAS. This projection assumes that 100% of the allocated access trips will be taken. For comparison, in FY2004 only about 48% of the allocated access trips were taken. Under FW16/39, about 3,229 DAS were used out of the 11,253 DAS allocated in the Georges Bank access areas (not including DAS allocated for use in Hudson Canyon). Under FW16/39, the number of days allocated was much greater than the number of days actually used fishing in the previous access program, due to the fact that only about half of the allocated trips were taken, but also because of the DAS tradeoff provision. The average trip length in the Georges Bank access areas was between 6 and 7 DAS, rather than the 12 DAS they were charged. This framework action projects that more trips will be taken than the previous access program, but the DAS tradeoff provision remains. Therefore, since bottom time will decrease as a result of high scallop abundance in the access areas, the impacts on skate mortality are expected to decrease as well. Fishing year 2005 is not complete yet, so these data are unavailable at this time.

While access area trips are expected to increase as a result of this action, the impact on overall skate mortality is not expected to be substantial. The access areas are on the periphery of thorny skate distribution, therefore fishing on Georges Bank would be unlikely to have a significant impact on thorny skate mortality. In fact, if scallop fishing effort from parts of the Gulf of Maine and the Great South Channel shifts into the access areas, then fishing-related thorny skate mortality would be expected to decrease as a result of this action as fishing effort would decrease in areas where thorny skates are more abundant. Furthermore, if effort is concentrated in areas with high scallop abundance, bottom contact time of the gear reduces, potentially decreasing the impacts on skate mortality.

On the other hand, barndoor skates are distributed on Georges Bank, but according to the analysis completed in FW16/39, only about 7% of the total barndoor skates caught in the NMFS survey from 1997 to 2003 were from within the access areas. Framework 16/39 assessed the observed barndoor bycatch levels from the 2000 scallop access program implemented by Framework 13 (See Section 7.1.4.2 of Framework 16/39 for more details). Overall, the amount of observed barndoor skate bycatch in the access

area within Closed Area I was relatively small. Keep in mind that the proposed access area in Closed Area I under this action is smaller than the access area implemented under Framework 16/39. However, the amount of observed barndoor skate bycatch in Closed Area II and Nantucket Lightship was considerably higher, in terms of the amount of barndoor skate caught per pound of scallop meat landed.

The bycatch analysis in this framework assessed the barndoor skate catch per hour on observed hauls on scallop vessels in 2004. These values were post-stratified by scallop stock area and by management status (open versus access area). See Section 5.1.2.2.3.1 for details. The analysis did not include a breakout of thorny skate bycatch because thorny skate distribution is primarily in the Gulf of Maine and northern edge of Georges Bank, and not within the access areas. For calendar year 2004, the barndoor bycatch rates were 0.17 lbs. /hr in the access areas, and 0.13 lbs. /hr in the open areas. The total estimated barndoor catch from the proposed access program is 10.2 mt for the access areas and 12.8 mt for the open areas. For comparison, the yellowtail flounder catch rates were 1.7 lbs. /hr in the access areas and 0.23 lbs. /hr in the open areas and total estimated yellowtail catch is 105 mt in access areas and 19.4 for open areas, significantly higher than the estimated catch rates of barndoor skate. Therefore, while this access program will allocate more DAS inside the access areas, as compared to open areas, the barndoor skate bycatch estimates are actually lower inside the access areas as compared to open areas; so arguably, barndoor bycatch may be lower on trips inside the access areas than in open areas, based on estimates from 2004 observer data.

While there has been and is projected to be barndoor skate bycatch in the access areas, barndoor skate biomass has continued to increase both during and after the previous scallop access programs. Therefore, access programs on Georges Bank have not and are not expected to curtail the recovery of barndoor skate, or have negative impacts on barndoor skate mortality. The actual discard mortality rate of barndoor skates caught as bycatch in the scallop fishery is unknown. Qualitative information described in Framework 16/39 suggests that barndoor skates are relatively robust when observed on deck, and discard mortality in the scallop fishery may be relatively low. However, more research is needed to assess the actual mortality rates of skate bycatch after release. Furthermore, similar to the last access program, the proposed access program will have a limit on the total number of trips each vessel can use in each area, and there is a yellowtail flounder bycatch TAC that will close the area. These limits on effort in the access areas may restrict catches of barndoor within the access areas.

It should be noted that the Closed Area II access area will be closed in 2007 under the proposed action in this document. Therefore, any potential impacts on skates in that area, particularly barndoor skates which are distributed there, would be temporary (FY2006 only). In addition, the proposed action is considering allocating five access trips in 2007 to the Elephant Trunk Area. This area is located south of the Hudson Canyon closure and has been closed to scallop fishing since June 2004. Neither barndoor nor thorny skate are distributed in this area, thus there are no impacts from this action. Furthermore, since a significant amount of total effort will be concentrated in the Mid-Atlantic in 2007 due to the five access trips in ETA, both thorny and barndoor skate bycatch may reduce overall since those skate species are distributed in the Gulf of Maine and Georges Bank only.

6.1.3.4 Summary of potential impacts on skate mortality from the measures under consideration that modify the Scallop DAS restrictions

The regulations for the Skate FMP state that a baseline review must occur if Scallop DAS measures are made less restrictive, according to section 648.53 of the regulations. The baseline Scallop DAS assessed in the Skate FMP were 120 DAS for full-time vessels, 48 DAS for part-time vessels, and 10 DAS for occasional vessels. If the total fleet DAS allocation is above 34,000 DAS then a skate baseline review is required. This framework considered a range of DAS alternatives from about 34,000 to 49,000 total DAS in 2006. The proposed action would allocate about 39,000 DAS (5,000 more than

assessed under the skate baseline). The total DAS allocations are broken down into access area allocations and open area allocations. After controlled access area allocations are determined, the open area DAS are set at a level that would achieve optimum yield. This framework considered a range of open area DAS from 15,000 to 30,000 depending on which access areas are available. The proposed action proposes 20,000 open area DAS, in addition to about 19,000 DAS allocated for exclusive use in the access areas for a total of about 39,000 DAS. Total DAS allocations would increase in FY2007 to about 46,000 DAS. This increase is primarily from access trips being allocated for exclusive use in the ETA. The proposed action allocated the same number of open area DAS in 2007, 20,000 DAS. The framework projects that about 29,500 DAS will be used in 2006 and about 34,000 DAS in 2007 (See Section 3.3.2.1 for details).

Since implementation of the Skate FMP, scallop management has changed significantly, and allocated DAS do not mean the same thing as they did prior to Amendment 10. Amendment 10 implements rotational area management and allocates specific numbers of DAS to vessels that can only be used inside rotational access areas, and a separate number of DAS to use outside identified access areas. Prior to Amendment 10, allocated DAS could be used in any area, and fishermen were not obligated to use days in certain areas. For example, the Skate FMP assessed the baseline of effort for full-time limited access vessels to be 120 DAS per year per vessel. At that time, those days could be fished anywhere that was open to scallop fishing. Under previous scallop actions, there were specific costs associated with entering an access area. When a vessel entered an access area, there was a scallop trip limit and vessels were charged an automatic minimum number of DAS, whether or not they fished all those days. For example, in fishing year 2000, full-time limited access vessels were charged a minimum of 10 DAS for each trip to an access area within the groundfish mortality closed areas, with a trip limit of 10,000 pounds of scallop meats. Since there was no trip limit restriction or DAS tradeoff charge for trips in outside areas, many vessels opted to use their DAS in outside areas instead of participating in the access program. However, under the rotational area management strategy implemented under Amendment 10 and this framework action, a certain number of DAS are available to vessels only if they participate in an access program and vessels are charged a minimum number of DAS for each trip to access these areas. Therefore, more DAS are allocated to account for the DAS tradeoff and possession limit restrictions.

For fishing year 2004, full-time limited access vessels received 42 DAS to fish anywhere they like in open areas, 48 DAS to be used exclusively if they fish in the Hudson Canyon Area, and 36 DAS to be used exclusively if they fish in the proposed access areas within the groundfish mortality closed areas. These three DAS allocations for full-time vessels totals 126 DAS, six more days than the 120 DAS assessed in the skate mortality baseline. However, if they choose not to participate in one or more of the access areas, then they forfeit that entire amount of DAS, which would not be available to use in other areas, as would have been the case under previous scallop actions. In fishing year 2005, the total DAS allocation for full time vessels was reduced to 100 DAS, 20 DAS less than the level used in the skate baseline assessment. Table 136 describes the proposed DAS allocations under the proposed action for all three limited access vessel categories for FY2006 and FY2007, as compared to previous years. The individual DAS allocations for 2006 are lower than the baseline for all three vessel categories. DAS allocations increase above the baseline in FY2007; however the majority of effort allocated that year will be for exclusive use in the Elephant Trunk access area (five trips or the equivalent of 60 DAS for each full-time vessel). The remaining 24 access area only DAS would be allocated for use within Closed Area I and Nantucket Lightship (12 DAS in each area). In FY2006 under the proposed action, full-time vessels would be awarded 52 open area DAS, 36 DAS for Closed Area II, and 24 DAS for the Nantucket Lightship access area. In FY2007 the proposed action would allocate 51 open area DAS for full time vessels, 12 DAS for Closed Area I, zero DAS in Closed Area II, 12 DAS in Nantucket Lightship and 60 DAS in the Elephant Trunk Area. For comparison, in 2004 full-time vessels were awarded 42 DAS for open areas and 84 DAS for access programs; therefore, the proposed alternative in this action will

actually award less DAS in the access areas than the previous framework for FY2006, and the same DAS for FY2007.

Table 136 – Allocated DAS for all three limited access scallop vessel categories, as well as DAS allocations for fishing years 2006-2007 under the proposed action.

Shaded row indicates the year that the Skate FMP used to define the baseline for Scallop DAS.

Year	Full-time	Part-time	Occasional
1999	142	57	12
2000	120	48	10
2001	120	48	10
2002	120	48	10
2003	120	48	10
2004	126	50	10
2005	100	40	8
2006 (under proposed action)	112	45	9
	(60 access DAS and 52 open area DAS)	(24 access DAS and 21 open area DAS)	(5 access DAS and 4 open area DAS)
2007 (under proposed action)	135	54	11
	(84 access DAS and 51 open area DAS)	(34 access DAS and 20 open area DAS)	(7 access DAS and 4 open area DAS)

The Skate FMP requires a baseline review if more than 34,000 limited access DAS are allocated to the entire limited access scallop fleet. Allocated DAS in the scallop fishery have varied over time, but have increased each year since FY2000. Table 137 describes the total allocated DAS for the limited access fleet, as well as the total number of DAS used by the fleet. From 2000 through 2003, the fleet has used around 85% of allocated DAS. However, based on changes in how the allocated DAS may be used by the fleet, it is projected that the fleet will not use all of their allocated DAS. Allocated DAS is expected to decline in FY2006 and FY2007 to about 75% of the allocated DAS. The reduction in DAS used from 2004 on is primarily due to the DAS tradeoff restriction. Because vessels are now charged more days to fish in access areas, the number of used DAS has declined. This tradeoff provision is still in effect and is the primary reason why DAS used is expected to be less than DAS allocated in 2006 and 2007.

Table 137 –Scallop DAS allocated and DAS used for fishing years 1999 through 2005, and DAS allocated and projected for use under the proposed action for 2006 and 2007.

**Projected values. **FY2005 not complete yet, so these are values that were projected under FW16/39. Shaded row indicates the year that the Skate FMP used to define the baseline for Scallop DAS.*

Year	DAS allocated	DAS used	Percent of DAS Allocated
1999	33,910	23,074	68%
2000	30,752	24,958	81%
2001	32,264	28,198	87%
2002	34,078	30,065	88%
2003	35,044	30,082	86%
2004	39,386	29,303	74%
2005	31,258**	28,437**	91%**
2006	39,017	29,591*	76%
2007	46,323	34,075*	74%

6.1.3.5 Conclusions

Overall, neither of the measures that triggered this skate baseline review is expected to have negative impacts on the overall mortality of skates. The access program has already been implemented in an earlier action; this framework only modifies the number of trips in each area as well as the order of access. Neither of these two modifications is expected to have negative impacts on overall skate mortality. In fact, the proposed access program will have very little, if any, impact on thorny skate mortality because the primary objective of the access program is to concentrate scallop effort in the access areas on Georges Bank, which are on the periphery of thorny skate distribution. In terms of barndoor skate, the primary justification for inferring that the proposed scallop access program would not substantially increase barndoor skate mortality is that the recovery trend of the species has continued even accelerated, during and after the last access programs in 1999, 2000, and 2004. Barndoor biomass has increased steadily since 1998 despite recent access programs. Another reason that barndoor skate mortality is not expected to increase as a result of this action is the qualitative information about the viability of barndoor skates when they are released into the water; it has been inferred by some that barndoor skate bycatch mortality may be low (D.Hart, personal communication). Lastly, according to the bycatch analysis in this document, barndoor skate catch levels are slightly less inside the access areas compared to open areas (0.13 lbs. /hr versus 0.17 lbs. /hr), so providing limited access into the closed areas is not expected to increase barndoor skate mortality. As for 2007 when more DAS will be allocated, impacts on skate mortality are expected to be minimal because scallop effort is projected to be concentrated in areas that do not overlap with barndoor and thorny distribution (within the Elephant Trunk Access Area).

Furthermore, the overall increase in scallop DAS for FY2006 and FY2007 is not expected to impact overall skate mortality. Allocated DAS have a different meaning than they did as assessed under the Skate FMP. Prior to this action, a vessel could use it's DAS anywhere it chose; however, now a vessel is restricted to use a certain number of days in each access area and there is a possession limit which equates to less time at sea actually fishing (i.e., dredging occurs for only 1 hour as opposed to the shucking and processing of scallops which can take up to 3 or 4 hours). This concentration of effort in access areas where scallops are concentrated is expected to reduce overall effort in open areas. Furthermore, if effort is concentrated in the Elephant Trunk area as a result of this action, that has the potential to shift effort to that area, which is south of the normal distribution of both thorny and barndoor skates.

There are other measures proposed in this action as well as implemented in recent actions under the Scallop FMP that may mitigate potential mortality of skates. For example, Framework 16/39 implemented the requirement for vessels to use 10-inch twine top mesh rather than 6-inch mesh. This measure would still be in effect under this framework and this gear modification is expected to increase escapement of fish such as skate, therefore reducing bycatch of skates. Furthermore, if effort is shifted from Georges Bank access areas to access areas in the Mid-Atlantic, the bycatch of rates of thorny and barndoor skates are expected to be minimal. Lastly, the yellowtail flounder catch cap for the Georges Bank access areas provides a backstop; if it is reached an access will close, limiting the amount of skate bycatch from these areas. All these measures help reduce the overall mortality of this fishery on skates that occur in the Georges Bank access areas, despite increases in total allocated DAS and limited access into portions of the multispecies year-round closed areas.

Recommendations

The Skate PDT does not expect overall negative impacts on skate mortality as a result of the measures under consideration in this action. Overall, the impacts of this action on skate mortality are expected to be minimal.

The Skate PDT does recommend additional data collection and research that would improve the assessment of skate mortality from bycatch and the impacts of fishing.

- The Skate PDT recommends that a discard mortality study (for example, a skate tagging program) should be initiated as soon as possible to determine the actual discard mortality rates of barndoor and other skate species released as bycatch. Until this information becomes available, it will remain very difficult to predict skate mortality rates from bycatch and the actual impacts this type of access program is likely to have on skate rebuilding.
- Recognizing that the design, development, and implementation of a discard mortality study is a long-term project, the Skate PDT also recommends that observers collect additional information regarding skate bycatch in both proposed access programs. The Skate PDT requests that NMFS provide special instructions to the observers on these access programs. Specifically, the Skate PDT is requesting that observers be trained to identify all skate species accurately, and, in addition to the number of skates caught, the number and viability (or condition) of skates released as bycatch should be documented.

The Skate PDT also recommends that because scallop management has changed substantially under rotational area management, it may be necessary to re-assess the skate baseline for Scallop DAS restrictions.

6.1.4 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

6.1.4.1 Description of Action

Briefly, the Council proposes to address the following topics in Framework 18 to the Atlantic Sea Scallop FMP:

- Area specific limits on fishing by limited access vessels (Section 3.3.1.1)
- Georges Bank area access management (Section 3.3.1.2)

- Hudson Canyon area rotation management (Section 3.3.1.3)
- Elephant Trunk area (ETA) rotation management (Section 3.3.1.4)
- Procedures to adjust ETA allocations (Section 3.3.1.5)
- Delmarva area rotation closure (Section 3.3.1.6)
- Open area management (Section 3.3.2)
- Limited access crew limits (Section 3.3.3)
- Trip exchange deadline (Section 3.3.4)
- Controlled access area trip exchanges (Section 3.3.5)
- Broken trip exemption program (Section 3.3.6)

The Council proposes the following management measures, selected from the alternatives in Section 3.3, as the final preferred action in this framework adjustment. The alternatives are briefly described below along with rationale why the Council selected them as preferred alternatives.

6.1.4.2 Assessing the Potential Adverse Impacts

None of the alternatives propose any access or changes to the Habitat Closed Areas established under Amendment 10 to the Atlantic Sea Scallop FMP or Amendment 13 to the Northeast Multispecies FMP.

Area specific limits on fishing by limited access vessels

The Council considered area specific allocation of total pounds per vessel with no trip possession limit for controlled access areas, but determined that action may be premature. Instead, the status quo alternative for area specific limits will remain in place. The proposed action would continue the current regulations that authorize limited access vessels to take a limited number of trips in each controlled access area with a scallop possession limit for each trip. Each access area trip made by a full-time vessel may land up to 18,000 pounds of scallop meats. Part-time vessel may land 40% of the full-time amount and occasional vessels may land 1/12th of the full-time amount.

Georges Bank Area Access Measures

- *Revise the Georges Bank area access schedule*

Parts of the multispecies closed areas on Georges Bank have been periodically opened for controlled scallop fishing since 1999. This action considered modifications to the access schedule, with no changes in boundaries. Based on PDT recommendations, the Council selected the “Contingency Alternative” as the proposed action. Under this alternative, five Georges Bank access trips would be allocated in 2006 with the Closed Area I access trip reassigned to Closed Area II. In 2007, two access trips would be allocated (one in Closed Area I and one in Nantucket Lightship). Table 15 - Table 17 show the specifications for the proposed action.

- *Adjustments when YT Flounder catches reach the 10% TAC limit)*

Under current regulations, if the 10% yellowtail flounder TAC is reached and Georges Bank access areas close, vessels that have not taken trips are authorized to take up to two unused trips in the open fishing areas, but the regulations are silent about 2007. The Council proposes to allocate additional open area DAS for each trip not taken before areas close, but at a prorated value of DAS. Upon an area closure, each vessel with unused trips would be allocated a specific amount of additional open area DAS, based on this pre-defined ratio.

Hudson Canyon Area Rotation Measures

The Hudson Canyon area was initially closed in 1998 to protect a strong year class of young scallops. New data indicates that scallop biomass in the Hudson Canyon area in 2005 is much less than had been predicted by Amendment 10 from 2003 survey results. Catch rates dropped quicker than had been anticipated, and many vessels took sub-optimal trips in 2005 or chose to delay taking their 2005

access trips. The proposed action would extend the duration of the Hudson Canyon area access program until February 28, 2008 when the area would be open as a regular scallop fishing area.

Elephant Trunk Area (ETA) Rotation Measures

Amendment 10 closed the ETA to scallop fishing in July 2004 to protect two very strong year classes and anticipated that the scallops would reach optimum size for harvest in 2007. Framework 18 considered several alternatives for managing this access area when it re-opens including how many trips should be allocated, when the area should open and whether or not the area should be closed seasonally to reduce the risk of interactions with sea turtles and reduce scallop and finfish discard mortality.

- *Initial trip allocations*

The Council selected precautionary initial trip allocations and set-asides to achieve a fishing mortality target of 0.16, as compared to 0.32 under the status quo. The proposed action allocates five trips for full-time vessels and a proportionate amount for part-time and occasional vessels.

- *Re-opening date*

The Council determined that the Elephant Trunk Area should re-open early on January 1, 2007, rather than on March 1, 2007 as planned under Amendment 10.

- *Seasonal closure to potentially reduce sea turtle interactions in the Elephant Trunk Area and reduce scallop and finfish discard mortality*

During the 2007 fishing year, the ETA would be closed to scallop fishing for a two month period (September 1 - October 31) to possibly reduce sea turtle interactions. This alternative would close the redefined ETA when the majority of turtle catches were observed over the last two years, and minimize the potential economic impacts of a longer closure.

Procedures to adjust ETA allocations to account for uncertainty in 2007 ETA biomass estimates

The Council approved a rulemaking process that would allow the Regional Administrator to adjust allocations in the ETA based on updated biomass projections. The proposed action would allow adjustments to be made more quickly to ensure that the ETA allocations do not cause overharvesting. If biomass estimates are lower than projected, the number of access trips can be reduced quickly using event-triggered rulemaking.

Delmarva Area Rotation Closure

High numbers of small scallops from the 2003 year class were observed by the 2005 survey in many stations in the proposed Delmarva rotation area. Under the proposed action, the area would close in 2007 when the Elephant Trunk area opens (January 1, 2007). The Delmarva area would remain closed for three years until February 28, 2010 when the small scallops have grown sufficiently to be harvested.

Open Area Management

The open area DAS allocations are set annually and adjusted every two years to achieve optimum yield at the target fishing mortality ($F=0.2$) for the total scallop resource. Since the formula also includes the mortality in controlled access areas, the open area DAS allocations depend on what controlled access area management TACs are approved. This framework analyzed about a dozen options with different combinations of GB access areas, access into ETA, access into Hudson Canyon, and whether or not the Delmarva area would be closed in 2007. Based on the rotation area management decisions the Council made, their recommendation for open area DAS is 20,000 open area DAS. The specifications associated with 20,000 open area DAS translates based on the number of permits issued into 52 DAS for full-time vessels in 2006 and 51 DAS in 2007. Part-time vessels would be allocated 21 DAS in 2006 and 20 DAS in 2007, and occasional vessels would receive 4 DAS for both years.

Limited Access Crew Limits

The Council proposes to eliminate the 7 person crew limit (5 for small dredge vessels) on controlled access area trips. Under the proposed action, limited access vessels on a controlled access area

trip would have no limit on the number of crew onboard. This action is intended to alleviate negative impacts on the industry from increased fishing costs of the crew limit measure.

Trip Exchange Deadline

The proposed action would allow vessels to exchange controlled access area trip allocations at any time during the fishing year, with proper notification of an approval by NMFS. Amendment 10 required that transactions be completed within 90 days of when allocations were made, but when the administration was initiated it proved to be unnecessary for adequate monitoring and compliance. Therefore, the Council proposes to eliminate the June 1 deadline.

Controlled Access Area Trip Exchanges

The proposed action includes three measures to liberalize the trip exchange program: 1) one-to-one exchanges of 2006 GB access area trips and 2007 ETA trips; 2) one-to-one exchanges of GB access trips and unused 2005 Hudson Canyon area trips to be used in 2006; and 3) the Status Quo alternative - one-to-one exchanges of controlled access area trips for areas open to fishing during the same fishing year. Without the proposed action, Mid-Atlantic vessels would not be able to gain a Mid-Atlantic controlled access area trip in exchange for a Georges Bank controlled access area trip; because no Mid-Atlantic controlled access areas would be open to fishing.

Broken Trip Exemption Program

The broken trip exemption program allows vessels that return to port on a controlled access area trip to catch the remaining portion at a later date on a compensation trip. The Council recommends a 60-day carry forward provision to reduce business and safety risks. The Council did approve an additional reporting requirement for broken trips. The addition would establish an identification number for each compensation trip issued in response to a broken trip.

6.1.4.3 Minimizing or Mitigating Adverse Impacts

The overall habitat impacts of all the measures combined in this action, as depicted in Table 138, have minimal net effects relative to the baseline habitat protections established under Amendment 10 to the Atlantic Sea Scallop FMP as well as Amendment 13 to the Northeast Multispecies FMP. Therefore, measures to mitigate or minimize adverse effects on EFH are not necessary.

Table 138. Summary of Potential Impacts to Essential Fish Habitat by Proposed Action

PROPOSED ALTERNATIVES	Summary of Impacts to Essential Fish Habitat	Directional Effects on Essential Fish Habitat
Area Rotation Measures and Allocation		
AREA SPECIFIC LIMITS	Because the proposed action is not beyond the impacts analyzed and mitigated for in Amendment 10, the impacts to EFH will be minimal.	0
GEORGES BANK ACCESS		
Revise GB Area Access Schedule	The southern portion of Closed Area II is already impacted by scallop gear from the controlled access program but is generally considered less complex habitat than those found in Closed Area I. Because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.	0/+
Additional open DAS for YT TAC	While this may cause an increase in fishing in open areas, because the proposed alternative allows the scallop trips to be fished in areas not currently considered as Habitat Closed Areas, any adverse impacts to EFH will continue to be minimized.	- / 0
HUDSON CANYON AREA	This measure does not allocate any additional DAS or effort in the area but rather allows permit holders to fish the same allocation over a longer period of time. As such, there will be no additional habitat impacts as a result of this	

PROPOSED ALTERNATIVES	Summary of Impacts to Essential Fish Habitat	Directional Effects on Essential Fish Habitat
	measure.	0
ELEPHANT TRUNK AREA		
Initial trip allocations	A more precautionary allocation (f=0.16) is proposed than the status quo (F=0.32 under AM10). Thus, compared to status quo, this action has less impacts on EFH.	0 / +
Re-opening date	Because the number of trips into ETA is fixed at 5, the amount of fishing effort and area swept will likely not increase. Therefore, there are no recognizable impacts of this measure on EFH.	0
Protected Species Closure	Because the number of trips into ETA is fixed at 5, there are no recognizable impacts of this measure on EFH.	0
DELMARVA AREA	This would result in additional area closed to <i>open area</i> scallop fishing in the mid-Atlantic and could be considered positive for EFH as it would be closed to scallop fishing (bottom tending mobile gear) for three years.	+
Open Area Management		
DAS allocations	Overall, it is estimated that the proposed action will increase long-term area swept approximately 7% as compared to the status quo. However, it is impossible to determine where this new bottom contact will occur and in what types of habitats. It is important to note that the proposed measure does not propose any access or changes to the habitat closed areas.	-
Limited Access Crew Limits		
Eliminate 7 crew limit for access trips	No net increase in bottom contact time' therefore, fishing impacts on benthic environments are expected to be the same. Therefore, no additional habitat impacts are expected from this measure.	0
Trip Exchange Deadline		
Eliminate deadline	This measure is largely administrative and will have no discernible habitat impacts.	0
Controlled Access Area Trip Exchanges		
1 to 1 exchange for GB2006 and ET2007	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	0
1 to 1 exchange for unused GB trips and 2005 HC trips to be used in 2006	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	0
Status Quo - 1 to 1 exchange of access area trips for open area DAS	One-to-one exchanges for access area trips will not affect the amount and distribution of fishing effort. Therefore, no habitat impacts are anticipated from this largely administrative measure.	0
Broken Trip Exemption Program		
60 day carry over of compensations trips	Likely to have minimum habitat/biological effects over the long term. However, the short-term effects on EFH are unclear and may need to be considered during framework adjustments that re-specify future TACs.	- / 0

6.1.4.4 Conclusions

The action proposed under this framework adjustment should have no more than a minimal adverse effect on EFH of federally managed species. Because there are no substantial adverse impacts associated with this action, an abbreviated consultation may be the only required action.

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 2.1;
- The alternatives that were considered are described in section 3.0 (alternatives including the proposed action);
- The environmental impacts of the proposed action are described in section 5.0;
- The agencies and persons consulted on this action are listed in section 6.2.3.

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 the first page of this document.

A table of contents can be found in section 1.0.

Background and purpose are described in section 2.0.

A summary of the document can be found in the Executive Summary.

A brief description of the affected environment is in section 4.0.

Cumulative impacts of the proposed action are described in Section 5.4.

A determination of significance is in section 6.2.2.

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. This 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 2006 and 2007 by modifying the

rotational area management program implemented by Amendment 10. None of the modifications are expected to cause large increases in fishing mortality that would jeopardize the sustainability of the scallop resource. The action is designed to be consistent with the mortality targets adopted in Amendment 10.

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 4.2, and a complete bycatch analysis of the scallop fishery was completed in Amendment 10. Section 5.1.2 summarizes the impacts of the proposed action on non-target species. In general, this action does not increase overall fishing effort above levels assessed in Amendment 10, 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. In addition, since closed areas are considered beneficial to the recovery of thorny and barndoor skate, this document analyzes the impacts of controlled access into portions of the mortality closed areas on skate rebuilding (Section 6.1.3.1). 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. The conclusion in the EFH Assessment (Section 0) is that this action will have minimal impact on EFH. This action will not change the measures put in place under Amendment 10 to reduce impacts on EFH. 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.

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. In fact, this action proposes several measures designed to improve flexibility of the management program and safety at sea. Specifically, the measure that eliminates the crew limit is expected to have positive impacts on safety by allowing vessels to carry as many crewmembers as they deem appropriate. This measure may reduce fatigue and allow crew to work more reasonable shifts. In addition, this action proposes several modifications to trip exchange and broken trip provisions. These modifications improve flexibility, allowing vessels to trade trips for certain access areas that could have safety issues for those vessels. Furthermore, allowing vessels to carry trips forward into the next fishing year may help prevent vessels from taking trips at the end of a fishing year when weather conditions are poor.

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. In addition, Attachment B is a list of the endangered, threatened and other protected species in the region. Section 5.1.3 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. This action does include a measure specifically designed to reduce potential interactions with scallop gear and sea turtles in the Mid-Atlantic (seasonal closure in the ETA) as well as measures that will: maintain the Hudson Canyon Access Area as a controlled access area, create a new closure area in the Mid-Atlantic (Delmarva Area), and re-open the Elephant Trunk Area (ETA) as a controlled access area. Limiting and controlling scallop fishing effort in Mid-Atlantic areas where sea turtle interactions with the scallop fishery are known to have occurred is expected to help reduce the likelihood of further interactions in those areas. The alternative to close the Elephant Trunk Area (ETA) to scallop fishing from September 1 to October 31 to protect sea turtles would remove scallop fishing effort from this area during a period when the majority of sea turtle interactions with scallop dredges have occurred in the ETA (Table 33). Although shifts in fishing effort and changes in fishing practice may occur as a result of these measures, it is always difficult to predict how measures will affect fishing behavior and consequently sea turtle interactions. However, there is no information at this time to suggest that interactions between sea turtles and scallop fishing gear will increase as a result of the measures.

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 4.4 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 established under Amendment 10; 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. A discussion of the impacts of the proposed action is presented in Section 5.0 of this document. 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. The proposed action will modify the rotational area management program, overall improving flexibility and performance of the program, which will have positive impacts on the long-term success of the program, thus positive impacts on the human environment. Sections 5.2 and 5.3 assess both the economic and social impacts of the proposed action, and Section 5.4.4.5 describes the potential cumulative effects of this action on the human environment. Overall, the proposed action is expected to have positive impacts on landings and revenues, thus beneficial for the human environment and is not likely to be highly controversial.

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 5.4 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 adverse impact. In summary, the sea scallop resource, non-target species, protected species, habitat, 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, overall improving flexibility and performance of the program, which will have positive impacts on the long-term success of the program at preventing overfishing and achieving optimum yield.

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. In 2002, an invasive colonial sea squirt (*Didemnum sp.*) was observed on Georges Bank. The tunicate occurs on pebble gravel habitat, and does not occur on moving sand. NMFS has surveyed the area and is monitoring the growth. At this time, there is no evidence that fishing spreads this species more than it would spread naturally. 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 as “valued ecosystem components” (VECs). Therefore, the direct, indirect, and cumulative impacts of the proposed action on these VECs have been discussed (Section 5.4.4). In general, this action will modify the rotational area management program, overall improving flexibility and performance of the 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 18, and in the SEIS for Amendment 10 to the Sea Scallop Fishery Management Plan, it is hereby determined that Framework 18 will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

Assistant Administrator for Fisheries, NOAA

Date

6.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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Framework Adjustment 18 was prepared and evaluated in consultation with the National Marine Fisheries Service and the Mid-Atlantic Fishery Management Council. Members of the Groundfish PDT, the Scallop PDT, the Skate PDT and the Habitat Technical Team reviewed portions of analyses and provided technical advice during the development of the Environmental Assessment. In addition, certain members and other people contributed data and technical analyses for the document, including Dr. Dvora Hart (NMFS, Woods Hole, MA; scallop and bycatch biological projections), Dr. Julie Olsen (NMFS, Woods Hole, MA; Social Impact Analysis), and Dr. Kevin Stokesbury (SMAST, New Bedford, MA; video survey scallop density estimates stratified by management area and statistical analysis of video survey data to estimate scallop biomass in the access areas). Draft text and analyses were also contributed by the Council's technical staff members including Andrew Applegate (biological analysis, allocation estimates, and miscellaneous sections), Dr. Demet Haksever (economic analysis and Regulatory Flexibility Act analysis), Deirdre Boelke (skate baseline review and miscellaneous sections), Patricia Fiorelli (impacts on protected species), Leslie-Ann McGee (impacts on essential fish habitat), and Christopher Kellogg, Deputy Director of the NEFMC.

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 June 2005 through November 2005 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Scallop Oversight Committee	Radisson Airport Hotel, Warwick, RI	6/1-2/05
Scallop Oversight Committee	Holiday Inn, Boston, MA	7/19/05
Scallop Oversight Committee	Hilton Garden Inn, Warwick, RI	8/3/05
Scallop Oversight Committee	Four Points by Sheraton, Revere, MA	9/7-8/05
Council Meeting	Eastland Park Hotel, Portland, ME	6/23/05
Council Meeting	Providence Biltmore, Providence, RI	9/14/05
Council Meeting	Four Points by Sheraton, Hyannis, MA	11/17/05

6.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the scallop fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document. For further information on the potential impacts of the fishery and the proposed management action on listed and other protected species, see Section 5.1.3 of this document.

The Council acknowledges that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal. The NEFMC is now seeking the concurrence of the NOAA Fisheries Service with respect to Framework Adjustment 18.

6.4 Marine Mammal Protection Act

The NEFMC has reviewed the impacts of the scallop fishery and this proposed action on marine mammals and has concluded that the alternatives being considered are consistent with the provisions of the MMPA and will not alter existing measures to protect the species inhabiting the scallop management unit, such as take reduction plans. Although interactions with small cetaceans and seals are now documented in the scallop fishery, observer coverage to date indicates these are relatively rare events. This conclusion may change as more information becomes available.

6.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The Council reviewed the approved coastal zone management plans of the following states to determine the consistency of the FW 18 with the enforceable policies of the state programs: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The Council has determined that the proposed action is consistent to the maximum extent possible with the enforceable policies of the coastal zone management programs of these states and has notified them of this determination, providing them also with a copy of this document. A list of the specific state contacts and a copy of the letters are available upon request.

6.6 Administrative Procedure Act

Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

6.7 Data Quality Act

Pursuant to NOAA guidelines implementing section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

6.7.1 Utility

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage

public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.

This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

6.7.2 Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

6.7.3 Objectivity

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Scallop Plan Development Team. Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available.

The policy choices are clearly articulated in section 3.0 of this document as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in section 5.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent

practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

6.8 Executive Order 13158 (Marine Protected Areas)

The Executive Order on MPAs requires Federal agencies whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs Federal agencies to refer to the MPAs identified in a list developed and maintained by the Departments of Commerce and Interior. As of the date of submission of this document, however, the List of MPAs has not yet been developed. No further guidance related to this E.O. is available at this time.

6.9 Executive Order 13132 – Federalism

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in the FW 18. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

6.10 Executive Order 12898 – Environmental Justice

Executive Order (E.O.) 12898 requires that, "to the greatest extent practicable and permitted by law each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions..." The outcomes that have been predicted in this framework adjustment may differentially affect some populations. Nonetheless, many of the participants in the scallop industry may come from lower income and or ethnic minority populations. These populations may be more vulnerable to more restrictive management measures. For example, in many ports crew may be comprised of ethnic minorities, and many regions in which fishing is an important livelihood can also be economically impoverished.

6.11 Paperwork Reduction Act

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. Framework 18 continues existing data collection requirements, with one additional requirement. Under this action, vessels would be required to record a trip ID relative to the broken trip program.

6.12 Initial Regulatory Flexibility Act/E.O. 12866

6.12.1 Introduction

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.”

The main elements of the RFA are fully discussed in several sections of the Framework 18 document, and the relevant sections are identified by reference to this document. The impacts of the individual measures and the combined impacts of the proposed alternatives are summarized in Section 6.12.2.3 below.

Problem Statement and Objectives

The purpose of the action and need for management (statement of the problem) is described in Section 2.1 of the Framework 18 document.

Management Alternatives and Rationale

The proposed action is described in Section 3.1. Alternatives to the proposed action are summarized in Section 3.2 (no Action) and Section 3.3 (other alternatives). Economic impacts are examined in various subsections of Section 5.2 as identified in Section 6.12.2.3 below.

6.12.2 Determination of Significant Economic Impact on a Substantial Number of Small Entities

6.12.2.1 Description of the small business 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 \$3.5 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 2004 fishing year (Figure 4 and Table 37, Section 4.5.3, Table 53 in Section 4.5.4). These entities were described in detail Section 4.5 of Framework 18. According to this information, annual scallop revenue averaged about \$759,816 per full-time vessel, \$208,002 per part-time vessel, and \$7,193 per occasional

vessel during the period 1999-2004 fishing years (Table 38, Section 4.5.3 of Framework 18). Total revenues per vessel, including revenues from species other than scallops, exceeded these amounts, but were less than \$3 million per vessel. Table 39 of Framework 18 shows the revenues per full-time vessels by gear type and Table 41 by tonnage class.

The proposed regulations of Framework 18 would affect vessels with limited access scallop and general category permits. Section 4.5 (Description of the Fishery) of Framework 18 document 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 information on the number and characteristics of vessels by the region of their principal port and permit category are also shown in Appendix I, SAFE 2005. The current information on the number of scallop permits for the years 1994 to 2004 are provided in Table 35 in Section 4.5. According to the recent permit data, there were 300 vessels that obtained full-time limited access permits in 2004, including 47 small-dredge and 14 scallop trawl permits. In the same year, there were also 30 part-time and 7 occasional limited access permits in the sea scallop fishery. In addition, 2,801 permits were issued to vessels in the open access General Category. Therefore, the proposed alternatives of Framework 18 are expected to have impacts on a substantial number of small entities.

6.12.2.2 Determination of significant effects

The Office of Advocacy at the SBA suggests two criteria to consider in determining the significance of regulatory impacts, namely, disproportionality 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 18 is not expected to have significant regulatory impacts on the basis of the disproportionality criterion for the following reasons:

1. The majority of the permit holders in the sea scallop fishery are considered small business entities.
2. The alternatives included in this Framework, including the proposed action and the non-preferred alternatives, propose to allocate open area DAS and controlled access area trips in the same proportion for each category of the limited access scallop permit compared to the no-action levels. The resulting changes in profits, costs, and net revenues are not expected to be disproportional for small versus large entities for this reason, and also for the reason that the majority of the vessels that participate in the scallop fishery are small business entities.
3. The proposed action and the non-preferred options are 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. The aggregate impacts of the proposed measures on revenues, costs, and producer benefits are summarized in Section 5.2.1 and were contrasted with the estimated values for no action. The economic impacts of the individual measures considered by this Framework, are analyzed in relevant subsections of Section 5.2.2 as identified below. The following section provides a summary of the economic impacts from the proposed measures, compares these with the impacts from significant alternatives and discusses the mitigating factors. The relevant section of Framework 18, which discusses the rationale of each measure is also identified.

6.12.2.3 Economic impacts of the proposed measures and alternatives

6.12.2.3.1 Summary of the aggregate economic impacts

The aggregate economic impacts of the proposed measures and other alternatives including controlled access area allocations, modified Elephant Trunk reopening and Groundfish closed area access, extended Hudson Canyon access program, area closures (Delmarva), and open area DAS allocations are analyzed in Section 5.2.1 relative no action. No action here refers to continuation the Framework 18 rotation order with Hudson Canyon (HCA), Elephant Trunk (ETA) areas fully open and no closures in Delmarva (DMV) combined with a total open area DAS of 24700 days. The impacts on vessel revenues and profits are expected to be similar to the impacts of the proposed measures on total fleet revenue and producer surplus estimated in Section 5.2.1. Distributional impacts of these measures could differ, however, as discussed in subsections of Section 5.2.2 and summarized below in connection with the impacts of individual measures.

- The aggregate impacts of the proposed area rotation measures are expected to be slightly positive on the majority of small business entities in scallop fishing industry during 2006-07. Overall fleet revenue and therefore, annual scallop revenue for an average limit access vessel is estimated to increase marginally (by 1.06% on the average) compared to no action during 2006-2007. Because fishing costs are estimated to increase due to the allocation more access area trips with the proposed measures, the impacts on the net revenue (revenue minus variable costs) and vessel profits will be negligible (0.1% increase per year) over the two year period from 2006 to 2007 (Table 139, Section 6.13, RIR).
- The long-term (2008-2019) economic effects of the proposed measures are estimated to be slightly negative on revenues (an average 1.27% decline per year, Table 101, Section 5.2.1.2) and negligible on producer surplus (0.1% decline per year, Table 139, Section 6.13, RIR). Since no action scenario results in higher price due to lower landings, revenues under this scenario would exceed the revenues for the proposed measures depending on the assumptions regarding changes in export, imports, disposable income, consumer preferences and composition of landings by market size category in the future years as discussed in Section 5.2.1.5. Expansion of the export markets for the U.S. sea scallops, for example, has helped to prevent price declines in the recent years despite the record increase in scallop landings, and could increase prices and scallop revenues over the long-term as well benefiting the small business entities in the scallop fishery.
- Other measures proposed by Framework 18, such as one to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips, of Georges Bank access trips and unused 2005 Hudson Canyon area trips, 60 day carry forward of compensation trips, early opening of ETA and elimination of trip exchange deadline are expected to provide additional positive impacts by providing vessels more flexibility in choosing the areas and time of fishing that will maximize their profits.
- The aggregate impacts of the proposed measures could differ from the economic impacts of the individual measures as discussed in the relevant subsections of Section 5.2.2 and summarized in the following section.

6.12.2.3.2 Economic impacts of the individual measures

The following provides a summary of the impacts of each individual measure proposed by Framework 18 on small business entities and a discussion of the mitigating factors and significant alternatives considered by the Council:

Economic impacts of area specific limits on fishing by limited access vessels:

- Rationale is provided in Section 3.1.1.
- Economic Impacts are analyzed in Section 5.2.2.1.
- **Summary of the impacts of the proposed option and mitigating factors:** Area specific trip allocations and possession limits help to prevent overfishing in access areas, preventing reduction in future yield, and in social and economic benefits from the scallop fishery. Although possession limits increase fishing costs by lowering flexibility for vessels about how many trips to take to land the allocated amounts, it also prevents derby style fishing, resulting in more stable landings and less fluctuation in prices over time. Overall, these positive economic impacts are expected to outweigh the negative impacts due to reduced flexibility to vessels from limits on trip landings.
- **Comparison of the impacts of the alternative options:** By eliminating the possession limits, the non-preferred alternative would lower the fishing costs for vessels that could land their area specific allocations by taking fewer trips compared to the number of trips they need to take if there was a possession limit per trip. Therefore, this measure could increase producer benefits, including the crew income. The economic benefits will be lower, however, if the incentive to catch the quota at the shortest possible time creates a race to fish and reduces LPUE (Section 5.2.2.1). In addition, the concentration of landings during high catch seasons could dampen the prices and reduce the economic gains. Combined with the elimination of crew limits in controlled access areas, this measure could reduce the long-term revenues, profits and total economic benefits if vessels with large crews start targeting smaller scallops in those areas, leading to overfishing of the scallop resource.

Economic impacts of Georges Bank area access measures:

- Rationale is provided in Section 3.1.2.1.
- Economic impacts are analyzed in Section 5.2.1 and 5.2.2.2.
- **Summary of the impacts of the proposed option and mitigating factors:** Because the proposed contingency access schedule allocates 5 trips to Georges Bank access areas compared to the no action schedule of a total two trips in 2006, it is expected to have positive impacts on landings, revenues and gross profits of small businesses. Similarly, the economic impacts of proposed Georges Bank area access measures combined with proposed measures for Hudson Canyon, Delmarva and Elephant Trunk areas and 20,000 open area DAS are estimated to be slightly positive for limited access vessels in the short-term as summarized above under the aggregate impacts above. The proposed contingency schedule could have some negative impacts in 2006 on some general category vessels, however, since it may not be possible for many of these smaller boats to access Closed Area II to substitute for the Closed Area I trips. These short-term negative impacts are expected to be minimal since general category vessels could take more trips in the open areas of Georges Bank and/or Mid-Atlantic to compensate for the trips they couldn't take to Closed Area I. The closure of Closed Area I access area in 2006 will protect scallops in this small area from overfishing, and therefore will result in higher future benefits for both the limited access and general category vessels when it is reopened to fishing in 2007. These long-term benefits are expected to outweigh short-term loss from the closure of CAI.
- **Comparison of the impacts of the alternative options:** No action and status quo alternatives would allocate less trips to the Georges Bank access areas and will, therefore, have lower economic benefits compared to the proposed access. The economic impacts of the original preferred alternative on small business entities (allowing the limited access and general category vessels to fish in all three access areas in 2006) would be similar to the proposed contingency schedule because the total number of controlled access trips are the same under both alternatives. Although this alternative will provide general category vessels (and the limited access vessels) the opportunity to fish in CAI in 2006, it could also increase the risk of localized overfishing as many vessels access this small area. As a result, this alternative could lower revenues and profits

for both limited access and general category vessels over the long-term and when this area is reopened in 2007.

Economic Impacts of adjustments when yellowtail flounder catches reach the 10% TAC limit:

- Rationale is provided in Section 3.1.2.2.
- Economic Impacts are analyzed in Section 5.2.2.3.
- **Summary of the impacts of the proposed option and mitigating factors:** The preferred alternative will help to minimize the loss in pounds and revenue due to the closure of access areas before a vessel takes its trip. It will thus have a positive impact on vessels although the scallop pounds per trip could be lower than the allocated pounds for the Georges Bank access area trips due to prorating.
- **Comparison of the impacts of the alternative options:** One of the non-preferred alternatives would allocate an equal number of open area trips with an 18,000 possession limit for each trip not taken before areas close from yellowtail flounder catches. Although this alternative would minimize the loss in revenue compared to the preferred alternative, it could result in negative long-term impacts on the scallop resource and negative economic benefits for the small business entities could be negative since the transferred trips in the open areas could increase fishing mortality and take longer than in the access areas. Alternative three, to allocate half the access trips would prevent any shift of effort into open areas, but each vessel would be allocated less trips if the TAC is reached, thus would lower revenues as compared to the preferred alternative. The status quo alternative would allow vessels to fish 12 DAS in open areas for up to two trips not taken before areas close from yellowtail flounder catches. This alternative would have a negative economic impact on vessels that could not take 3 or more of their trips in the controlled access areas.

Economic impacts of Hudson Canyon Area rotation measures

- Rationale is provided in Section 3.1.3.
- Economic Impacts are analyzed in Section 5.2.1 and Section 5.2.2.4.
- **Summary of the impacts of the proposed option and mitigating factors:** Section 5.2.1 provides a comparative analysis of the economic impacts of these measures combined with Elephant Trunk reopening, GB access alternatives, area closures (Delmarva), and open-area DAS allocations. The combined impacts of these measures on small business entities are summarized above in the discussion of aggregate impacts. Extension of the Hudson canyon area access program, by itself, is expected to have positive economic impacts because the vessels could lower their costs and increase their profits by taking trips when catch rates increase relative to the 2005 levels (Section 5.2.2.4).
- **Comparison of the impacts of the alternative options:** There are no significant alternatives to the proposed measures other than the no action alternative of converting HCA to a fully open area without allowing vessels to take any 2005 access trips in the future. No action will result in slightly lower revenues and profits for small business entities in the short-term and negligible impacts over the long-term compared to the proposed action (as discussed above in connection with aggregate impacts).

Economic impacts of Elephant Trunk area (ETA) rotation measures - precautionary initial trip allocations and set-asides

- Rationale is provided in Section 3.1.4.1.
- Economic Impacts are analyzed in Section 5.2.2.5.1.
- **Summary of the impacts of the proposed option and mitigating impacts:** The comparative economic impacts of this measure were analyzed in Section 5.2.1 as a part of the 10 rotation area alternatives. Although landings and revenues with the precautionary initial trip allocations will

be less in 2007 compared to the level of landings and revenues if this area was fully open, this action, by itself, will increase yield from the scallop fishery over the long-term, thus, would have positive economic impacts on small business entities. This measure could have negative economic impacts, however, on the general category scallop vessels because it limits the maximum catch from this vessel category. On the other hand, if the general category catches are not controlled, the landings from this area could exceed the fishing mortality targets, reduce the scallop biomass and yield in the future. This could result in lower allocations in the future for both the limited access and general category vessels and reduce the net economic benefits from the scallop resource.

- **Comparison of the impacts of the alternative options:** Only alternatives to the proposed measures are the no action alternative of converting ETA to a fully open area and status quo alternative of allocating 9 trips to this area. No action will result in slightly lower revenues and profits for small business entities compared to the proposed action in the short-term and negligible impacts over the long-term as summarized above (in connection with aggregate impacts).

Economic impacts of re-opening of Elephant Trunk Area to controlled access fishing on January 1, 2007:

- Rationale is provided in Section 3.1.4.2.
- Economic Impacts are analyzed in Section 5.2.2.5.2.
- **Summary of the impacts of the proposed option and mitigating factors:** This alternative will have positive economic impacts on small business entities by helping to spread out fishing effort and landings over time, by providing vessels more flexibility about when to fish. Thus the fishing revenues would be more stable and costs of fishing would be lower compared to an opening on March 1, 2007, the beginning of the fishing year.
- **Comparison of the impacts with the alternative options:** Alternative to the proposed measure is the status quo opening in March 1, 2007, which has lower benefits than the preferred alternative.

Economic impacts of seasonal closure of the Elephant Trunk area:

- Rationale is provided in Section 3.1.4.3.
- Economic Impacts are analyzed in Section 5.2.2.5.3.
- **Summary of the impacts of the proposed option and mitigating factors:** Proposed alternative can have negative economic effects on scallop fishermen by reducing their flexibility in choosing when to fish and by increasing the costs of fishing. Furthermore, seasonal closures can cause spikes in landings which can have negative effects on price and revenues. The negative economic impacts of this closure is expected to be minimal, however, because the area will be closed only for two months, during September and October, during which the vessels could fish in the open areas. These relatively small negative impacts could also be outweighed by the positive impacts from reducing finfish bycatch and sea turtle interactions, by lowering the possibility of more stringent controls on scallop fishery and negative economic impacts on small business entities in the future.
- **Comparison of the impacts with the alternative options:** The preferred alternative will minimize these negative impacts on fishing costs relative to other closure alternatives. The alternative options close ETA for a longer period, one alternative from July 15 to October 31st and another alternative from June 15 to November 14, and thus could have larger negative impacts on vessels.

Economic impacts of procedures to adjust Elephant Trunk Area (ETA) and open area allocations to account for uncertainty in 2007 Elephant Trunk area biomass estimates:

- Rationale is provided in Section 3.1.5.
- Economic Impacts are analyzed in Section 5.2.2.6.
- **Summary of the impacts of the proposed option and mitigating factors:** The preferred alternative (rulemaking procedure) is expected to have positive economic impacts by ensuring that landings and economic benefits do not fall below the sustainable levels by making timely adjustments to management measures when new ETA biomass data becomes available.
- **Comparison of the impacts with the alternative options:** There are no significant alternatives other than status quo alternative, which has lower benefits on small business entities compared to proposed action.

Economic impacts of Delmarva closures:

- Rationale is provided in Section 3.1.6.
- Economic Impacts are analyzed in Section 5.2.2.7.
- **Summary of the impacts of the proposed option and mitigating factors:** The impacts of closing Delmarva, by itself, could have negative impacts on small business entities in the short-term, but positive impacts over the long-term by increasing yield from the scallop resource. It could also have negative economic impacts on some vessels which mainly fish in Mid-Atlantic areas, by narrowing the fishing grounds they could use for their open-area days. Some of these negative economic impacts may be mitigated by the re-opening of the Elephant Trunk area in 2007. When combined with other measures, however, the impacts will be positive on the revenues and profits the small business entities in the short-term and negligible over the long-term (as summarized above in aggregate impacts).
- **Comparison of the impacts with the alternative options:** Only alternatives to the proposed measures are the no action alternative of keeping Delmarva fully open. No action will result in slightly lower revenues and profits for small business entities compared to the proposed action in the short-term and negligible impacts over the long-term as summarized above (in connection with aggregate impacts).

Economic impacts of open area management

- Rationale is provided in Section 3.1.7.
- Economic Impacts are analyzed in Section 5.2.3.
- **Summary of the impacts of the proposed option and mitigating factors:** This measure will prevent overfishing in open areas and a decline in future yield, thus, it will have positive impacts on revenue and profits of small business entities. The economic impacts of the open area DAS allocation alternatives combined with other measures regarding controlled access (Georges Bank, Hudson Canyon, ETA) and area closures (Delmarva) are examined in detail in Section 5.2.1.
- **Comparison of the impacts with the alternative options:** Alternatives to the proposed measures are the no action alternative and other alternatives that allocate 15,000 DAS to 30,000 DAS for open areas instead of 20,000 open area DAS with the proposed action. No action will result in slightly lower revenues and profits for small business entities compared to the proposed action in the short-term and negligible impacts over the long-term as discussed above (in connection with aggregate impacts). None of other alternatives will have significantly different impacts than the proposed action, however, in the short- and the long-term as indicated by changes in revenues and producer surplus shown in Tables 90 to 96 in Section 5.2.1.

Economic impacts of the elimination of crew limits for controlled access areas

- Rationale is provided in Section 3.1.8.
- Economic Impacts are analyzed in Section 5.2.5.
- **Summary of the impacts of the proposed option and mitigating factors:** Eliminating the crew limit for limited access vessels is expected to lower total fishing costs, increase total benefits for

crew and the vessel-owners, but reduce income per crew member. This measure could have negative economic impacts, however, if there is a race to fish by many vessels employing a large crew to fish before catch rates per day decline or before the area is closed due to bycatch. Furthermore, if unlimited crew size leads to smaller scallops being landed, then both the immediate impacts (if price falls) and long-term impacts (when harvesting smaller scallops affects future landings) would be negative. On the other hand, the existing regulations which set possession limits for access areas could mitigate some of these negative impacts by limiting the trip duration.

- **Comparison of the impacts with the alternative options:** There were no significant alternatives other than the status quo, which is a continuation of the 7-men crew limit. Status quo option would have opposite impacts compared to the proposed crew limit elimination as discussed above.

Economic impacts of the elimination of the June 1 deadline for controlled access area trip exchanges

- Rationale is provided in Section 3.1.9.
- Economic Impacts are analyzed in Section 5.2.5.1
- **Summary of the impacts of the proposed option and mitigating factors:** Elimination the deadline is expected to have positive economic impacts by providing greater flexibility for vessel owners and fishermen to respond to existing conditions, and to lower fishing costs as well as business and safety risks.
- **Comparison of the impacts with the alternative options:** There were no significant alternatives other than the status quo, which is a continuation of June 1 deadline. Status quo option would have lower benefits on small business entities compared to the proposed action.

One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel

- Rationale is provided in Section 3.1.10
- Economic Impacts are analyzed in Section 5.2.5.2.
- **Summary of the impacts of the proposed option and mitigating factors:** Allowing vessels that are closer or prefer to fish in the Georges Bank access areas than in the Elephant Trunk Area (and vice versa) to exchange their trips with another vessel will have positive economic impacts on the small business entities. This is expected to provide flexibility to vessels regarding which areas to fish, thereby reducing fishing costs without changing the total number of trips allocated in each area during a fishing year. Although there will be some short-term costs to vessels from postponing 2006 Georges Bank access area trips, it is possible for the exchanging vessel owners to negotiate compensation for the postponed landings, thus mitigate the short term costs for one of the exchanging vessels.
- **Comparison of the impacts with the alternative options:** There were no significant alternatives other than the status quo, which would have lower benefits on small business entities compared to the proposed action.

One to one exchanges of controlled access area trips and for controlled access area trips during the same fishing year (status quo)

- Rationale is provided in Section 3.1.10 and Section 3.3.5.3
- Economic Impacts are analyzed in Section 5.2.5.5.
- **Summary of the impacts of the proposed option and mitigating factors:** The status quo alternative proposed by Framework 18 will not require changes in the regulations. It will have positive impacts on vessels by providing more flexibility about which access areas of Georges Bank to fish in the same fishing year, thus, will help them to lower their fishing costs and increase profits. This action will not allow, however, exchanges between yearly allocations or with the

open area allocations. As a result, this measure will ensure that fishing effort and scallop mortality in the open areas will not exceed the targeted amount or to reduce future yield, social and economic benefits from the scallop resource.

- **Comparison of the impacts with the alternative options:** The non-preferred alternative would provide one to one exchanges of controlled access area trips for areas open to fishing during the same fishing year. Although, this program would have positive economic impacts on the exchanging vessels, thus on small business entities, it could also have negative overall impacts on economic benefits if it increases fishing mortality of scallops as discussed in Section 5.2.5.3.

One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year

- Rationale is provided in Section 3.1.10.
- Economic Impacts are analyzed in Section 5.2.5.4.
- **Summary of the impacts of the proposed option and mitigating factors:** Overall economic impacts of this alternative were analyzed in combination of the area rotation measures and as a part of the Hudson Canyon Area management alternative. This measure is expected to have positive economic impacts by allowing the vessels to delay their unused trips until conditions improve and more catch per DAS could be landed than currently possible. In the same way, providing vessels the flexibility to take unused compensation trips in 2006 or 2007 due to a broken trip would not force the vessel to take those trips during the 2005 fishing year when resource conditions are less favorable.
- **Comparison of the impacts with the alternative options:** There are no significant alternatives other than the status quo option, which does not allow exchanges Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year. This option would lower the benefits for the small business entities.

Economic impacts of broken trip exemption program (60-day carry forward)

- Rationale is provided in Section 3.1.11.
- Economic Impacts are analyzed in Section 5.2.5.6.
- **Summary of the impacts of the proposed option and mitigating factors:** This action would have positive impacts on vessels by reducing the risk associated with trips taken at the end of a fishing year, or at the end of a seasonal access program, and lowering any revenue loss if the compensation trips could not be taken at the end of the same fishing year due to weather or other factors.
- **Comparison of the impacts with the alternative options:** There are no significant alternatives that would generate higher benefits for the small business entities.

6.12.2.4 Indirectly affected industries

The overall impacts of the proposed measures on regional revenues and incomes will be higher than the estimates given above because of the indirect and induced impacts. 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. These sectors are listed in Table 368, Section 9.2.4.1 of Amendment 10 FSEIS. The sales multiplier for the coastal counties in the Northeast was estimated to be approximately 1.8 in 1997 for the scallop dredge and trawls. Given that the impacts on fleet revenues were marginally different with the measures proposed by this framework action to no action, the changes in regional sales and incomes are not expected to be significant.

6.12.2.5 Identification on Overlapping Regulations

The proposed regulations do not create overlapping regulations with any state regulations or other federal laws.

6.12.2.6 Conclusion

The preceding Initial Regulatory Flexibility Analysis and the relevant sections of RIR indicate that the regulations proposed in Framework 18 will have not “significant impacts” on a substantial number of small businesses.

6.13 Regulatory Impact Review

6.13.1 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 1980 (RFA).

This RIR summarizes the effects of the proposed management plan and other alternatives considered in this framework that has been developed to rebuild the scallop resource. The Framework 18 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 2.1. The description of fishery is provided in Section 4.5 of Framework 18.

6.13.2 Economic Impacts

Section 5.2 evaluated economic impacts of Framework 18 proposed measures and alternatives considered by the Council. Sources of uncertainty are identified in Section 5.2.1.5. The aggregate economic impacts of the proposed rotation alternatives are analyzed in Section 5.2.1. The numerical results are presented in the tables included in those sections. The individual measures considered by Framework 18 are discussed in Sections 5.2.2 through 5.2.6 and the relevant subsections shown below:

- Economic impacts of the rotation area alternatives: Section 5.2.1
 - Summary of economic impacts: Section 5.2.1.1
 - Aggregate economic impacts in the short- term (2006-2007): Section 5.2.1.2
 - Aggregate economic impacts in the long-term (2008-2019): Section 5.2.1.3
 - Economic impacts of no action and status quo alternatives: Section 5.2.1.4
 - Discussion of prices, costs and sources of uncertainty in the analyses: Section 5.2.1.5
- Economic impacts of controlled access area alternatives, area specific limits, trip and quota allocations: Section 5.2.2
 - Area specific limits on fishing by limited access vessels: Section 5.2.2.1
 - Georges Bank area access measures: Section 5.2.2.2

- Adjustments when yellowtail flounder catches reach the 10% TAC limit: Section 5.2.2.3
- Hudson Canyon Area Rotation Measures: Section 5.2.2.4
- Elephant Trunk area (ETA) rotation measures: Section 5.2.2.5
- Precautionary initial trip allocations and set-asides: Section 5.2.2.5.1
- Re-opening of Elephant Trunk Area to controlled access fishing on January 1, 2007: Section 5.2.2.5.2
- Seasonal closure of the Elephant Trunk area: Section 5.2.2.5.3
- Procedures to adjust Elephant Trunk Area (ETA) and open area allocations to account for uncertainty in 2007 Elephant Trunk area biomass estimates: Section 5.2.2.6
- Economic impacts of Delmarva closures: Section 5.2.2.7
- Open area management: Section 5.2.3
- Economic Impacts of the elimination of crew limits for controlled access areas: Section 5.2.4
- Economic Impacts of the controlled access area trip exchanges: Section 5.2.5
 - Economic Impacts of the elimination of the June 1 deadline for controlled access area trip exchanges: Section 5.2.5.1
 - One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel: Section 5.2.5.2
 - Exchanges of 2006 Georges Bank access trips and other open access areas with another limited access vessel (status quo) : Section 5.2.5.5
 - One to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year: Section 5.2.5.4
 - Economic impacts of broken trip exemption program (60-day carry forward) : Section 5.2.5.6

The Initial Regulatory Flexibility Analysis, which evaluates the impacts of management alternatives on small businesses, is provided in Section 6.12.

6.13.2.1 Summary of Regulatory Impacts

The combined economic impacts of the proposed regulations on scallop fishery, consumers and on total economic benefits to the nation are analyzed in Section 5.2.1, and the economic impacts of the individual measures are discussed in 5.2.2. The economic costs and benefits of the proposed measures are compared with the no action alternative. No action here refers to continuation the Framework 18 rotation order with Hudson Canyon (HCA), Elephant Trunk (ETA) areas fully open and no closures in Delmarva (DMV) combined with a total open area DAS of 24700 days. Status quo scenario is based on the same assumptions, except that Elephant Trunk would be open as an access area in 2007 with 9 trips per full-time vessel allocated in 2007.

Summary of the impacts of the individual measures:

- Area specific allocations combined with possession limits are expected to have positive impacts by preventing overfishing in the access areas and reducing incentives for derby style fishing. These benefits are expected to outweigh the negative impacts from reduced flexibility for vessels and increase in fishing costs. Since this action is equivalent to the status quo management, it is not expected to change economic and social benefits.
- Proposed Georges Bank access measures and contingency schedule will positive economic benefits in the short and the long-term due to the allocation of more trips to the access areas, and shifting CAI trips to CAII to prevent reduction of future landings and revenues from this area. Additional open area DAS for yellowtail TAC will help to minimize the loss in pounds and revenue due to the closure of access areas before a vessel takes its trip, thus will have a positive economic impacts on scallop fishery.

- Extension of the Hudson canyon area access program will have positive economic impacts by spreading out effort over time and reducing fishing mortality in 2005, thus helping to improve yield and economic benefits in future.
- The economic impacts of the precautionary initial trip allocations for the Elephant Trunk area (ETA) will lower landings and revenues compared to the no action and status quo options in 2007. The proposed measure could also have some distributional impacts on general category vessels by limiting the maximum number of trips at 2% of the TAC. Over the long-term, however, the net economic benefits from the proposed alternative will exceed the economic benefits compared to status quo and no action alternatives because proposed access schedule will help to prevent overfishing and increase scallop biomass and future yield from this area. Reopening of this area in January 1, 2007 instead of March 1, 2007, will have positive economic impacts by helping to spread out fishing effort and landings over time, by providing vessels more flexibility about when to fish. The proposed closure of ETA from September 1 to October 31st could have some negative economic impacts by increasing fishing costs due to reduced flexibility for vessels. These negative economic impacts are expected to be minimal and to be outweighed by the positive impacts from lower finfish bycatch and sea turtle interactions, preventing the possibility of more stringent controls on scallop fishery and a reduction in economic benefits in the future. The proposed procedure to adjust ETA allocations is expected to have positive economic impacts by ensuring that optimum yield is achievable even if there is insufficient time to develop a framework adjustment when new ETA biomass data becomes available.
- By itself, the proposed closure of DMV in 2007, is expected to lower landings and increase prices and have slightly positive impacts on fleet revenues and negative impacts on total economic benefits in this year. Over the long-term (2008-2019), however, the economic benefits of the proposed closure are estimated to be slightly positive and exceed the benefits for other alternatives. On the other hand, closure of Delmarva could have some negative impacts on some Mid-Atlantic boats, because it leaves a small area in Mid-Atlantic for vessels to fish their open area DAS allocations. Opening of ETA in the same year is expected to mitigate these negative impacts.
- Proposed 20,000 open area DAS alternative is expected to have positive economic impacts by preventing overfishing in these areas and therefore, by preventing a decline in future landings, revenues, consumer and producer benefits from the scallop fishery.
- Eliminating the crew limit for controlled access areas could lower total fishing costs, increase total economic benefits. This measure could have negative economic impacts, however, if unlimited crew size leads to smaller scallops being landed, increasing fishing mortality, reducing price and future yield from the scallop resource.
- The impacts of the elimination of the trip exchange deadline, one to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel, one to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips authorized to be used in the 2006 fishing year and 60 day carry forward of compensation trips will have positive economic benefits on the scallop fishery by providing vessels the flexibility for vessel owners and fishermen to respond to existing conditions, to make better locational choices and to lower fishing costs as well as business and safety risks.

Summary of the aggregate impacts of the proposed measures

- Over the two year period from 2006 to 2007, the proposed measures, including Georges Bank, Hudson Canyon (HCA) and Elephant Trunk area rotation measures, Delmarva (DMV) closure and 20,000 open area DAS, are expected to have positive impacts on total scallop revenue, on producer and consumer surpluses and on total economic benefits. Average annual scallop landings during 2006-07 are estimated to increase to 74.8 million lb. with the proposed measures from an average of 70.8 million lb. for no action, and average ex-vessel price to decline from \$7.9 per pound for no action to \$7.4 per pound with the proposed measures. As a result, total scallop revenue will increase slightly by 1.06% (Table 101 in Section 5.2.1).
- Because total fishing costs are estimated to increase due to the allocation more access area trips with the proposed measures, producer surplus, as measured by the difference of total revenue and variable costs, will be increase minimally (by an average of 0.1% per year) over the two year period from 2006 to 2007. The increase in consumer benefits will be larger (5% per year) due to higher landings and lower scallop prices. Cumulative economic benefits, calculated as the sum of consumer and producer surpluses, are estimated to increase by \$30 million compared to the no action levels mostly due to the increase in consumer surplus (Table 139).
- The long-term (2008-2019) economic effects of the proposed measures are estimated to be slightly negative on revenues (an average 1.27% decline per year, Table 105) and negligible on producer surplus (0.1% decline per year). Since no action scenario results in higher price due to lower landings, revenues under this scenario would exceed the revenues for the proposed measures depending on the assumptions regarding changes in export, imports, disposable income, consumer preferences and composition of landings by market size category in the future years as discussed in Section 5.2.1. On the other hand, the decline in price and increase in scallop landings are expected to increase consumer benefits by 3% per year during the same period (Table 139). The cumulative value of total economic benefits is estimated to increase by \$103 million over the 12 years from 2008 to 2019 compared to no action (Table 139).

Table 139. Economic impacts of Framework 18 alternatives on producer, consumer and total benefits (in 1996 inflation adjusted prices)

Period	Alternatives (Scenarios)	Consumer Surplus		Producer Surplus		Total Economic Benefits		
		Total value (1996 Prices)	Average change per year %	Total value (1996 Prices)	Average change per year %	Total value (1996 Prices)	Change from no action (1996 Prices)	Average change per year %
Short-term: 2006-2007	No Action	\$272		\$731		\$1,002	\$0	
	Status Quo	\$301	5%	\$717	-0.9%	\$1,018	\$16	0.8%
	FW18 - 2 Yr HCA restriction	\$335	12%	\$717	-0.9%	\$1,052	\$50	2.5%
	FW18 - 24.7K open DAS	\$330	11%	\$720	-0.7%	\$1,050	\$48	2.4%
	FW18 - 15K open DAS	\$292	4%	\$721	-0.7%	\$1,013	\$10	0.5%
	FW18 - 20K open DAS	\$310	7%	\$724	-0.4%	\$1,034	\$32	1.6%
	FW18 - 30K open DAS	\$350	14%	\$712	-1.3%	\$1,062	\$60	3.0%
	DMV - 20K open DAS in 2006	\$338	12%	\$714	-1.2%	\$1,053	\$50	2.5%
	Proposed DMV - 20K open DAS in 2006-07	\$300	5%	\$732	0.1%	\$1,032	\$30	1.5%
	DMV - 18K open DAS in 2006-07	\$281	2%	\$737	0.5%	\$1,018	\$15	0.8%
Long-term: 2008-2019	No Action	\$665		\$4,590		\$5,255	\$0	
	Status Quo	\$833	2%	\$4,497	-0.2%	\$5,330	\$75	0.1%
	FW18 - 2 Yr HCA restriction	\$831	2%	\$4,504	-0.2%	\$5,336	\$81	0.1%
	FW18 - 24.7K open DAS	\$789	2%	\$4,516	-0.1%	\$5,305	\$50	0.1%
	FW18 - 15K open DAS	\$834	2%	\$4,501	-0.2%	\$5,335	\$80	0.1%
	FW18 - 20K open DAS	\$812	2%	\$4,508	-0.1%	\$5,320	\$65	0.1%
	FW18 - 30K open DAS	\$766	1%	\$4,523	-0.1%	\$5,289	\$35	0.1%
	DMV - 20K open DAS in 2006	\$829	2%	\$4,505	-0.2%	\$5,334	\$79	0.1%
	Proposed DMV - 20K open DAS in 2006-07	\$869	3%	\$4,489	-0.2%	\$5,358	\$103	0.2%
	DMV - 18K open DAS in 2006-07	\$886	3%	\$4,484	-0.2%	\$5,370	\$116	0.2%

- All alternatives allocate more DAS compared to no action during 2006 and 2007, therefore could increase employment measured by total crew days (Crew*DAS). Proposed elimination of 7-men crew limit for the controlled access areas could also lead to higher employment. On the other hand, with more crew, the vessels would also spend less DAS fishing in those areas. Therefore, the net impact of the proposed measures on employment would be positive if elimination of 7-men crew limit for controlled access areas does not reduce overall DAS.
- The individual measures proposed by this framework could have differential impacts on the productivity of the scallop industry, although these impacts are not expected to be significant. The estimated catch rates (LPUE) are slightly lower and costs are higher with the proposed area rotation measures compared to no action because proposed measures allocate more effort and result in higher scallop landings, having a minimal negative impact on productivity. The proposed elimination of crew limit in the controlled access areas, however, could increase the catch rates, lower fishing costs and improve the productivity of the industry if this measure does not lead to an increase in the catch of smaller scallops and overfishing in these areas. Other measures proposed by Framework 18, such as one to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips, of Georges Bank access trips and unused 2005 Hudson Canyon area trips, 60 day carry forward of compensation trips, early opening of ETA and

elimination of trip exchange deadline could also increase the productivity of the scallop industry and lower costs by providing vessels flexibility about when and where to fish.

- The benefits of the proposed measures may not necessarily be equally distributed among vessels and communities that participate in the scallop fishery. The individual measures proposed by Framework 18, including contingency schedule for Georges Bank access, closure of Delmarva and precautionary trip allocations for ETA, could have some distributional impacts on fishing families and communities, on scallop vessels depending on their size, and on processors and ports. The proximity of these entities to open and controlled access areas as well as to the areas closed for fishing because of rotation, bycatch reduction and/or habitat and turtle protection may result in differential impacts from Framework 18. One to one exchanges of 2006 Georges Bank access area trips and 2007 Elephant Trunk area trips with another vessel, one to one exchanges of Georges Bank access trips and unused 2005 Hudson Canyon area trips, 60 day carry forward of compensation trips and other measures such as early opening of ETA and elimination of trip exchange deadline could mitigate some of these impacts by providing vessels more flexibility in their fishing choices in terms of area and time. The distributional impacts of area-specific DAS allocations were discussed in relevant subsections of Section 5.2.2 and in Section 5.3, Social Impact Assessment, of Framework 18.
- The cumulative impacts of the measures from Framework 18 proposed measures, and the past actions including Amendment 10, Frameworks 16 and 17 to the scallop FMP, are estimated to be positive. Adjustment of the DAS allocations, implementation of trip limits 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. Although the actions proposed by Framework 18 will not have significant impacts on the fleet revenues, total economic benefits will be positive because of larger landings made possible with these measures compared to no action. As a result, cumulative economic benefits, which measure the sum of benefits from previous and proposed actions, are expected to be positive (See Table 132 for a summary of cumulative impacts).

6.13.3 Enforcement Costs

The enforcement costs and benefits of the proposed options for Framework 18 are within the range of impacts addressed in Section 8.9 of Amendment 10 FSEIS. The qualitative analysis included a comprehensive discussion of the pros and cons of the area rotation alternatives, alternatives for allocating effort, reducing bycatch and bycatch mortality, and alternatives for general category permits from an enforcement perspective. Section 8.9.5 of Amendment 10 also provided a description of the alternatives for improving data collection and monitoring, and discussed the implications of these in terms of the enforcement costs and benefits.

The proposed measures by Framework 18 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, the continuation of observer coverage program, trip exchanges and broken trip program (as modified by Framework 17). The proposed action include two new measures to liberalize the trip exchange program by providing one-to-one exchanges of 2006 GB access area trips and 2007 ETA trips and one-to-one exchanges of GB access trips and unused 2005 Hudson Canyon area trips to be used in 2006. Framework 18 also proposes to extend the broken trip program to include a 60-day carry forward provision to reduce business and safety risks with a reporting requirement. The Council did approve, however, an additional reporting requirement for broken trips as described in Section 3.1.11. The addition will enable NMFS to track original compensations trips and compensations trips for “Broken-Broken trips” and, therefore, will help enforcement in monitoring

access area trips. Although it is not possible to estimate accurately whether the proposed measures in this Framework will increase the enforcement requirements and administrative burden by changing the area rotation schedules for Georges Bank and Mid-Atlantic access areas, the monetary costs for the government may not appreciably change as long as the budgetary allocations for enforcement do not allow such an increase. Allocation of the existing resources to improve enforcement of new scallop regulations, however, may reduce the overall efficiency of enforcement for fishery regulations in general if such enforcement requires a reallocation of resources. On the other hand, since mechanisms and systems, such as VMS monitoring and data processing, are already in place to provide for satisfactory monitoring and enforcement of the proposed measures, the enforcement costs are not expected to change significantly from the levels necessary to enforce measures under the no action regulations.

6.13.4 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 18 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 Framework 18. The proposed measures will result in marginally positive impacts on scallop fleet revenue in the short-term and negligible negative impacts in the long-term. The impacts on total economic benefits will be positive both in the short-term (increase by \$30 million during 2006-2007) and over the long-term (increase by \$103 million over 2008-2019). Therefore, the proposed regulations may not have an annual impact on the economy of \$100 million or more. 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.

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 F_{max}. For a stock without a stock-recruitment relationship, like sea scallops, this stock biomass produces MSY when fished at F_{max}.

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 year⁴⁸.

F_{max} – a fishing mortality rate that under equilibrium conditions produces maximum yield-per-recruit. This parameter serves as a proxy for F_{msy} 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.

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.

⁴⁸ 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.

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. Its 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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