

8.0 Environmental Consequences – Analysis of Impacts

The analysis of impacts is described along disciplinary lines (biology, economics, sociology) rather than by alternative or issue. This allows description of the combined effects of related alternatives (e.g. Georges Bank area access, habitat closures, scallop area rotation management, day-at-sea allocations, ring-size) without excessive repetition if the analysis were structured by alternative. Where possible however, there is a general qualitative description of the effect of individual alternatives relative to its effect on scallop biology, habitat, fish bycatch, revenue and net benefits, and social variables and communities. Additionally, there is a qualitative assessment of the enforceability of various management measures included in the Amendment 10 alternatives. This assessment includes considerations of changes in enforcement costs as well as enforcement effectiveness and potential voluntary compliance.

In addition to the analyses along disciplinary lines, the environmental consequences sections that analyze potential effects on other fisheries and related species, through proposed management alternatives that could mitigate the effects of scallop fishing on habitat, bycatch and protected species. The biological effects of these alternatives are described separately below (Section 8.5), but are incorporated into the overall analysis of economic and social impacts in Sections 8.7 and 8.8, respectively.

8.1 Cumulative Effects Analysis

8.1.1 Scoping and Opportunity for Public Comments and Participation

During the development of Amendment 10, the Council held 127 days of meetings where Amendment 10 alternatives were a primary subject under discussion (Table 147). In these open meetings, the public was offered the opportunity to comment and provide advice on developing alternatives, reports, and presentations. Of the 127 meeting days, 54% were policy-setting meetings where the Council or its committees developed and approved alternatives. At all meetings, the public was invited to comment on nearly every motion made by committee members. Thirty-seven (37) percent were technical meetings, open to the public, where comment and advice on the developing analyses or analytical reviews was often accepted.

Finally, 9% of the meetings were public hearings on the amendment, related documents, and analyses where the public was invited to attend and comment on the alternatives and amendment documents. In addition there were two opportunities for the public to provide written comment, once during an initial phase of scoping when the Council was developing the goals, objectives, and issues that the amendment should address; and a second time during a 90-day comment period on the Draft Environmental Impact Statement (DSEIS). In addition, the Council also received extensive written comment during the development phase, in between the initial round of scoping and the public hearings on the DSEIS, in particular from the Fisheries Survival Fund (Dr. Kenchington and Mr. Frulla) and Oceana (Mr. Zeman). These comments were carefully considered and much public advice was used in developing management alternatives and selecting the final alternatives that the Council approved.

Many comments became the source of alternatives that the Council included in the draft amendment and analyzed in the DSEIS. In particular, the flexible boundary rotation area management strategy that the Council ultimately approved was derived from public input, as was the Working Group EFH model analysis (Habitat Alternative 5a – 5d) and a scallop-fishery specific approach that would have prohibited scallop fishing in areas that were marginal for scallop fishing or that had high essential fish habitat value. Other public comments led to the development of alternatives on a mandatory bag tag

system and an approach to simplify cooperative scallop research through the Experimental Fishing Permit process.

In some cases, strategies or approaches were recommended that the Council developed into alternatives using the expertise of its technical teams, in particular two of the habitat alternatives. Ultimately, the alternatives changed as more analysis was done and more data became available. In most cases, alternatives needed to be “fleshed out” to make them into workable solutions to the issues being addressed by the amendment. Sometimes the end result was unexpected and did not completely comport with the views of public members commenting on the developing alternatives.

In building alternatives and analyzing the potential impacts or results, the Council relied on several committees of technical experts. These experts included members of industry, academia, employees of federal or state marine resource management agencies, and employees of non-governmental organizations. These experts served as members of plan development and technical teams (Table 148), high-level technical review committees (Table 149), and advisory committees (Table 150).

Finally, the public input and expert advice culminated in the Council’s choice of final alternatives to submit with a Final Supplemental Environmental Impact Statement (FSEIS). In the final document, additional analyses were provided to address deficiencies identified by the public during the 90-day DSEIS comment period and to provide better estimates of the impacts of the final alternative as a whole on valuable environmental components (VECs) that are expected to be effected by the proposed action.

Table 147. Summary of meeting days in which the public was able to provide input and comment on Amendment 10 alternatives.

Meetings	2000	2001	2002	2003	Total
Council	3	5	4	4	16
Scallop Oversight Committee	7	10	6	4	27
Scallop Advisory Committee	1	1	2	1	5
Scallop Jt O/S & Advisory Committee	4	0	1	0	5
Joint Sc & Hab O/S & Adv Meeting	1	0	0	0	1
Joint Sc & Gear Conflict Meeting	1	0	0	0	1
Joint Sc & Enforcement Meeting	1	0	0	0	1
Habitat Oversight Committee	0	1	4	2	7
Habitat Advisory Committee	0	0	0	0	0
Habitat O/S & Adv Committee	3	0	0	0	3
Enforcement Working Group	0	0	1	0	1
Adv Panel Rep Workshop	0	0	0	2	2
Scientific and Statistical Committee	0	0	2	0	2
Social Sciences Advisory Committee	0	1	1	0	2
Scallop Plan Development Team	9	9	9	2	29
Scallop Joint PDT & ADV Committee	0	2	0	0	2
Habitat Technical Team	5	3	2	1	11
Habitat Tech Team & Adv	0	0	0	1	1
Scallop scoping	3	0	0	0	3
EFH scoping	0	1	0	0	1
Scallop public hearing on DSEIS	0	0	0	7	7
Policy meetings	21	17	18	13	69

<i>Meetings</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>Total</i>
Scientific and technical meetings	14	15	14	4	47
Public hearings	3	1	0	7	11

Table 148. Plan Development Team and Habitat Technical Team members that performed analyses, contributed material to the document, and/or provided critical review of scientific advice and analysis.

Scallop PDT		Habitat Technical Team	
Member	Affiliation	Member	Affiliation
Mr. Pete Christopher	NMFS	Mr. Lou Chiarella	NMFS
Dr. William DuPaul	VA Institute of Marine Science	Dr. David Stevenson	NMFS
Dr. Dvora Hart	NEFSC	Dr. Steve Edwards	NOAA/NMFS/NEFSC
CDR Greg Hitchens	First Coast Guard District	Dr. David Packer	NOAA/NMFS
Dr. Paul Rago	NEFSC	Dr. Jason Link	NOAA/NEFSC
Dr. Stanley Wang	NOAA/NMFS	Dr. Page Valentine	U.S. Geological Survey
Mr. Andrew Applegate (Chair)	NEFMC	Mr. Mark Lazzari	Dept. of Marine Resources
Dr. Demet Haksever	NEFMC	Mr. Joe Pelczarski	MA Coastal Zone Management
Dr. Keven Stokesbury	UMASS SMAST, New Bedford, MA	Mr. Thomas Moth-Poulsen	MA Division of Marine Fisheries
Dr. Steve Edwards	NEFSC	Mr. Vincent Malkoski	MA Division of Marine Fisheries
Mr. Steve Correia	MA Division of Marine Fisheries	Dr. Jeremy Collie	URI
Dr. Kevin St. Martin	Rutgers University	Dr. Peter Auster	Univ. of Connecticut
Mr. Tom Hoff	MAFMC	Mr. Robert Reid	NEFSC
Dr. Jim Kirkley	VA Institute of Marine Science	Ms. Leslie-Ann McGee (Chair)	NEFMC
		Mrs. Deirdre Boelke	NEFMC

Table 149. NEFMC technical review committee members that provided critical review of scientific advice and analysis.

Science and Statistical Committee		Social Sciences Advisory Committee	
Member	Affiliation	Member	Affiliation
Dr. Vaughn Anthony	NMFS, Retired	Dr. James M. Acheson	University of Maine
Dr. Victor Crecco	Connecticut Division of Marine Fisheries	Dr. Priscilla Brooks	Conservation Law Foundation
Dr. John Hoenig (Scallop liaison)	VA Institute of Marine Science	Dr. Christopher Dyer	School for Field Studies
Dr. Francis Juanes	UMASS Amherst	Dr. John M. Gates	URI
Dr. Guy Marchesseault, Ph.D	WASTECH International	Dr. Daniel Georgianna	UMASS Dartmouth
Dr. Jean-Jacques Maguire	DFO, Canada	Dr. David Terkla	UMASS Boston
Dr. Andrew Rosenberg	UNH	Dr. Ralph Townsend	University of Maine
Dr. Brian Rothschild	UMASS Dartmouth	Dr. Madeleine Hall-Arber	MIT Sea Grant College
Dr. Saul Saila	URI	Dr. Ilene M. Kaplan	Union College
Dr. Patrick Sullivan	Cornell University	Dr. Seth Macinko	Univ. of Connecticut
Dr. Desmond Kahn	State of Delaware	Dr. Robert Robertson	UNH
Dr. Alexei Sharov	Maryland Dept. of Natural Resources	Dr. Kevin St. Martin	Rutgers University
Dr. Patrick Sullivan	Cornell University	Dr. Jon G. Sutinen	URI

Science and Statistical Committee		Social Sciences Advisory Committee	
Member	Affiliation	Member	Affiliation
		Dr. Robert Muth	UMASS Amherst

Table 150. Advisory committee members that provided expert advice and recommendations to the Council.

Scallop Advisors		Habitat Advisors	
Member	Affiliation	Member	Affiliation
Barbara Bragdon	Dennisport, MA	Dr. Peter J. Auster	Groton, CT
Herman R. Bruce	Dartmouth, MA	Dr. Anthony Chatwin	Boston, MA
Daniel Cohen	Cape May, NJ	Benjamin Cowie-Haskell	Scituate, MA
Hans Davidsen	Acushnet, MA	Edward Cunnie	Narragansett, RI
Ronald Enoksen	New Bedford, MA	Clifford A. Goudey	Cambridge, MA
James Fletcher	Manns Harbor, NC	Wm. Hubbard	Rye, NH
Gary Hatch	Owls Head, ME	Dr. Les Kaufman	Boston, MA
Kirk Larson (Chair)	Barnegat Light, NJ	David Lincoln	Gloucester, MA
Frank McLaughlin	Yorktown, VA	Maggie Mooney-Seus	Gloucester, MA
William F. Peabody	Carrollton, VA	Paul Parker	No. Chatham, MA
Mark Shackelford	Hampton, VA	Maggie Raymond	So. Berwick, ME
Raymond Starvish	Fairhaven, MA	Dr. Frederick Short	Lee, NH
Richard Taylor	Gloucester, MA	Ronald Smolowitz (Chair)	E. Falmouth, MA
William Wells (Vice-chair)	Yorktown, VA	Willis Spear	Yarmouth, ME
Chris Zeman	River Vale, NJ	Richard Taylor	Gloucester, MA
John Fernandez III	Newport News, VA	Dr. Peter J. Auster	Groton, CT
Sheryl Harper	Southwest Harbor, ME		
Howard Nickerson	New Bedford, MA		
Barbara Bragdon	Dennisport, MA		

8.1.2 Boundaries

The geographical area encompassed by the proposed action and managed by this FMP include the seawater and seabottom of the Atlantic Ocean within US jurisdiction and includes the vessels participating in the fishery, the ports where scallop vessels tie-up, and the shore-side facilities to the point of landing. The point of landing is typically the location where a shore-side individual or entity takes possession of the catch for processing and re-sale. Most of the scallop population under US jurisdiction ranges from the coastline of Maine, south to Georges Bank, then from offshore of Long Island, NY running south and southwest to off the coast of North Carolina in the Mid-Atlantic region. Adult scallops are found in depths ranging from a few meters in the north, to 20 to 40 fathoms through most of the range, and sometimes much deeper although scallops in deeper areas have low meat yields and may not contribute to spawning activity as much as other scallops. Scallop larvae exist in the water column from the bottom to the surface layers and drift with prevailing currents, throughout the NW Atlantic Coastal Shelf.

8.1.3 Sources of Impacts (Pathways)

Most of the environmental impacts that are regulated by this FMP arise from the act of fishing for sea scallops. Impacts occur because fishing gear makes contact with and disturbs the sea bed environment, because the scallop fishing gear selectively removes various species from the environment (some of which are discarded as unwanted or regulatory bycatch), and because the retain catch is landed at coastal ports which generates revenue and economic activity. Environmental impacts on scallops, scallop larvae, and scallop habitat through activities that degrade water quality, suspend sediments in the water column, and change circulation.

8.1.4 Time series

Various time series of impacts apply, depending on the context of analysis and evaluation. The FMP has existed since 1982, which is also when the modern annual scallop survey began. The scallop fishery, however, began in the late 1800's in the Gulf of Maine, and expanded to the South Channel area off Cape Cod, MA in the early 1900's, and then expanded throughout the range in the 1960's and 1970's. Although resource surveys using different gear configurations and vessels began in the late 1950s, most of the information before 1982 was derived from reported landings.

More pro-active management and data collected began in 1994, with implementation of Amendment 4 to the FMP. This action implemented limited access, vessel monitoring systems that recorded fishing activity and locations, and vessel trip reports. Although sampling was sparse for the sea scallop fishery, the Sea Sampling Observer Program began in 1992. Collection and analysis of VMS data became better over time and many of the impact analyses that use scallop fishing distribution as an input use 1998 – 2000 VMS data that was available for analysis in this document.

8.1.5 Valuable Environmental Components (VEC)

The following concerns represent valuable environmental components that the Sea Scallop FMP and Amendment 10 affect. Practically, the act of scallop fishing changes their condition or character or derive a benefit from the vessel activity and/or landings. For some VECs, more fishing would cause a decline in biomass or abundance of the VEC. For other VECs, their condition improves with greater sustainable landings. Others experience change depending on how and where scallop fishing effort occurs, or the complexity of the rules governing scallop fishing.

8.1.5.1 Sea Scallop Resource under US jurisdiction

This includes all scallop larvae in the water column and juvenile and adult scallops that settle and grow on the seabed.

8.1.5.2 Scallop fishing fleet and infrastructure (suppliers, maintenance facilities, processors)

This includes all vessels with limited access and general category scallop permits, the dealers that buy and process sea scallops from the vessels, and primary suppliers to the vessels that sell them gear, engines, boats, etc.

8.1.5.3 Vulnerable Finfish Resources Caught as Bycatch in the Scallop Fishery

This includes all regulated species that fishermen catch in scallop dredges and trawls, except for sea scallops. Fish and shellfish other than scallops that are landed are not bycatch and are not included. Species that are frequently included as bycatch are discarded individuals of monkfish, yellowtail flounder, and various species of skates (including barndoor).

8.1.5.4 Essential Fish Habitat (EFH) for Finfish, Scallops, and Shellfish Under Federal Management

This includes all marine habitats deemed essential to the well-being and reproduction of managed marine species. The geographical distribution and characteristics of EFH are defined in the management plans that regulate the fisheries targeting marine species.

8.1.5.5 Protected Species

This VEC includes marine mammal and turtle species that are classified as endangered or threatened under the Endangered Species Act and which have interactions with scallop fishing gear or are otherwise affected by scallop fishing.

8.1.5.6 Human Safety at Sea

This includes the health and well-being of captains, crew, and other individuals while aboard at-sea scallop vessels.

8.1.5.7 Fishing Dependent Communities

This includes coastal communities with fishing ports, whose economies and social structure are substantially dependent on or affected by scallop fishing activity and income.

8.1.5.8 Marine Fisheries Law Enforcement and Administration

This includes USCG and NMFS Law Enforcement resources that are assigned to enforcing and administering scallop fishery regulations and programs.

8.1.6 Mitigation and Monitoring

No mitigation is needed because the proposed action is expected to reduce adverse impacts on the environment. Monitoring of the scallop resource, fishing activity and catches, bycatch, and interactions with protected species is needed to ensure the FMP meets its objectives, produces optimum yield, and identifies ways to enhance yield (through rotation closures and mortality control) and minimize impacts.

8.1.7 Interactions among environmental effects and significance of cumulative effects of past, proposed, and reasonably foreseeable future actions

The following tables summarize the direct, indirect, and cumulative effects of past management measures, proposed management measures and reasonably foreseeable future effects on the environment, classified by valuable economic components (VECs). To keep this analysis in context of the FMP, the effects related to the current and proposed management alternatives are listed. No change or neutral effect means that the expected cumulative, direct, or indirect effects are expected to be no different than they had been under past and present actions. Not applicable means that the relevant action did not exist in the past or present, or it will not apply in the future under a reasonably foreseeable future action. An unknown or none identified designation means that the Council is unable to foresee an action that would

have an effect, but one might exist in the future. An uncertain effect means that a past, present, proposed, or future action is certain to have an effect, but the Council cannot determine whether the effect will be positive, neutral, or negative.

Past activities include fisheries, fisheries management, and non-fishing activities that occurred since Amendment 4 implementation in 1994. Proposed activities include the final alternatives in Amendment 10. Reasonably foreseeable future actions include probable or potential federal activities and permitted activities that occur within the boundaries of this analysis. Examples include management of fisheries by other plans (particularly the management by the Northeast Multispecies FMP of fisheries that adversely effect groundfish EFH); management measures needed to reduce interactions and protect sea turtles; sediment disposal, dredging, and seabed drilling; and windfarms.

Table 151. Summary of cumulative effects: **VEC = Sea Scallop Resource under US jurisdiction.** Impacts on the scallop resource generally occur through changes in the fishing mortality rate and the fishery’s size selection. Generally management measures that reduce mortality or select larger scallops benefit the scallop resource.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.2, 8.1.1, and 8.2	Past ad hoc rotation management has allowed higher biomass levels, while maximizing yield and (although uncertain) potentially improving recruitment.	Increases potential to keep biomass around Bmsy and increases yield from the fishery. Reduces mortality on small scallops through closure, having a positive conservative effect.	Uncertain effects which depend on implementation of future management actions. Actions in other plans that limit access under area rotation rules could mitigate the positive effect of rotation area management. Projection indicated that most strategies will be beneficial.	Very positive cumulative effect when combined with 4” rings and area-specific DAS allocations.
Georges Bank area access	Sections 7.2, 8.1.1, and 8.2	Georges Bank area access has been positive for the scallop resource, by reducing fishing mortality on scallops in open fishing areas.	Similar positive effects are anticipated.	Rules that minimize bycatch and habitat impacts may have a negative effect if they force fishing effort onto smaller scallops in other places.	Area access will have positive cumulative effects by maintaining high biomass in the groundfish closed areas, with periodic access.
Hudson Canyon Area controlled access	Sections 7.2, 8.1.1, and 8.2	Also positive for the scallop resource, but the effects have been less certain because fishing effort hasn’t risen to desired targets.	Positive effects similar to the Georges Bank area access are anticipated.	Conversion to a fully-open status may occur at a different time than 2006 under a future framework action, also having a positive effect.	Hudson Canyon Area access has been and will continue to benefit the resource.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Significant positive effect through reductions in mortality where scallops are smaller and increases in mortality where they are larger.	Same as proposed action.	When combined with the status quo overfishing definition target mortality, the DAS allocations may continue allowing effort to exceed MSY levels in open fishing areas, unless future action is taken.
One-to-one controlled access area trip exchanges	Sections 7.2, 8.1.1, and 8.2	Not applicable.	No appreciable effect.	No effect.	None identified.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Broken trip exemptions (DAS adjustments)	Sections 7.2, 8.1.1, and 8.2	Negative effect because existing rules have discouraged fishing in controlled access areas.	Positive effect anticipated, because it reduces the business risk of losing controlled access area DAS allocations during a broken trip.	Same as proposed action.	Could have a positive cumulative effect by allowing the FMP to meet area-specific mortality targets and maximize sustainable yield.
Carry over DAS	Sections 7.2, 8.1.1, and 8.2	No effect observed.	No effect expected.	Same as proposed action.	None identified.
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Positive, because it allows better control of fishing effort to prevent exceeding fishing mortality thresholds.	Positive effect, because measure prevents uncontrolled increases in fishing mortality if rules in other fisheries become more restrictive or scallop prices rise.	Positive cumulative effect.
Management of general category fishery (status quo option)	Sections 7.2, 8.1.1, and 8.2	Possible negative effect on inshore scallop resources.	No change.	Negative impacts if rules in other fisheries become more restrictive or scallop prices rise.	Uncontrolled fishing effort could have a negative cumulative impact.
Status quo overfishing definition	Sections 7.2, 8.1.1, and 8.2	Effects have been both positive and negative. Effort reductions to achieve the fishing mortality targets has promoted stock rebuilding, but fishing mortality targets that incorporate permanently closed areas allow too much fishing effort in fully-open fishing areas, particularly in the Mid-Atlantic region.	No change.	Future framework actions that define different mortality targets or DAS allocations have the potential to keep biomass near the target.	Mixed, but problems are projected for the Mid-Atlantic scallop resource unless future action is taken.
4" minimum ring size	Sections 7.2, 8.1.1, and 8.2	The increase to 3½" rings has been very positive for the resource.	Projected to increase biomass and yield, therefore positive.	Same as proposed action.	Positive cumulative effects are anticipated, especially when combined with area rotation and area-specific DAS allocations.
10" minimum twine top	Sections 7.2, 8.1.1, and 8.2	Twine top mesh size has had little effect on the scallop resource.	No effect anticipated.	Same as proposed action.	No cumulative effect on the scallop resource anticipated.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Habitat closure alternative 6	Sections 7.2, 8.1.1, and 8.2	Mixed effects: overlapping Georges Bank closed areas have allowed for rapid scallop stock rebuilding, but have prevented the benefits from translating into yield.	Similar effects as before Amendment 10, but may promote access to less sensitive parts of the Georges Bank closed areas.	Actions in other plans may limit bottom tending mobile gear, promoting habitat restoration.	Reduces fishing effort in areas with above average numbers of EFH designations and in areas containing sensitive and complex bottom habitats, having a positive effect.
TAC/DAS set-asides for habitat research	Sections 7.2, 8.1.1, and 8.2	Not applicable.	No effect.	No effect.	None identified.
TAC/DAS set-asides for scallop research	Sections 7.2, 8.1.1, and 8.2	Positive effects because it has funded research to map and measure scallops densities to support ad hoc area rotation and Amendment 10.	Continuation of benefits expected to occur through suitable rotation area management.	Funds may increase and allow data collection on a larger scale.	Positive cumulative effects are anticipated.
TAC/DAS set-asides to increase sea sampling	Sections 7.2, 8.1.1, and 8.2	No measurable effect on VEC.	No effect anticipated.	Same as proposed action.	Neutral cumulative effect.
Proactive protected species framework	Sections 7.2, 8.1.1, and 8.2	Same as above.	Same as above.	Same as above.	Neutral cumulative effect.
Revised bi-annual framework adjustment procedure	Sections 7.2, 8.1.1, and 8.2	Framework adjustments have allowed the FMP to respond to changing resource conditions.	Framework adjustment procedure will allow active management through area rotation and DAS allocations.	Same as proposed action.	Positive cumulate effect.
Other Alternatives					
New overfishing definition	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Positive effect that keeps mortality near appropriate levels for regional resource conditions.	Same as proposed action	Particularly with area rotation and habitat closures, positive cumulative effects through better control of fishing mortality.
Other habitat closed area alternatives	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Maintains high biomass and reproduction, but may not maximize yield.	Developing habitat alternatives in other FMPs may provide more conservation for scallops overall, but lead to declining yield from the resource.	May be overly conservative for the scallop resource when combined with existing closures.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Area specific possession limits for finfish	Sections 7.2, 8.1.1, and 8.2	Some benefits may have occurred by discouraging fishing in portions of controlled access areas having high bycatch.	No change.	No change.	Small positive cumulative effect.
Long-term closures with high bycatch	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Could provide more conservation for the scallop resource, but lead to declining yield.	Same as proposed action.	May be overly conservative for the scallop resource when combined with existing closures.
Incidental catch and general category permits	Sections 7.2, 8.1.1, and 8.2	Not applicable.	Possible positive effect by allowing for better control of scallop fishing mortality.	Same as proposed action.	Could have positive cumulative effect, particularly for inshore scallop resources.
Restriction on rock chains	Sections 7.2, 8.1.1, and 8.2	Not applicable.	No appreciable effect anticipated.	Same as proposed action.	None identified.
No action/Status quo	Sections 7.2, 8.1.1, and 8.2	When combined with above average recruitment and closures, status quo management has promoted stock rebuilding.	Expected to cause declines in scallop biomass when scallop recruitment returns to average levels and promotes a rapid decline in open area biomass and catches if scallop recruitment becomes below normal.	Would require more access to closed areas to keep landings up – a long term negative.	Generally, status quo could increase fishing mortality and fishing effort if scallop recruitment declines, having cumulative effects on the scallop resource and other VECs.
Other federal activities having potential VEC effects	Sections 7.2 and 8.1.1	No effects have been noted, except for possible isolated events.	Not applicable.	Other fisheries using bottom tending mobile gear may cause non-catch mortality or discard mortality, having a negative effect. Proposed windfarm locations appear to have no impact, unless they occur on offshore banks or along coastal Maine. Seabed pipeline construction that passes through scallop habitat could have a negative effect on the scallop resource if disturb sediments are not contained.	Cumulative effects can be negative for activities that degrade water quality or increase sedimentation in offshore areas.

Table 152. Summary of cumulative effects: **VEC = Scallop fishing fleet and infrastructure (suppliers, maintenance facilities, processors).** Fishery impacts generally occur through the amount of revenue derived from fishing and the costs of fishing. Generally management measures that improve yield or reduce fishing costs have positive effects on the fishing industry.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.1, 8.7, and 8.8	Ad hoc rotation has been a positive effect on the fishing industry, although management difficulties have created business uncertainty.	Positive effect to fleet due to higher landings and to consumers due to lower prices. Total economic effect from area rotation is at least 3 - 7 % increase in net benefits.	Actions in other FMPs that hinder scallop access and rotation management could reduce benefits.	Area rotation will reduce fishing effort and mortality on smaller scallops, helping to maintain biomass and spawning activity at target levels, which will have positive effect on the VEC.
Georges Bank area access	Sections 7.1, 8.7, and 8.8	Results have been mixed because while access has had positive effects, some portions of the areas have remained closed and continued access has been difficult to achieve.	Effects are expected to be positive through a more permanent identification of access areas and a plan for regular mechanical rotation.	Actions in other FMPs could change how much of the scallop resource in the Georges Bank closed areas is accessible, having either positive or negative effects.	Access has had and will have positive effects by reducing bycatch and habitat impacts, while increasing optimum yield. Efficiency increases for fishing in the closed areas during a mechanical rotation program. Inability to access the areas means that scallops do not contribute to yield and eventually biomass declines from natural mortality or catastrophic loss from predation and/or infections.
Hudson Canyon Area controlled access	Sections 7.1, 8.7, and 8.8	Effects have largely been positive by delaying mortality on small scallops during 1998-2000. Benefits have accrued through upslope scallop movement and by controlled access fishing during 2001-2003, both making larger scallops available.	Controlled access in 2004 – 2005 is expected to have positive benefits through higher landings of large scallops.	Positive effect, because the FMP will re-evaluate by framework action whether controlled access should continue in 2006, or the Hudson Canyon Area should revert to a regular, open fishing area.	Ad hoc rotation of the Hudson Canyon Area is probably the most successful result of ad hoc area rotation, because the fleet has been able to fish in the area after scallops reach optimum size.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.1, 8.7, and 8.8	DAS tradeoffs have had positive effects by shifting effort away from and reducing mortality in regular, open fishing areas. Some vessels however have not used the days to fish in controlled access areas, mitigating the expected positive effect.	Greater benefits are expected because controlled access area DAS allocations cannot be used in regular, open fishing areas. Some negative distributional effects are anticipated for less mobile fishing vessels.	Changes in biomass levels may be required to adjust the DAS tradeoff. DAS may fluctuate due to changes in scallop abundance and size frequency.	The DAS allocations and tradeoff have had a positive effect by controlling fishing mortality, which will be enhanced by area-specific allocations, resulting in optimum yield for specific areas.
One-to-one controlled access area trip exchanges	Sections 7.1, 8.7, and 8.8	Not applicable.	Positive effect expected because it allows fishing industry flexibility to fish in preferred locations, potentially reducing fishing costs.	Other federal actions that limit where scallop vessels may fish could reduce positive effects.	Positive effects are anticipated because it allows the scallop fleet to reduce costs while still deriving the benefits of area-specific DAS allocations.
Broken trip exemptions (DAS adjustments)	Sections 7.1, 8.7, and 8.8	The existing program has generally had negative effects by curbing fishing in controlled access areas.	New system is expected to address existing problems and encourage fishing in appropriate locations. Positive effects are therefore expected.	None expected.	Combined with area-specific DAS allocations and controlled access, it will have positive effects.
Carry over DAS	Sections 7.1, 8.7, and 8.8	Positive effects by allowing more flexibility, potentially reducing fishing costs.	Continued positive effects are expected.	None expected.	Same as above.
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.1, 8.7, and 8.8	Not applicable.	Positive effects for the industry as a whole, but negative effects on some vessels that augment scallop income by fishing off the clock.	Possible positive effect by allowing more future limited access DAS allocations than if this practice were continued..	Although this could have a positive effect on the VEC, it could have a negative cumulative effect by encouraging more fishing for other species.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Management of general category fishery (status quo option)	Sections 7.1, 8.7, and 8.8	Positive effect realized by giving smaller vessels an option to fish on a rebuild resource, however local effects on scallop yield from inshore scallop populations have been negative.	No change.	More restrictive management in other FMPs or higher scallop prices could lead to more scallop fishing. On one hand, this has a positive effect by providing options to small vessels in other fisheries. On the other hand, it could reduce optimum yield from inshore scallop populations.	Helps to supply local scallop markets in small ports.
Status quo overfishing definition	Sections 7.1, 8.7, and 8.8	Fishing mortality reductions to meet existing biological reference point goals have promoted rebuilding and boosted income and economic activity.	In the short term, it allows the FMP to allocate at least 120 DAS to scallop vessels, allowing them to continue to be profitable. In the long-term, producer surplus is expected to decline if the overfishing definition allows DAS allocations to increase when fewer scallops are available.	DAS adjustments will be needed to match scallop productivity. The revised framework adjustment process sets optimum yield as a specific goal to be achieved which may have positive effects.	Cumulative effects on VEC have been very positive and will be positive in the short term, but it may allow too much effort in some areas, unless the FMP sets lower mortality targets and DAS allocations by framework adjustment. Effort allocations are not negatively effected by large area closures for habitat or other conservation objectives, which have a short-term positive effect, but may have long-term negative implications.
4" minimum ring size	Sections 7.1, 8.7, and 8.8	Increasing ring size to 3½ inches has been very positive, because it has increased small scallop escapement and boosted yield-per-recruit.	Similar positive effects are anticipated as long as areas having large scallops are open to fishing. Operating costs are expected to decline because the dredge will be more efficient. A short-term cost will accrue as suppliers and the industry switch gear.	None expected.	Effects are expected to be very positive when combined with rotation area management, which focuses fishing effort on large scallops.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
10" minimum twine top	Sections 7.1, 8.7, and 8.8	Other than the cost of the gear, the effects have been neutral, because the larger mesh has been deployed in areas with large scallops that are retained by the mesh.	Since the scallop resource has rebuilt and larger scallops are available, neutral effects are anticipated other than the short term costs to the fleet and suppliers for changing gear.	Habitat or groundfish closures that encompass areas having large scallops will have a negative effect by shifting effort into areas with small scallops that will not be retained by the larger mesh.	Area rotation promotes fishing on larger scallops and would therefore prevent negative effects that might occur by using large twine tops where small scallops exist.
Habitat closure alternative 6	Sections 7.1, 8.7, and 8.8	Similar closures associated with groundfish closed areas have had negative effects by preventing fishing on valuable scallop resources.	Preventing access to valuable scallop resources within the area will have negative effects on the VEC.	Different habitat closure alternatives in the Multispecies FMP may allow more access, having positive effects. Habitat closures in other plans that conflict could cause larger closures than intended.	Although long-term closures have a negative effect on the scallop industry, the habitat closure as a means to minimize habitat impacts helps to justify more regular access to and fishing effort in other areas.
TAC/DAS set-asides for habitat research	Sections 7.1, 8.7, and 8.8	Not applicable.	Slight negative effect by reducing the portion of OY available to the fleet. Neutral effect on processors and suppliers.	None expected.	Uncertain.
TAC/DAS set-asides for scallop research	Sections 7.1, 8.7, and 8.8	Positive effect from applying results of scallop research to present management.	Same as before, but Amendment 10 will make more funds available, increasing beneficial scallop research.	None expected.	Positive by improving management and increasing OY.
TAC/DAS set-asides to increase sea sampling	Sections 7.1, 8.7, and 8.8	Positive effect, because it has allowed access to areas where bycatch monitoring is important.	Slight negative effect by reducing the portion of OY available to the fleet. Neutral effect on processors and suppliers.	Changes in allowable catches of finfish could require more observers and increase the need for funding through higher set-asides.	Long-term benefits will outweigh the costs, having a positive effect.
Proactive protected species framework	Sections 7.1, 8.7, and 8.8	Not applicable.	No effect at the present time.	Possible actions may restrict scallop fishing to reduce turtle encounters or changes in fishing gear may be required, both having negative impacts.	Could have positive effect by allowing scallop fishing to continue by addressing issues with less costly methods.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Revised bi-annual framework adjustment procedure	Sections 7.1, 8.7, and 8.8	Framework adjustments have had a positive impact by allowing the FMP to respond to changing conditions.	Revised procedure will allow the FMP to adjust and could reduce business uncertainty and risk.	None expected.	Positive effects because framework adjustments will allow the FMP to achieve OY.
Other Alternatives					
New overfishing definition	Sections 7.1, 8.7, and 8.8	Not applicable.	Short term negative effect, because DAS reductions would be applied. Long-term positive effect by maximizing yield and reducing fishing costs.	Not applicable.	Large area closures that overlap scallop fishing areas could cause drastic reductions in DAS allocations, having a very negative effect in the short-term.
Other habitat closed area alternatives	Sections 7.1, 8.7, and 8.8	Not applicable.	Mostly negative effect unless it allows access to groundfish areas that are now closed or expected to be closed.	Habitat closures in other plans that conflict could cause larger closures than intended.	Could cause problems with ability to manage area rotation.
Area specific possession limits for finfish (not adopted, but available as a frameworkable measure)	Sections 7.1, 8.7, and 8.8	Possible positive effect by keeping controlled access areas open when finfish bycatch may have reached a TAC and close areas to fishing.	May have similar positive effect, depending on implementation by framework action.	Limits imposed by other FMPs could reduce income.	Positive cumulative effect when appropriately applied to reduce the risk of closing areas when finfish TACs are met.
Long-term closures with high bycatch	Sections 7.1, 8.7, and 8.8	Not applicable.	Year-round closures would have had a substantial negative effect. Seasonal closures would have had a slightly negative effect.	Unknown.	Increases in groundfish and monkfish stock biomass could cause localized increases in bycatch because catches exceed finfish possession limits.
Incidental catch and general category permits	Sections 7.1, 8.7, and 8.8	Positive effect for small vessels and local infrastructure. Slight negative effect on limited access vessels and associated businesses because it raises fishing mortality.	Possible positive effect by achieving a higher sustainable yield from inshore scallop populations.	Would have been successful of limiting impacts from more restrictive management actions in other FMPs or increases in scallop price.	Positive effect from effective control of fishing mortality on scallops that general category vessels typically target.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Restriction on rock chains	Sections 7.1, 8.7, and 8.8	Rock chains have had a positive effect on the VEC by improving safety and making more of the scallop resource accessible to fishing.	Potentially negative effect on VEC, because it could increase fishing costs and reduce accessibility of scallops to the fleet.	Requirements for rock chains to reduce turtle interactions, if it becomes necessary may cause conflicts.	Negative impacts are anticipated from reducing the ability to use rock chains.
No action/Status quo	Sections 7.1, 8.7, and 8.8	Existing management has had positive effects on the scallop industry.	Negative impacts are expected, because the policies are no longer suitable given the condition of the scallop resource.	Complicated framework actions would be required to avert negative impacts of no action.	Although positive effects have occurred because the scallop resources have rebuilt, negative cumulative effects are anticipated if fishing effort were not adjusted to respond to current conditions.
Other federal activities having potential VEC effects	Sections 7.1 and 7.2	Groundfish closures have had a very negative effect due to not achieving OY.	Not applicable.	Windfarms may negatively affect the ability for scallop vessels to use Nantucket Sound to transit from Georges Bank scallop areas to New Bedford and other MA ports. Ocean disposal, dredging, and other sea bed activities near scallop populations could reduce growth and recruitment or increase mortality and have a negative effect on OY and scallop revenue. Area closures to address protected species issues or protect manmade seabed structures could similarly have a negative effect.	Cumulatively, actions that adversely affect scallop productivity or make scallops inaccessible to fishing have a negative effect.

Table 153. Summary of cumulative effects: **VEC = Vulnerable Finfish Resources Caught as Bycatch in the Scallop Fishery.** Bycatch impacts generally occur through the selectivity of the fishery, where fishing occurs relative to the distribution of finfish species, and when fishing occurs. Generally management measures that reduce the overlap between the target fishery and species that are vulnerable to capture during scallop fishing have positive effects on bycatch.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.2.4 and 8.3	Ad hoc area rotation and access has been beneficial for most species. Catches may increase for some species concentrated in re-opened areas.	Expected to be beneficial for most species due to decreases in fishing time per DAS and per unit of scallop landings.	The “Elephant Trunk” area in the Mid-Atlantic region will reopen in 2008 and have similar effects as the Hudson Canyon Area controlled access program.	Combined with 4” rings and 10” twine tops, rotation management area is expected to reduce fishing time and minimize finfish bycatch.
Georges Bank area access	Sections 7.2.4 and 8.3	Beneficial for most species. Catches of most finfish species were low. Barndoor skate catches may have increased but were a very low fraction of total biomass.	Amendment 10 projects substantial decreases of fishing time in the groundfish closed areas and is therefore beneficial.	Framework Alternative 39 will implement additional measures to minimize impacts on groundfish.	Minimal impacts on groundfish stock biomass and rebuilding
Hudson Canyon Area controlled access	Sections 7.2.4 and 8.3	Beneficial for most species.	Continued benefits for most species.	Hudson Canyon Area will open fully to scallop fishing in 2006, but this is unlikely to have a negative effect for most species.	Effort could increase in the Hudson Canyon Area with area-specific DAS allocations, reducing total fishing time in the Mid-Atlantic.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.2.4 and 8.3	Not applicable.	Could have positive impacts for many species due to effect on minimizing fishing time.	Same as proposed action.	Measure helps to focus fishing activity where it is most efficient. Very positive when combined with 4” rings and 10” twine tops.
One-to-one controlled access area trip exchanges	Sections 7.2.4 and 8.3	Not applicable.	Neutral effect.	Neutral effect.	Neutral effect.
Broken trip exemptions (DAS adjustments)	Sections 7.2.4 and 8.3	Has had negative impacts on VEC because effort was mis-applied in regular, open areas.	Positive effect because it encourages DAS use in controlled access areas where full-time per DAS is low.	Same as proposed action.	Positive when combined with area rotation, 4” rings, and 10” twine tops.
Carry over DAS	Sections 7.2.4 and 8.3	Neutral effect.	Neutral effect.	Same as proposed action.	Neutral effect.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.2.4 and 8.3	Unquantified, but possible negative effect by encouraging nearshore fishing in New England.	Positive effect because it reduces fishing effort outside of the limited access DAS program.	Positive effect because a greater amount of fishing will occur under limited access rules.	Difficult to quantify.
Management of general category fishery (status quo option)	Sections 7.2.4 and 8.3	Same as above.	Unquantified, but possible negative effect by encouraging nearshore fishing in New England.	Same as proposed action.	Requiring 4" rings and 10" twine tops will have positive benefits.
Status quo overfishing definition	Sections 7.2.4 and 8.3	Negative. It encouraged overexploitation of scallops in open fishing areas and reduced scallop catch rates.	Negative. Effort in open fishing areas will be higher than that needed to produce maximum yield.	Possibly positive or neutral if the Council chooses lower mortality targets in future framework actions.	Depends on how the area-specific DAS allocations are set under future framework adjustments.
4" minimum ring size	Sections 7.2.4 and 8.3	Increases from 3" to 3 ½ " rings may have had positive, but unmeasurable effects.	Expected to have positive impacts by reducing fishing time in areas having larger scallops. Gear comparison research shows substantial benefits for most finfish.	Same as proposed action.	Expected to have positive impacts when combined with area rotation, where fishing effort will focus on larger scallops, minimizing scallop loss through the rings.
10" minimum twine top	Sections 7.2.4 and 8.3	Increases from 6" to 8" in open areas and to 10" in controlled access areas had positive, although difficult to measure, impacts.	May have positive impacts, depending on the distribution of fishing.	Same as proposed action.	Expected to have positive impacts when combined with area rotation, where fishing effort will focus on larger scallops, minimizing scallop loss through the twine top.
Habitat closure alternative 6	Sections 7.2.4 and 8.3	Similar to groundfish area closures. Mixed benefits due to effort shifts.	Beneficial effects for some species that concentrate in the closed area.	Same as proposed action.	When combined with status quo overfishing definition, may have negative effects for species concentrated in other areas.
TAC/DAS set-asides for habitat research	Sections 7.2.4 and 8.3	Not applicable.	No measurable effect.	Same as proposed action	No measurable effect.
TAC/DAS set-asides for scallop research	Sections 7.2.4 and 8.3	Assisted research on more selective gear modifications.	No measurable effect and program will not increase finfish bycatch compared to normal commercial scallop fishing.	May be beneficial if research identifies more selective gear or methods of fishing to minimize bycatch or bycatch mortality.	Unknown.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
TAC/DAS set-asides to increase sea sampling	Sections 7.2.4 and 8.3	Improved ability to quantify bycatch and their effects.	Expanded program will provide more complete picture. Program will not increase finfish bycatch compared to normal commercial scallop fishing.	May identify bycatch “hotspots” for future framework actions to address, therefore beneficial.	Unknown.
Proactive protected species framework	Sections 7.2.4 and 8.3	Not applicable.	No effect.	Depending on the types of management measures needed to reduce interactions, it could increase finfish bycatch.	Combined with status quo overfishing definition mortality targets, closures to reduce interactions would have negative effect on finfish bycatch.
Revised bi-annual framework adjustment procedure	Sections 7.2.4 and 8.3	Past framework actions have provided more opportunity to address bycatch issues, therefore have been positive.	Effect no different than past actions.	Same as proposed action. Goal to achieve optimum yield may have a positive effect, depending on future mortality targets and management measures established by framework.	Administration of rotation area management by framework could have positive or negative impacts, depending on fishing mortality targets and area-specific DAS allocation amounts.
Other Alternatives					
Alternative overfishing definition	Sections 7.2.4 and 8.3	Not applicable.	Positive effect due to effects of maximizing yield from the available resource with much less fishing time and area swept.	Same as proposed action	Positive effect because of interactions with area-specific DAS allocations, crew limits, 4” rings, and 10” twine tops.
Other habitat closed area alternatives	Sections 7.2.4 and 8.3	Not applicable.	Cannot be measured due to lack of data.	Unknown.	Larger closures could have negative impacts when combined with the status quo overfishing definition.
Area specific possession limits for finfish	Sections 7.2.4 and 8.3	Has had positive effects by inducing vessels to fish in areas where catches are less for species they cannot keep.	Depends on future implementation by framework action.	May be applied in controlled access areas to modify fishing behavior to avoid catches that cannot be retained and for which a hard TAC is applied.	Could be positive when combined with controlled access area management.
Long-term closures with high bycatch	Sections 7.2.4 and 8.3	Not applicable.	Positive effect by closing areas with statistically high bycatch levels.	Not applicable.	Could have had a positive effect when coupled with the alternative overfishing definition.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Incidental catch and general category permits	Sections 7.2.4 and 8.3	Unmeasurable. Finfish bycatch may be high in coastal New England areas.	Finfish bycatch may be high in coastal New England areas.	Same as proposed action	Enhanced sea sampling may be available to characterize bycatch.
Restriction on rock chains	Sections 7.2.4 and 8.3	Not applicable.	Continuation of rock chain use has unknown impacts. May have negative impacts by allowing fishing activity in sensitive and complex habitats where small fish are more abundant.	Same as proposed action.	Unknown.
No action/Status quo	Sections 7.2.4 and 8.3	Finfish catches have substantially declined from larger rings, larger twine top mesh, lower DAS allocations and less fishing time per DAS.	Not applicable.	Not applicable.	Continued overexploitation of scallops in open fishing areas are predicted to reverse gains made in recent years due to stock rebuilding.
Other federal activities having potential VEC effects	Assessed in other FMPs.	Georges Bank area closures may have helped reduce impacts, but the closures increase fishing pressure in other areas with groundfish.	Not applicable.	Habitat closures in other plans may have important impacts on finfish bycatch in the scallop fishery, due to effort shifts.	Unknown.

Table 154. Summary of cumulative effects: **VEC = Essential Fish Habitat (EFH)**. EFH impacts generally occur through contact with the seabed by bottom tending gear that removes, disturbs, or buries benthic epifauna. The quality and quantity of adverse impacts are related to the amount and distribution of fishing activity, as well as the type of gear in use. Generally management measures that reduce fishing time, focus fishing in less sensitive areas, or modify gear so that it has less contact with the bottom have positive effects on EFH.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.2.6, 8.1.9, and 8.5	Past ad hoc rotation management (through access programs) has allowed higher biomass levels, while maximizing yield and (although uncertain) potentially improving recruitment. Since effort and bottom contact time are expected to be lower under RAM, EFH may benefit under this type of management strategy. Therefore, there have been some positive impacts on EFH from controlled access programs implemented in the past, which are similar to RAM.	Specific impacts of area rotation will vary depending on the type and vulnerability of habitat types present in the area, its size, the intensity of scallop fishing prior to closure, recovery times for critical habitat features, etc., but overall, RAM is expected to have positive effects because effort on gravelly sand sediment types is expected to decline. However, negative impacts may also occur because more effort is expected to shift to areas with more EFH for juvenile species with vulnerable EFH. Therefore, there may be both positive and negative cumulative impacts on EFH from RAM..	According to the analysis, effort under a rotational area management strategy in the long-term has a bias toward areas having more than 6 EFH designations for species with vulnerable EFH. Therefore, there may be negative cumulative impacts on EFH from RAM as an overall strategy, but normal scallop fishing may have a negative cumulative impact on EFH as well. Other FMPs: There is potential for negative cumulative effects on rotation area management if areas are closed to scallop fishing in other plans. For example, if mortality closures or habitat closures are implemented through Amendment 13 to the Multispecies FMP, that could benefit EFH, but reduce the effectiveness of RAM if the boundaries do not overlap and cause area swept to increase in open areas, which would have negative impacts on EFH.	The distribution of sediment types and EFH associated with projected scallop fishing effort within rotational management varies depending on which RMAs are open, and which are closed. The long-term projections suggest that scallop effort may be shifted toward areas with EFH vulnerable to bottom tending gear, however previous actions similar to RAM (access programs) have decreased area swept, so there may be some positive impacts on EFH. Overall, RAM will have cumulative impacts on EFH; positive on areas outside access areas, and negative for the EFH within RAMs.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Georges Bank area access	Sections 7.2.6, 8.1.9, and 8.5	These areas were closed to groundfish gear (including scallop dredges) in 1995 and opened to scallop dredging on a limited basis in 1999 and 2000. Therefore, some of the habitat benefits accrued in these areas over time has been reduced. Permitting some access into the Georges Bank areas may reduce habitat benefits in those areas, but it may also improve habitats in areas outside by reducing bottom contact time. Opening them to scallop dredging will have a direct negative effect on the EFH within the closures, particularly in Closed Area I because hard bottom habitat in this area is more vulnerable to fishing than sandy bottom in other areas.	No change from past actions.	Under rotation area management, it is likely that areas on Georges Bank will be part of the rotational strategy in order to harvest MSY. Thus, it is probable that these areas will be subject to fishing activity in the short and long term. Thus the positive and negative impacts on EFH described in the past actions column still apply. Other Plans: It is possible that Amendment 13 may implement additional mortality or habitat closures in this area. That would likely benefit the EFH within the access program, but displace scallop effort in other areas, which could have negative impacts on EFH in the overall region.	Cumulative effects of Georges Bank access over time are thus neutral, both positive and negative. Access to Georges Bank has localized negative impacts on EFH, but overall access programs have reduced bottom contact time and may have reduced fishing effort in areas with “sensitive” habitat in areas outside access programs, which would benefit EFH.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Hudson Canyon Area controlled access	Sections 7.2.6, 8.1.9, and 8.5	Permitting some access into the Hudson Canyon area may improve habitats in areas outside by reducing bottom contact time, and since the habitats in the Hudson Canyon area are not considered “sensitive”, there have been positive cumulative impacts on EFH from this controlled access program. Short-term closures do not provide significant habitat benefits, but there may be additional EFH benefits from the DAS tradeoffs.	No change from past actions.	It is possible that the Hudson Canyon area could reopen as an uncontrolled area in the future. It is likely that the negative impacts on EFH and small scallops would increase in that area if the control access program expires. Continued access will be reevaluated in future actions. Other Plans: There are no RFFAs that would have an impact on the Hudson Canyon access program that the Council is aware of that would impact EFH.	While there may be some direct negative impacts to the EFH in the HC closure by providing access to the scallop fleet, the substrate in that area is not considered to be as “sensitive” as areas outside the closure. There have been indirect beneficial impacts on the EFH in areas outside the HC closure as a result of the access program. Overall, cumulative impacts are positive because effort has shifted onto less “sensitive” bottom as a result of the access program, and bottom contact time has declined.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.2.6, 8.1.9, and 8.5	Negative impacts on EFH in the past because vessels have used DAS in areas where bottom contact time increases, potentially having negative impacts on EFH.	As a stand-alone measure, this should decrease bottom contact time by preventing vessels from using DAS in an area that is inappropriate.	Same as proposed action. Other Plans: There are no RFFAs that would have an impact on area specific DAS and trip applications that the Council is aware of that would impact EFH.	Positive cumulative impact on EFH from this measure, if bottom contact time is reduced and vessels are shifted into areas that are more appropriate/efficient for harvesting scallops.
One-to-one controlled access area trip exchanges	Sections 7.2.6, 8.1.9, and 8.5	No predictable effect on EFH.	No predictable effect on EFH.	None identified.	Cumulative effects on EFH are uncertain.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Broken trip exemptions (DAS adjustments)	Sections 7.2.6, 8.1.9, and 8.5	It is probable that fishing time in open areas has increased under past management due to this measure because there is a reduced incentive to fish in controlled areas since there is risk of losing DAS if a vessel has to return to port early. This measure may have prevented more vessels from participating in controlled access programs., thus increasing effort in outside areas having negative impacts on EFH.	The proposed change to the broken trip exemption will hopefully reduce the risk for vessels to participate in access programs. Thus more effort will be shifted into access areas, where bottom contact time is lower, potentially having some indirect benefit to EFH in outside areas.	Same as proposed action. Other Plans: There are no RFFAs that would have an impact broken trip exemptions that the Council is aware of that would impact EFH.	Potentially, this measure will increase the number of vessels that participate in access programs. Overall, the measure has neutral cumulative impacts on EFH, but if significantly more vessels participate in access programs as a result of this adjustment for broken trips, then the EFH in outside areas may benefit.
Carry over DAS	Sections 7.2.6, 8.1.9, and 8.5	No expected impact.	No expected impact.	Same as proposed action. Other Plans: There are no RFFAs that would have an impact on carry over days that the Council is aware of that would impact EFH.	No expected impact.
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.2.6, 8.1.9, and 8.5	Not Applicable because limited access vessels have been able to fish under general category rules in the past.	The impacts of this action on EFH are uncertain. It is possible that limited access vessels will do something else to replace this lost scallop revenue, but specifically what cannot be predicted.	Other Plans: If vessels want to replace lost income and fish in other fisheries, but other FMPs have restrictions that prevent them from shifting effort, then the effects on EFH may be positive because those limited access scallop vessels will not be fishing.	Overall the cumulative impacts of this action are difficult to predict because shift is effort are dependent on whether vessels will try to replace potential lost income. Cumulative impacts on EFH are uncertain.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Management of general category fishery (status quo option)	Sections 7.2.6, 8.1.9, and 8.5	General category vessels primarily fish inshore and in areas with complex bottom. Thus this fishery has had negative impacts on EFH, but so have other fisheries in the region.	Amendment 10 proposes to allow general category vessels to fish in newly reopened areas, which it did not before, so that will increase effort, an indirect negative impact on EFH.	<p>Prices of scallops could impact the amount of general category activity. Increased prices could increase effort, that would have potentially negative impacts on EFH. Or prices could go down, thus less effort, so benefits for EFH. Other FMPs:</p> <p>It is possible that as a result of restrictions implemented in Amendment 13, vessels with general category permits will shift to scallop fishing from groundfish fishing to replace lost income. This will have a neutral impact on EFH because those vessels were fishing already.</p>	This measure will potentially increase fishing effort in certain areas that are now accessible to general category vessels, thus the cumulative impacts are potentially negative for EFH. It is important to note that the incremental effect on EFH from the general category vessels may be negligible given much higher effort by limited access vessels. Therefore, the overall cumulative impacts from this measure may be slightly negative, compared to the level of other fishing activities in the region.
Status quo overfishing definition	Sections 7.2.6, 8.1.9, and 8.5	Effort has declined significantly under the Amendment 7 (status quo) overfishing definition. Since Amendment 4, effort levels have decreased; thus, there have been positive impacts on EFH with lower effort levels.	In the short-term, there is no change to effort levels and impacts on EFH from this overfishing definition, but in the long-term; this overfishing definition will have negative impacts on EFH because effort will increase over time.	Council may set lower targets and DAS in a future framework to prevent increased effort under the status quo definition that could reduce effort, which would then have indirect positive impacts on EFH. Otherwise, effort is expected to increase in the future under this definition, which could mean negative impacts on EFH.	Cumulatively, this overfishing definition has neutral impacts because effort reductions in the past have had positive impacts on EFH, but projections indicate that effort will increase as a result of this overfishing definition, so habitat impacts in the future may be negative unless future action is taken.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
4" minimum ring size	Sections 7.2.6, 8.1.9, and 8.5	The size of rings has changed in the past from 3 inches to 3.25 etc. This has aided stock rebuilding, and as a result bottom contact time has declined having positive impacts on EFH.	Four inch rings will slightly increase dredge efficiency for larger scallops, thus reducing bottom contact time in recently opened areas where large scallops are abundant, a positive impact on EFH. But four inch rings will reduce catch rates and increase bottom time in areas where medium-small sized scallops are prevalent, thus having a negative impact on EFH.	None identified.	Increasing ring size in the past has had positive impacts on EFH because it has aided recruitment, and allowed the fishery to harvest larger scallops, thus reducing bottom contact time. However, if 4 inch rings cause bottom contact time to increase because of high levels of escapement, then EFH will be negatively impacted. The cumulative impacts of this action on EFH are uncertain and are dependent on the recruitment levels of scallops.
10" minimum twine top	Sections 7.2.6, 8.1.9, and 8.5	None	Ten-inch twine tops will reduce by-catch, but have no direct habitat effects.	None identified.	No cumulative impacts on EFH from this measure.
Habitat closure alternative 6	Sections 7.2.6, 8.1.9, and 8.5	The cod HAPC is the only habitat closed area in this region (implemented under the Multispecies FMP). While it is difficult to measure, there are most likely habitat benefits from this area, as well as the long-term, large mortality closed areas on Georges Bank and in the Gulf of Maine.	The areas within Alternative 6 have been closed since 1994, so keeping these areas closed will improve habitat recovery and most likely have EFH benefits for the EFH within these areas.	Amendment 13 to the Multispecies FMP has identified two habitat closed area alternatives as preferred alternatives (Alternatives 10a and 10b in A13). If these areas are added to the habitat closure implemented in Amendment 10, EFH will benefit as a result. It is also possible that these areas could replace Alternative 6 in a subsequent framework, which would still benefit EFH in the region.	Overall, long-term closed areas are expected to have a cumulative benefit on EFH. If the areas outside closures are more "sensitive" however, then benefits on EFH for the entire region will be lower because effort will be displaced onto more "sensitive" areas.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
TAC/DAS set-asides for habitat research	Sections 7.2.6, 8.1.9, and 8.5	Not Applicable	Could indirectly benefit habitat when habitat research is funded and provides better information for future management decisions	Future research projects funded by this TAC set-aside could help identify better ways to minimize impacts on EFH.	Overall this measure will have indirect benefits on EFH. However, the actual scientific research will most likely have negative impacts on EFH when gear used in the research will come into contact with the bottom. These negative impacts are very small in comparison to normal fishing activity and will probably be outweighed by the indirect positive impacts on EFH from the results of the research.
TAC/DAS set-asides for scallop research	Sections 7.2.6, 8.1.9, and 8.5	Not Applicable	Could indirectly benefit habitat when scallop research is funded and provides better information for future management decisions.		Overall this measure could have indirect positive impacts on EFH if the research focuses on habitat as well, but the benefits will be less than research specifically designed for habitat purposes (see above).
TAC/DAS set-asides to increase sea sampling	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	No effect	No Effect	No effect

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Proactive protected species framework	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	No effect	Closed areas in the Mid-Atlantic region for protected species may shift effort to Georges Bank and the Gulf of Maine-which are made up of more complex bottom-an indirect negative impact on EFH.	The cumulative impacts of this action on EFH depends on the specific action that is taken, but if it includes closed areas that will shift effort into more “sensitive” areas there could be negative impacts on EFH. In addition, if effort is shifted into areas that are less efficient for harvesting scallops, then bottom contact time could increase, causing a negative impact on EFH.
Revised bi-annual framework adjustment procedure	Sections 7.2.6, 8.1.9, and 8.5	Uncertain impact	No habitat effects; Council can take action under a framework action to protect EFH.	Uncertain impact	Uncertain impact
Other Alternatives					
Alternative overfishing definition	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	This overfishing definition would decrease bottom contact time, thus having positive impacts on EFH.	None	Cumulative effects of this measure on EFH would be positive, because fishing time would be less.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Other habitat closed area alternatives	Sections 7.2.6, 8.1.9, and 8.5	The cod HAPC is the only habitat closed area in this region (implemented under the Multispecies FMP). While it is difficult to measure, there are most likely habitat benefits from this area, as well as the long-term, large mortality closed areas on Georges Bank and in the Gulf of Maine.	There is a diverse group of closed area alternatives designed to minimize impacts on EFH in Amendment 10 (11 total). The EFH benefits vary for each alternative, but each one would increase the amount of ocean floor closed for fishing for the long-term, a direct benefit on EFH.	Almost all of these alternatives are also being considered in Amendment 13, and could include prohibitions on scallop dredge gear. Amendment 13 also contains additional closed area alternatives that are not in Amendment 10 that have been identified as preferred alternatives (Alternatives 10a and 10b in A13). If these areas are added to the habitat closure implemented in Amendment 10, EFH will benefit as a result. It is also possible that these areas could replace Alternative 6 in a subsequent framework, which would still benefit EFH in the region.	Overall, long-term closed areas are expected to have a cumulative benefit on EFH unless effort is displaced to more vulnerable EFH, outweighing the benefits of the closure. The specific level of benefit to EFH varies between the eleven closed area alternatives under consideration.
Area specific possession limits for finfish	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	Uncertain impacts	Uncertain impacts	Uncertain impacts
Long-term closures with high bycatch	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	If closures are implemented, then it can be assumed that the EFH for those species with high bycatch will benefit as a result of the closure.	None	There could be cumulative benefits to the EFH of species with high levels of bycatch if closures are implemented, assuming that the areas with high levels of bycatch are also areas that have been designated as EFH for those species.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Incidental catch and general category permits	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	Could impact the level of effort, but the impacts on EFH are uncertain.	None	One requirement under this measure is VMS for general category vessels. There may be some indirect cumulative benefits to EFH if all general category vessels are required to have VMS.
Restriction on rock chains	Sections 7.2.6, 8.1.9, and 8.5	Not applicable	This measure could reduce effort in hard and complex bottom areas which would benefit EFH, or this measure could increase impacts on EFH because gear will no longer “roll-over” complex substrate, it will remove or displace it.	None	Cumulative impacts from this measure are uncertain.
No action/Status quo	Sections 7.2.6, 8.1.9, and 8.5	As compared to past actions such as Amendment 4 and Amendment 7, the NA/SQ alternative would have positive impacts on EFH. However, not as positive as compared to more recent fishing years and management actions.	The No Action alternative would have positive impacts on EFH because it cuts DAS significantly. The status quo alternative would have negative impacts on EFH because it proposes to increase DAS and area swept projections increase.	The measures proposed in Amendment 10 will impact the No Action and Status Quo alternative in terms of EFH impacts. Specific measures will be in place to minimize the impacts on EFH, most notably habitat closed area alternative 6.	Overall, scallop fishing has a negative impact on EFH. Cumulatively, past and present management actions have reduced some of those impacts; for example through DAS reductions, closed areas and gear restrictions.

Final Alternative	Analysis of Direct and Indirect Impacts on EFH	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Other federal activities having potential VEC effects	Section 7.2.6	<p>There are many actions that have had negative impacts on EFH over time, many not under NMFS jurisdiction. For example, coastal development, marine pollution, dumping, and offshore oil and gas exploration.</p> <p>There have also been many actions that have had positive impacts on EFH, especially from restrictions within FMPs. Long-term closed areas in the region have had cumulative benefits on EFH- specifically the groundfish closed areas and the Stellwagen Bank Marine Sanctuary. Other FMPs have reduced effort, which has beneficial impacts on EFH. Furthermore gear restrictions have been implemented in the past, and have had positive impacts on EFH.</p>	Not applicable	<p>It is possible that future actions will continue to have both negative and positive impacts on EFH. Some projects being proposed in the region that could have negative impacts on EFH are windfarms, offshore pipelines, potential leasing for sand and gravel mining, and offshore dumping.</p> <p>The Council is not aware of any FMP actions that will increase the negative impacts on EFH, that do not also have measures within the plan to minimize those negative impacts.</p>	Over time, there have been many actions that have had negative impacts on EFH. More recently, steps have been taken to minimize those impacts, which will have cumulative benefits on EFH.

Table 155. Summary of cumulative effects: **VEC = Protected Species.** Protected species impacts generally occur because of where fishing occurs relative to the distribution of protected species, and when fishing occurs. Generally management measures that reduce the overlap between the target fishery and protected species have positive effects.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.2.7 and 8.3.1	No effects due to area closures	Impacts vary, depending on what areas remain open and the area-specific DAS allocations	Re-opening the Hudson Canyon Area to regular scallop fishing in 2006 may cause impacts if opened when turtles are present.	Scallop fishery may have an effect on some species of sea turtles if interactions exceed potential biological removals (PBRs).
Georges Bank area access	Sections 7.2.7 and 8.3.1	Positive effect from effort shifts from the Mid-Atlantic region.	Same positive effects can be anticipated.	Limits due to bycatch and habitat concerns may restrict access, although area access during the late-summer and early-fall will be positive to divert effort from the Mid-Atlantic.	Generally positive, because of lower fishing time and effort shifts from areas with turtles.
Hudson Canyon Area controlled access	Sections 7.2.7 and 8.3.1	Unknown effects, although interactions have been higher than anticipated. Some interactions may be related to fishing intensity and fishing activities in the Hudson Canyon Area.	No change expected.	Protected species rules may change fishing methods or seasons, having a positive effect.	Generally positive for sea turtles, because fishing time per DAS is lower for Hudson Canyon Area trips.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.2.7 and 8.3.1	Not applicable.	Positive effects because it will reduce fishing effort in the Mid-Atlantic region, particularly in areas where sea turtles are usually present.	Same as proposed action.	DAS limits have been generally positive, because they limit fishing effort.
One-to-one controlled access area trip exchanges	Sections 7.2.7 and 8.3.1	Not applicable.	No effect expected.	No effects expected.	None identified.
Broken trip exemptions (DAS adjustments)	Sections 7.2.7 and 8.3.1	May have been negative, because it discouraged fishing in the controlled access areas and increased fishing effort elsewhere.	Positive effect because it encourages fishing in the controlled access areas, which reduces total fishing time.	Same as proposed action.	None identified.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Carry over DAS	Sections 7.2.7 and 8.3.1	No effect observed.	No change.	No change.	No cumulative effect identified.
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.2.7 and 8.3.1	Takes in the general category scallop fishery are unknown.	Uncertain effects.	Uncertain effects.	No cumulative effect identified.
Management of general category fishery (status quo option)	Sections 7.2.7 and 8.3.1	Same as above.	Same as above.	Same as above.	Same as above.
Status quo overfishing definition	Sections 7.2.7 and 8.3.1	May be negative due to the high level of DAS use and fishing time in open areas in the Mid-Atlantic region.	No change in effect.	Future framework adjustment could set lower fishing mortality targets and/or area-specific DAS allocations, reducing DAS use and fishing time in the Mid-Atlantic region, where turtle catches are higher.	Habitat or bycatch area closures in the Georges Bank region and possibly the Gulf of Maine may force more scallop fishing effort into the Mid-Atlantic region, where turtle catches are higher unless future action is taken.
4" minimum ring size	Sections 7.2.7 and 8.3.1	Ring size does not appear to be a factor in determining the rate of sea turtle interactions.	No change in effect. Gear comparison research in the Mid-Atlantic does not show a difference related to ring size.	No change.	None identified.
10" minimum twine top	Sections 7.2.7 and 8.3.1	Uncertain, but no increases in interaction were reported when increasing mesh size from 6 to 8". Turtle catches in the Hudson Canyon Area do not appear to be related to 10" twine top mesh.	Uncertain, but no change in effect is expected.	Protected species monitoring by observers will be able to detect a change.	No apparent cumulative effect related to mesh size.
Habitat closure alternative 6	Sections 7.2.7 and 8.3.1	Not applicable.	No effect by itself.	Other habitat closure alternative under evaluation may increase impacts if they close areas with more scallop biomass.	Has a negative effect on sea turtles when combined with the status quo overfishing definition. This would allocate more DAS in open areas, which the fishery in open areas often focuses on the Mid-Atlantic region.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
TAC/DAS set-asides for habitat research	Sections 7.2.7 and 8.3.1	Not applicable.	No effect.	No effect.	None identified.
TAC/DAS set-asides for scallop research	Sections 7.2.7 and 8.3.1	Positive. Research has been conducted to identify ways to avoid or reduce turtle interactions.	Potentially positive, if TAC/DAS set aside funds are used for research to evaluate gear modification that reduce sea turtle interactions.	Future management changes may include gear modifications identified by research that have minimal impacts on other VECs.	None identified.
TAC/DAS set-asides to increase sea sampling	Sections 7.2.7 and 8.3.1	Positive. Controlled access areas observer programs, funded by scallop set-asides, have identified problems that were thought to be minimal.	Expansion of set-aside to include regular, open fishing areas will help identify the distributions and distinguish conditions that cause more frequent sea turtle interactions.	Causes of interactions identified by sea sampling data may be used in future management adjustments to minimize interactions.	Identification of the problem is the first step in a solution.
Proactive protected species framework	Sections 7.2.7 and 8.3.1	Not applicable.	No effect at present.	Potential to expedite management actions to address protected species issues.	Potentially positive.
Revised bi-annual framework adjustment procedure	Sections 7.2.7 and 8.3.1	No effect.	No effect.	No effect.	None identified.
Other Alternatives					
New overfishing definition	Sections 7.2.7 and 8.3.1	Not applicable.	Positive through effort reductions, particularly in the Mid-Atlantic region where sea turtle interactions are higher.	Not applicable.	Would be beneficial overall by reducing fishing time, but could lead to fishing method changes which have uncertain effects.
Other habitat closed area alternatives	Sections 7.2.7 and 8.3.1	Not applicable.	No effect.	No effect.	Combined with the status quo overfishing definition, alternatives with greater overlap with scallop biomass could increase fishing effort elsewhere, particularly in the Mid-Atlantic region.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Area specific possession limits for finfish	Sections 7.2.7 and 8.3.1	No effect.	No effect.	No effect.	No cumulative effect, unless finfish discards attracts turtles to areas intensively fished under area rotation rules.
Long-term closures with high bycatch	Sections 7.2.7 and 8.3.1	Not applicable.	Most areas identified are in the Georges Bank region and Southern New England, where few sea turtle interactions have been observed.	Same as proposed action.	Combined with the status quo overfishing definition, alternatives with greater overlap with scallop biomass could increase fishing effort elsewhere, particularly in the Mid-Atlantic region.
Incidental catch and general category permits	Sections 7.2.7 and 8.3.1	Unknown.	Unknown.	Unknown.	None identified.
Restriction on rock chains	Sections 7.2.7 and 8.3.1	Not applicable.	May cause increases or conflict with a possible solution to reduce turtle interactions.	May have a negative effect if rock chains turn out to be a viable solution to reducing Mid-Atlantic turtle interactions.	Potentially negative cumulative effect if the use of rock chains is limited.
No action/Status quo	Sections 7.2.7 and 8.3.1	Possible negative impact because of high fishing effort levels in the Mid-Atlantic region.	No change.	No change.	Possible negative impact because of high fishing effort levels in the Mid-Atlantic region.
Other federal activities having potential VEC effects	Assessed in Biological Opinions for Protected Species	Georges Bank closed areas caused an effort shift into the Mid-Atlantic region, having a potentially negative impact.	No cumulative or interactive effect known.	Alternatives that prevent scallop fishing on the Georges Bank stock could have a negative imp act.	Area closures in the Georges Bank region and possibly in the Gulf of Maine could have a negative cumulative effect.

Table 156. Summary of cumulative effects: **VEC = Human Safety at Sea.** Safety is affected by how and when the fishery operates and any regulatory limits that affect it. Generally management measures that allow flexibility for fishermen to determine where and when to fish have positive effects on safety.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 6.1.10 and 7.1.1	Ad hoc area rotation has caused few impacts on the VEC. Rules for transiting closed scallop rotation areas have been modified to reduce impacts.	No change.	Increases in rotation area management closures could increase impacts from transiting and forcing vessel to fish in unsuitable or unfamiliar areas.	Area rotation guidelines mitigate impacts by distributing closed rotation management areas across the region and by limiting the amount of area closed at one time.
Georges Bank area access	Sections 6.1.10 and 7.1.1	No effect.	No change.	Same as proposed action.	Area-specific DAS allocations may force vessels to fish in areas where the vessel is ill-suited and the crew is unfamiliar. Trip exchanges mitigates this concern.
Hudson Canyon Area controlled access	Sections 6.1.10 and 7.1.1	No effect.	No change.	Same as proposed action.	See above.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 6.1.10 and 7.1.1	Not applicable.	Area-specific DAS allocations may force vessels to fish in areas where the vessel is ill-suited and the crew is unfamiliar	Same as proposed action.	Trip exchanges mitigates impacts.
One-to-one controlled access area trip exchanges	Sections 6.1.10 and 7.1.1	Not applicable.	Positive impact because vessels will be allowed to fish in familiar and suitable areas.	May be negative, because suitable and familiar areas may be unavailable in some years.	None identified.
Broken trip exemptions (DAS adjustments)	Sections 6.1.10 and 7.1.1	Negative impact due to existing rules forcing vessels to remain in controlled access areas to avoid losing days, despite adverse conditions.	Will reduce negative impacts because of automatic adjustment procedure allows vessel to make more rational choice to terminate a trip early due to adverse conditions.	No foreseeable actions would impact the positive effect of the new rules.	Changes in scallop prices may change the value of the two DAS penalty.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Carry over DAS	Sections 6.1.10 and 7.1.1	Positive impact because vessels are not forced to fish under adverse conditions at the end of the year.	No change.	No foreseeable actions would impact the positive effect of this rule.	Vessels may change their plan to use or carry over DAS due to regulations in other fisheries, changes in scallop price,
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 6.1.10 and 7.1.1	No effect, other than those related to the amount of fishing time.	No effect, other than those related to the amount of fishing time.	No foreseeable actions would impact the positive effect of this rule.	None identified.
Management of general category fishery (status quo option)	Sections 6.1.10 and 7.1.1	Same as above.	Same as above.	Same as above.	None identified.
Status quo overfishing definition	Sections 6.1.10 and 7.1.1	Same as above.	Same as above.	Same as above.	None identified.
4" minimum ring size	Sections 6.1.10 and 7.1.1	No safety issues have been identified from increasing the ring size from 3 to 3½"	No safety issues have been identified from gear comparisons using 4" rings.	Same as proposed action.	None identified.
10" minimum twine top	Sections 6.1.10 and 7.1.1	No safety issues have been identified from increasing the mesh size from 6 to 8"	No change expected.	Same as proposed action.	None identified.
Habitat closure alternative 6	Sections 6.1.10 and 7.1.1	Slight negative impacts associated with gear stowage rules for transiting closed areas.	No change expected, especially since boundaries coincide with existing closed area boundaries.	Changes in habitat closures under other plans may increase transiting.	OSHA rules may make transiting more difficult, if they apply to commercial fishermen.
TAC/DAS set-asides for habitat research	Sections 6.1.10 and 7.1.1	Not applicable.	No effect.	No effect.	None identified.
TAC/DAS set-asides for scallop research	Sections 6.1.10 and 7.1.1	Not applicable.	No effect.	No effect.	None identified.
TAC/DAS set-asides to increase sea sampling	Sections 6.1.10 and 7.1.1	No effect has been observed.	No change.	Same as proposed action.	If required to carry observers, some vessels may have to improve vessel conditions related to safety.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Proactive protected species framework	Sections 6.1.10 and 7.1.1	Not applicable.	No effect.	Future rules could cause impacts on safety.	None identified.
Revised bi-annual framework adjustment procedure	Sections 6.1.10 and 7.1.1	Not applicable.	No effect.	Unknown.	Unknown.
Other Alternatives					
New overfishing definition	Sections 6.1.10 and 7.1.1	No effect, other than those related to the amount of fishing time.	No effect, other than those related to the amount of fishing time.	No foreseeable actions would impact the positive effect of this rule.	None identified.
Other habitat closed area alternatives	Sections 6.1.10 and 7.1.1	Not applicable.	Possibly negative. Changes in habitat closures under other plans may increase transiting under gear stowage rules.	Same as proposed action.	Multiple gear stowage requirements may cause safety issues to increase.
Area specific possession limits for finfish	Sections 6.1.10 and 7.1.1	No effect observed.	No change.	Unknown.	Unknown.
Long-term closures with high bycatch	Sections 6.1.10 and 7.1.1	Not applicable.	Possibly negative. Changes in habitat closures under other plans may increase transiting under gear stowage rules.	Same as proposed action.	Multiple gear stowage requirements may cause safety issues to increase.
Incidental catch and general category permits	Sections 6.1.10 and 7.1.1	No safety issues other than those normally associated with fishing have been observed.	No change.	Same as proposed action.	Unknown.
Restriction on rock chains	Sections 6.1.10 and 7.1.1	Positive. Rock chains are thought to promote safety by deflecting large rocks that would be otherwise caught in the dredge.	Negative. Removing rock chains could increase crew injuries by requiring removal of more and larger rocks from dredges at sea.	Protected species management may require rock chains to reduce turtle interactions.	Habitat alternatives in other FMPs could reduce interactions with rocks due to closures of areas with complex bottom habitats.
No action/Status quo	Sections 6.1.10 and 7.1.1	General downward trend in casualties possibly related to DAS reductions and safety programs for commercial fishing vessels.	Not applicable.	Not applicable.	Unknown.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Other federal activities having potential VEC effects	Assessed in Scallop SAFE Reports	No apparent increase in causalities related to crew limits.	No interactive effects on safety known.	Same as proposed action	Closed area management in other FMPs could have safety implications.

Table 157. Summary of cumulative effects: **VEC = Fishing Dependent Communities.** Community impacts generally occur through the amount of revenue derived from fishing and related employment. Generally management measures that improve yield and fishery activity have positive effects on fishing communities.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Sections 7.1.1 and 8.8	Depending on mobility of a fishing-dependent community's vessels, temporary area closures can have negative effects, but re-opened controlled access areas can have the opposite effect.	Effects similar to past ad hoc rotation.	Actions in other plans that limit the effectiveness of area rotation could have negative effects on nearby communities.	Higher landings, revenues and employment will have a positive effect on communities.
Georges Bank area access	Sections 7.1.1 and 8.8	Mostly positive effects, but vessel re-location from Mid-Atlantic ports may have had negative local effects.	Effects similar to past access programs.	Same as above.	Unlike past actions, vessels may not need to re-locate to take advantage of Georges Bank area access, because they will be able to exchange trips with other vessels. This will reduce negative local effects and improve benefits overall.
Hudson Canyon Area controlled access	Sections 7.1.1 and 8.8	Past controlled access has had positive effects for communities in the Mid-Atlantic and negative local effects in New England ports have been modest.	Effects similar to past access programs.	Same as above.	Same as above.
Area-specific DAS and trip allocations, with DAS tradeoffs	Sections 7.1.1 and 8.8	Positive effect through ability to use controlled access area DAS allocations to fish in regular, open areas.	Potential negative effect, because the use of DAS allocations is more restricted, possibly causing vessels to move.	No effect.	Positive long-term effects will be realized by reducing fishing mortality in regular, open fishing areas, improving yield and economic activity.
One-to-one controlled access area trip exchanges	Sections 7.1.1 and 8.8	Not applicable.	Positive effect from allowing more flexibility for vessels to fish locally.	No effect.	Positive cumulative effects are anticipated.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Broken trip exemptions (DAS adjustments)	Sections 7.1.1 and 8.8	Possible negative effect because the existing program provided a disincentive for vessels to access area with higher scallop productivity.	Positive effect because the proposed action reduces the risk of fishing in more productive areas, also addressing risk and safety issues.	No effect.	Trend toward positive impacts.
Carry over DAS	Sections 7.1.1 and 8.8	This measure provides flexibility for fishermen to determine when to fish, possibility have a positive impact on communities.	No change.	No effect.	Positive effects on communities.
Prohibit limited access vessels from fishing for scallops under general category rules	Sections 7.1.1 and 8.8	Not applicable.	Negative impacts on some communities whose vessels fished for scallops off the clock to supply local seafood markets.	Vessels may need to fish for other species from other ports to replace lost income causing negative impacts to some communities.	Slightly negative impact.
Management of general category fishery (status quo option)	Sections 7.1.1 and 8.8	Positive impact on communities by providing regular fishery income in small ports.	No change.	May provide an option for vessels to target scallops in response to more restrictive management measures in other FMPs, having a positive impact on communities.	Positive impacts, particularly for small ports with groundfish vessels facing more restrictive fishery management.
Status quo overfishing definition	Sections 7.1.1 and 8.8	Reducing mortality to meet overfishing definition reference points has promoted stock rebuilding, which has had a very positive impact on communities due to higher fishery revenue and port activity.	Possible negative effects if the overfishing definition mortality targets allow depletion of regional scallop biomass, causing vessels to relocate or fish in remote areas.	Larger habitat or bycatch closures in other FMPs could affect regional fishing mortality rates and scallop biomass levels, having a potential negative effect on nearby communities.	Trend toward negative effects, particularly if there are large permanent closures, unless future action is taken.
4" minimum ring size	Sections 7.1.1 and 8.8	Increasing ring size to 3½" has had positive impacts by improving yield, revenue and employment.	Similar positive effects are anticipated.	No effect.	Positive effects are expected, but disposal problems caused by old fishing gear may effect communities.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
10" minimum twine top	Sections 7.1.1 and 8.8	Bycatch reductions benefit other fisheries that may occur in communities that depend on other landings; therefore increasing mesh has positive effects.	Increasing the mesh to 10 inches is expected to have similar positive effects.	No effect.	Indirect positive effect from lower bycatch helping to rebuild other fish stocks.
Habitat closure alternative 6	Sections 7.1.1 and 8.8	Negative effects for nearby fishing communities.	Negative effects on communities because it prevents fishing on a productive part of the scallop resource.	Habitat closure alternatives in other FMPs may change the impacts on communities.	Communities will derive less income from the scallop industry, which will employ fewer people as a result.
TAC/DAS set-asides for habitat research	Sections 7.1.1 and 8.8	Not applicable.	Possible positive effect by increasing local employment.	No effect.	Possible positive community effect.
TAC/DAS set-asides for scallop research	Sections 7.1.1 and 8.8	Possible positive effect by increasing local employment.	No change.	No effect.	Same as above.
TAC/DAS set-asides to increase sea sampling	Sections 7.1.1 and 8.8	Same as above.	No change.	No effect.	Same as above.
Proactive protected species framework	Sections 7.1.1 and 8.8	Not applicable.	No effect.	Possible negative effect, depending on measures needed to address protected species issues.	Possible negative effect.
Revised bi-annual framework adjustment procedure	Sections 7.1.1 and 8.8	Positive effect on communities because framework adjustments have increased DAS allocations which improve port activity.	No change.	Unknown.	Positive cumulative effect by changing DAS allocations and improving yield.
Other Alternatives					
New overfishing definition	Sections 7.1.1 and 8.8	Not applicable.	Negative short-term impact from lower DAS allocations, but a positive long-term impact from higher scallop yield.	Habitat and bycatch closures in other FMPs would have a greater negative effect if the alternative overfishing definition were in place.	Positive cumulative effects due to higher landings, revenue, and employment.
Other habitat closed area alternatives	Sections 7.1.1 and 8.8	Not applicable.	Potential negative effects when combined with groundfish closed areas.	Potential for large community impacts if the closures conflict with habitat closures chosen in other FMPs.	Potential negative effects on communities because of an inability to access nearby scallop resources.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Area specific possession limits for finfish	Sections 7.1.1 and 8.8	Positive effects have occurred because finfish possession limits have prevented closures of access areas if finfish catches reach the TACs.	No change.	Future framework actions may have similar positive effects as past actions.	Positive.
Long-term closures with high bycatch	Sections 7.1.1 and 8.8	Not applicable.	Could have substantial community impacts if areas affect nearby ports.	Unknown.	Negative.
Incidental catch and general category permits	Sections 7.1.1 and 8.8	Not applicable.	Could have limited access to the fishery by small vessels from fishery dependent communities, causing a negative effect.	Unknown.	Negative.
Restriction on rock chains	Sections 7.1.1 and 8.8	Not applicable.	May have had local effects on fishery dependent communities that are near areas with rough bottom requiring rock chains.	Unknown.	Potentially negative.
No action/Status quo	Sections 7.1.1 and 8.8	Existing management has had positive effects on fishery dependent communities with scallop vessels and industry.	Negative impacts are expected, because the policies are no longer suitable given the condition of the scallop resource.	Complicated framework actions would be required to avert negative impacts of no action.	Although positive effects have occurred because the scallop resources has rebuild, negative cumulative effects are anticipated if fishing effort were not adjusted to respond to current conditions.
Other federal activities having potential VEC effects	Sections 7.1.1	Groundfish closures have had a very negative effect due to not achieving OY, reducing landings, scallop revenue, and employment.	Not applicable.	Ocean disposal, dredging, and other sea bed activities near scallop populations could reduce growth and recruitment or increase mortality and have a negative effect on OY and scallop revenue. Area closures to address protected species issues could similarly have a negative effect.	Cumulatively, actions that adversely affect scallop productivity or make scallops inaccessible to fishing have a negative effect on fishery dependent communities that rely on scallop fishing and landings.

Table 158. Summary of cumulative effects: **VEC = Marine Fisheries Law Enforcement and Administration.** Impacts on law enforcement and administration generally occur the complexity of regulations. Generally management measures that simplify regulations or improve compliance have positive effects.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Rotation area management	Section 8.9	Ad hoc rotation management has increase enforcement costs, but related rules have mitigated costs.	Negative effect, because flexible boundaries could increase monitoring and enforcement costs.	Unknown. Depends on future framework actions.	Framework actions may limit irregular boundaries or changes in boundaries once established. Other fishing regulations may make less costly boundaries and administration difficult.
Georges Bank area access	Section 8.9	Area access has increase enforcement costs, but related rules have mitigated costs.	Same as past management	Same as proposed action	Enforcement may become more complicated and costly when there are other special access programs at the same time. Broken trip adjustment could increase monitoring costs.
Hudson Canyon Area controlled access	Section 8.9	Controlled access has increase enforcement costs, but related rules have mitigated costs.	Same as past management	Areas reverting to fully open scallop fishing status will limit related enforce costs over time.	Broken trip adjustment could increase monitoring costs.
Area-specific DAS and trip allocations, with DAS tradeoffs	Section 8.9	Not applicable.	Slight negative impact from increased monitoring costs, i.e. two allocations to monitor instead of one.	Possible negative impact from increased monitoring costs, i.e. two or more allocations to monitor instead of one.	This management measure may apply to more fisheries that develop VMS monitoring.
One-to-one controlled access area trip exchanges	Section 8.9	Not applicable.	Negative impact from monitoring, administration, and enforcement of vessel-specific maximum number of trips by area.	Multiple controlled access areas open in the same fishing year could become complicated.	This management measure may apply to more fisheries that develop VMS monitoring.
Broken trip exemptions (DAS adjustments)	Section 8.9	Limited number of exemptions granted have limited monitoring and enforcement costs to a manageable level.	Negative impact due to higher enforcement and monitoring costs.	Negative impact due to higher enforcement and monitoring costs.	This management measure may apply to more fisheries that develop VMS monitoring.
Carry over DAS	Section 8.9	Slight negative impacts, but costs have been low.	No change.	Same as proposed action.	This management measure may apply to more fisheries that develop VMS monitoring.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
Prohibit limited access vessels from fishing for scallops under general category rules	Section 8.9	More vessels fishing with a 400-lb. possession limit could have higher costs, but monitoring has been sporadic.	Could lower enforcement costs because fewer vessels would be targeting scallops.	Same as proposed action.	May have neutral impact because limited access scallop vessels may target other species in lieu of scallops when not on a DAS.
Management of general category fishery (status quo option)	Section 8.9	Many vessels and many ports make enforcement difficult and costly.	No change.	No change.	More restrictive fishery regulations in other fisheries or a scallop price increase could cause an explosion in scallop fishing activity under a possession limit.
Status quo overfishing definition	Section 8.9	No effect.	No effect.	No effect.	Unknown.
4" minimum ring size	Section 8.9	3 ½ " ring enforcement has been effective and relatively easy to monitor despite the need for at-sea enforcement.	No expected increase in monitoring cost.	Same as proposed action	Could increase incentive to cheat with liners if large scallops are unavailable to the fishery due to habitat or other closures.
10" minimum twine top	Section 8.9	Enforcement monitoring has been effective and not too costly despite the need for at-sea enforcement, but fishermen can mitigate the effects by changing the way they hang the twine top.	No expected increase in monitoring cost, although the incentive to mitigate the effects could increase.	Same as proposed action.	May help lower finfish possession limit enforcement costs because finfish catches will be lower.
Habitat closure alternative 6	Section 8.9	Not applicable.	No change because boundaries coincide with existing closed areas.	Different habitat closures that are under development and review may create a new set of boundaries to monitor.	Could decrease the costs of other marine activities that adversely affect scallops.
TAC/DAS set-asides for habitat research	Section 8.9	Not applicable.	Slight negative impact to monitor special fishing activities.	Same as proposed action.	Other enforcement needs may decrease monitoring capabilities.
TAC/DAS set-asides for scallop research	Section 8.9	Monitoring and enforcement costs have been low.	Slight negative impact to monitor special fishing activities.	Same as proposed action.	Other enforcement needs may decrease monitoring capabilities.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
TAC/DAS set-asides to increase sea sampling	Section 8.9	Slight positive, because higher sea sampling frequency may have discouraged cheating.	Slight positive, because higher sea sampling frequency may discourage cheating.	Same as proposed action.	Could reduce controlled area access program enforcement needs, allowing enforcement resources to target other fisheries.
Proactive protected species framework	Section 8.9	Does not apply.	No effect.	Future rules may require costly enforcement.	Unknown.
Revised bi-annual framework adjustment procedure	Section 8.9	No tangible effect.	Less frequent management changes could improve enforcement and compliance.	Same as proposed action.	Unknown.
Other Alternatives					
New overfishing definition	Section 8.9	Not applicable.	No effect.	Lower fishing activity could reduce enforcement costs.	Unknown.
Other habitat closed area alternatives	Section 8.9	Not applicable.	New areas and boundaries to enforce and monitor would increase enforcement costs and decrease compliance.	Same as proposed action.	Actions in other fisheries could complicate enforceability.
Area specific possession limits for finfish	Section 8.9	Close monitoring with sea sampling and VTRs have kept costs low.	No change.	Possible increase in costs due to an increase in the number of possession limits.	Monitoring and enforcement of multiple possession limits for different fisheries could become very costly.
Long-term closures with high bycatch	Section 8.9	Not applicable.	Negative impact, because it would have required different or more closure areas.	Same as proposed action.	Monitoring and enforcement of fishery-specific area closures to avoid bycatch could become unmanageable.
Incidental catch and general category permits	Section 8.9	The number of participants and ports has complicated scallop possession limit monitoring.	No change.	Special access programs in rotation management areas could increase need to carefully monitor scallop bycatch.	More restrictive fishery regulations in other fisheries or a scallop price increase could cause and explosive growth in fishing activity under a possession limit and increase monitoring and enforcement costs.
Restriction on rock chains	Section 8.9	Not applicable.	Enforcement costs and training costs may have increased.	Protected species management may require rock chains to reduce turtle interactions.	Unknown.

Final Alternative	Analysis of Direct and Indirect Impacts	Effect of Similar Past & Present Actions or Other Federal Actions	Effect of Proposed Amendment 10 Actions	Effect of Reasonably Foreseeable Future Actions	Cumulative Effects
No action/Status quo	Section 8.9	Replacement of the meat count standard has improved enforcement and compliance.	Not applicable.	Not applicable.	Unknown.
Other federal activities having potential VEC effects	Section 8.9	Other enforcement activities and requirements may have limited enforcement of scallop regulations.	Other enforcement activities and requirements may limit enforcement of scallop regulations.	Same as proposed action.	Different regulations that apply to vessels participating in multiple fisheries reduce compliance and complicate enforcement.

8.1.8 Scallop Fishery Management

The overall intent of the Atlantic Sea Scallop FMP and Amendment 10 is to maximize the sustainable benefits from the scallop resource while minimizing adverse environmental effects, including those on habitat, bycatch, and the economy. The Scallop FMP has been highly successful in achieving these goals since 1994 by limiting access to the fishery, by reducing fishing effort to levels that improve sustainable yield, and by requiring gear modifications that reduce bycatch and possibly reduce impacts on habitat. Some of the cumulative impacts of these regulations are discussed below, but a detailed description of past scallop management is given in Section 7.1.2.

Since 1994, when the Council developed the limited access/day-at-sea program to manage the scallop fishery, nominal effort (measured in days-at-sea) have been halved and the number of vessels fishing for sea scallops have declined. There were 454 vessels that were initially eligible for a limited access permit, based on their historic fishing activity before 1993. Initially, vessels that qualified for a full-time permit were authorized to fish for scallops on 204 days, resulting in almost 45,000 days being actually used to fish for sea scallops. Day-at-sea use during 1991 and 1992, when the abundant year class was caught in the South Channel, approached 60,000 days and vessels used dredges with 3" rings (often at least triple linked) and a considerable amount of chafing gear, donuts, and cookies which limited escapement of small scallops, finfish, and other invertebrates. Often these heavy dredge bags full of small scallops and other bycatch were towed for hours on end, only to have the crew (often numbering more than 11) pick through the catch piles for scallops that were large enough to comply with a meat count regulation that applied at that time.

In contrast, there were 310 vessels with limited access permits in use (i.e. the vessel used one or more scallop days), generating 27,639 days of fishing effort. Most of these vessels furthermore were using dredges with 3.5-inch rings (double linked), with no chafing gear, cookies, or donuts allowing for more escapement of small scallops and bycatch. Eight-inch minimum twine top mesh allowed for greater escapement of finfish and a seven-man crew limit constrained fishing capacity per day-at-sea. Seventy-eight (78) vessels that qualify or hold limited access scallop permits were either inactive in the fishery or held a Confirmation of Permit History (i.e. the permit was not attached to a fishing vessel).

While nominal effort has been halved, effective fishing effort (measured in cumulative annual area swept by scallop fishing) has declined by about 80 percent. Resulting from measures developed in Amendment 4 and amplified in Amendment 7, the recovery of the resource coupled with crew limits and gear restrictions have produced this marked decline in effective effort. The scallop biomass has recovered from low levels because of the synergy between management measures in the FMP (i.e. effort reduction, gear restrictions, and closed areas) and favorable recruitment. Now the resource is considered rebuilt and the FMP is effectively reducing total area swept and keeping mortality near the fishing mortality targets, while producing the highest official landings on record with positive economic benefits to both producers and consumers.

During the four years from 1998 to 2001, the fleet revenue more than doubled despite the decrease in scallop prices by 40% from its 1998 level. The increase in revenues not only led to an increase in the incomes of fishers, it also had positive effects on the regional incomes and communities through the multiplier impacts of higher sales revenue from scallops. Sea scallop consumers benefited as well from the increase in the supply of scallops at lower prices. The yield per day-at-sea (LPUE) also improved dramatically from about 450 pounds per day-at-sea in 1998 to more than 1,200 pounds per day-at-sea in 2001 fishing year, lowering the operational costs (such as fuel, oil, water, ice and food) per pound of scallops significantly. This decline in operational expenses, combined with increase in

revenues, benefited scallop fishers by increasing their surplus, that is, the sum of profits and crew shares. As a result, the total benefits to the nation, measured by the sum of consumer and producer benefits, increased significantly during the same period.

The increase in the abundance of the scallop resource and productivity, as reflected by the higher LPUE's and lower price per pound, also helped to increase the competitiveness of the domestic scallop industry relative to the scallop imports from foreign countries. The import prices for scallops declined from an average \$5.96 per pound during the early 1980's to below \$4.00 per pound after 1992 as several countries competed to increase their exports to the U.S. market. In 2001, the average import price of scallops declined to \$3.25 per pound. The increase in the productivity of the scallop resource and landings helped the domestic industry to lower its prices and increase its share of the overall scallop market despite the influx of cheaper imports. For example, the importing of scallops to the U.S. declined to 40 million pounds in 2001 from 54 million pounds in 2000, whereas the share of the domestic scallops in total supply (i.e., domestic landings plus imports) increased from 37% in 2000 to 53% in 2001.

The increase in profits allowed vessel owners to re-invest and better maintain their vessels. Crewmembers, many lacking a formal high school or college education, are earning more than \$50,000 per year. Some are now able to invest in homes or another business. Vessels are better maintained, partly because the vessel fishes less time per year than in the early 1990's and partly because the vessel owner is deriving more profit from the catches. Money and time are available to haul out the vessels for repair and/or hire people to better maintain the equipment.

Building on the success of the FMP to lower mortality and rebuild the resource, the Council initiated Framework Adjustment 11 to the FMP, allowing controlled access to the surplus biomass in the southern half of Closed Area II. The Council leveraged the high biomass and catch rates expected there to reduce scallop mortality overall and reduce impacts, while achieving a higher net benefit from scallop fishing. To do this, the Council required vessels to use larger twine top mesh, restricted fishing to the less sensitive areas, restricted fishing by season to minimize bycatch, and set a yellowtail flounder bycatch TAC with mandatory observers to monitor it. Overall mortality and impact reduction was achieved by charging more days for each controlled access trip than were actually taken. In the first year of the program (1999), trips averaged 5 – 6 days, yet the vessels were charged 10 days-at-sea, thus reducing the amount of days the participating vessels could use elsewhere to target scallops.

Due to its success and the perceived environmental benefits, the Council continued and expanded the program in 2000, with Framework Adjustment 13. After an extended debate to analyze and consider the potential effects on habitat, finfish bycatch, and gear conflict, the Council established new access areas in portions of Closed Area I and the Nantucket Lightship Area, applying similar measures that were in place within Closed Area II in the previous year. Areas were defined where the bycatch and habitat concerns were the least, typically over sandy and small gravel areas within the groundfish closed areas. In addition to the added fishing restrictions for vessels fishing for scallops in these areas, the program reduced the total day-at-sea allocation by nearly 7,000 days that year through the day-at-sea tradeoff procedure. Just as important, vessels fishing in the controlled access program typically fished much less per day-at-sea, because the catches greatly exceeded the crew's shucking capacity. Vessels therefore often did not actively fish for large periods, while the crew caught up. Instead of only reducing the effective day-at-sea allocation by 7,000 days (about 20%), the bottom contact time compared to a day fishing elsewhere decline by 80 to 90 percent.

Unlike the groundfish closed areas, the Hudson Canyon and VA/NC Areas were closed to scallop fishing in 1998 specifically to postpone mortality on a strong year class. Fortunately, a second strong year class also appeared in 1999 within the Hudson Canyon Area. Again, building on the success of the controlled access program in the above framework actions, the Council designed a similar controlled

access program for these areas in 2001, 2002, and 2003 (Framework Adjustments 14 and 15) for the Hudson Canyon and VA/NC Areas. While the direct effects of the day-at-sea tradeoff were not as great (trips averaged 8.5 days for a 10 day charge), the program enabled the Council to again close the Georges Bank closed areas to scallop fishing, while improving net benefits. As a result, scallop effort and mortality on Georges Bank were extremely low.

While recent management has been highly successful in reducing fishing effort, scallop mortality, and environmental effects, Amendment 10 proposes new alternatives that could improve the effectiveness of management and further reduce the environmental effects of scallop fishing. To do this, Amendment 10 introduces rotation area management that would actively control the distribution and amount of fishing effort to take advantage of heterogeneities in the resource and the environment. In addition, Amendment 10 may also expand on the progress to date by requiring larger rings and twine top mesh to improve escapement without causing scallop loss, since more large scallops are now available in the fishery. In places, the benefits of closing areas to protect sensitive and valuable habitat could exceed the cost from closing the areas to fishing. Amendment 10 also considers and analyzes the potential effects of this management approach, considering the practicality of those management alternatives to achieve an environmentally sustainable result.

Most of the alternatives in Amendment 10 will not have an adverse cumulative effect on other laws and regulations. In fact, some of the alternatives could enhance the ability of other FMPs to achieve their goals and objectives. Larger twine top mesh, larger dredge rings, seasonal closures to reduce bycatch, bycatch TACs, and projected reductions in effective fishing effort (from area rotation) have the potential to lower bycatch, reducing mortality on species managed by other FMPs. Amendment 10 proposes alternatives that would establish controlled area access programs for areas that are presently closed to scallop fishing. The Georges Bank groundfish closed areas were originally closed to scallop fishing under the NE Multispecies FMP to “gear capable of catching groundfish” to enhance rebuilding potential and to protect spawning habitat. The controlled access program, as it pertains to the Georges Bank groundfish closed areas, will include seasons, enhanced observer coverage, 10-inch twine top mesh, bycatch TAC(s), and possibly other measures to minimize the cumulative impacts on other managed species.

Although vessels with limited access scallop permits hold a variety of other fishing permits (Table 51), there is no reason to expect that the alternatives in Amendment 10 by themselves would cause scallop vessels to increasingly target other species. Lower day-at-sea allocations, however, may be needed to achieve the scallop mortality objectives of the FMP, due mostly to an increasing number of active scallop permits and a greater use of allocated days by active scallop vessels, coupled with annual fishing mortality targets that have followed a gradual reduction schedule from Amendment 760. Some vessels may try to make up for changes in scallop revenue by targeting other species while not on a day-at-sea, provided they have the needed permit. Most scallop vessels, however, are designed to tow dredges and are poorly designed to use other types of fishing gear, but vessel owners may make the needed modifications to do so. Nevertheless, the economic analysis (Section 8.7) estimates that the day-at-sea allocations in Amendment 10 will be above break-even levels due to the high catches expected in the projections (Section 8.2.1).

60 Amendment 7 gradually reduced fishing mortality to achieve the rebuilding objectives and anticipated a reduction to $F=0.15$ to achieve rebuilding. Once rebuilt, the fishing mortality target is 80% of F_{max} , currently estimated to be $F=0.24$. Since reducing full-time day-at-sea allocations from 142 to 120, the annual fishing mortality target in Amendment 7 has declined from 0.28 in 1999 to 0.20 in 2003, or a 29 percent reduction. Further reductions of days were deemed unnecessary in 2000 to 2003, because of the conservative effects from the day-at-sea tradeoffs, crew limits, and closed areas.

Habitat closures may reduce the day-at-sea allocations (with the proposed overfishing definition) and are likely to reduce total scallop catch, on the other hand. Since bottom habitat tends to be more complex and sensitive in New England, the proposed habitat area closures are unevenly distributed. The overall economic impacts of the habitat closure alternatives are analyzed in Section 8.7.4.5, and the distributional impacts on fishing communities and ports are analyzed in Section 8.8.4. On one hand, communities and ports in New England states will lose a disproportionately high share of scallop revenue, but on the other hand these same ports are more likely to benefit from the improved condition of essential fish habitat that occur nearby.

Amendment 10 also proposes new procedures for adjusting management measures and a different fishing year. These measures are proposed to make administration less burdensome and enable the management of an area rotation plan. Additional reporting requirements or landings procedures may also be required for vessels with limited access or general category permits. It is not expected that these changes will have an adverse effect on NMFS, the Council, or the Coast Guard to administer and/or enforce regulations for other fisheries or laws.

Recent observations and information has found that scallop fishing with dredges have more interactions with sea turtles than previously thought. Thus cumulative impacts on endangered and threatened species may occur when rotation area management policies close areas in the northern part of the scallop range and more intensively fish rotation management areas in the southern part of the range under a controlled access program when areas re-open to scallop fishing. To mitigate these potential impacts, Amendment 10 includes a procedure for minimizing these impacts when they are anticipated under area rotation. The Council may, for example, allow controlled access to rotation management areas that overlap sea turtle distributions only during those portions of the year when sea turtles not as prevalent.

As filter feeders, scallops are sensitive to pollutants and suspended sediment. Besides the obvious effect of toxic pollutants that could increase scallop mortality, reduce settlement, and/or decrease marketability, activities that increase sediment suspension could alter feeding behavior and make the area less suitable for scallop growth and survival. This environmental dependence is described in Section 7.2.1. Activities that could have these types of impacts include but are not limited to bottom dredging (e.g. sand mining), ocean dumping, and oil and gas drilling, when they occur in optimum areas for scallops. These areas are characterized by relatively clear moving water; having shell, sand, to moderate gravel substratum, within depth and temperature ranges described in Section 7.2.1. Especially important area areas with persistent oceanic fronts that concentrate larvae over suitable settlement areas. Many of these areas are found within the circulation pattern around Georges Bank and adjacent to the Great South Channel. The Hudson Canyon Area and the Atlantic shelf in the DelMarVa region are also important areas for settlement and strong year classes.

Although formal mitigation is not required due to actions taken by the FMP and potential actions taken in this amendment, Amendment 10 could enhance reporting requirements and sea sampling to collect better information with which to manage the fishery and/or identify cumulative effects that require action through future amendments and/or framework adjustments.

Quantitative and qualitative analysis of the direct and indirect effects on the human environment are presented in detail in the following sections.

8.1.9 Essential Fish Habitat

Cumulative impacts are the combined outcome of numerous actions and stresses, which alone may have relatively minor impacts, yet add up to severe habitat degradation or loss (Vesta et al., 1995). Fishing and non-fishing activities influence habitat function. Depending on the characteristics of habitat, including spatial and temporal variations, physical, biological, and chemical properties, both human and natural threats can impact habitat differently.

It is important to recognize that although the cumulative impacts of the scallop fishery have impacted habitat, there have also been significant limits on the fishery, which have potentially improved essential fish habitat in certain areas of the Northwest Atlantic. Scallops in New England have been managed since 1982 by a multitude of management strategies that primarily focus on reducing fishing mortality of some stocks, and rebuilding all stocks to sustainable biomass levels. Many of these measures have had incidental benefits on habitat such as large year-round closures, reduced effort, and gear restrictions. Although these measures were not originally intended for habitat purposes, it is important to consider their cumulative benefit, and if they remain unchanged, some of these measures in place may potentially continue to benefit essential fish habitat for scallops and other species.

Measures to manage Atlantic sea scallops (*Placopecten magellanicus*) were initially implemented through emergency measures on May 15, 1982. The Council's fishery management plan, which mirrored the emergency rules, took effect shortly thereafter. The FMP instituted a meat count standard of 40 meats per pound for shucked scallops and a minimum shell height of 3 ¼ inches for scallops landed in the shell. These measures remained in effect during a one-year phase-in period, after which measures were to be adjusted to 30 meats per pound and a 3 ½ inch minimum shell height standard. In June 1983, however, the NMFS Regional Director invoked the Plan's temporary adjustment provision and set the meat count at 35 meats per pound and the shell height standard at 3 3/8 inches. From 1982 through 1993, the FMP relied exclusively on age-at-entry (meat count) controls, measures which were based on how large and therefore how old a scallop was before it was legally harvestable. Amendment 4 changed the primary management strategy to an effort control program for all resource areas.

Since the original plan, there have been nine (9) amendments and fifteen (15) framework adjustments. A description of these actions can be found in Section 7.1.2. In summary, however, the sea scallop fishery is governed primarily by day-at-sea allocations, crew limits, gear restrictions, and ad hoc area closures to achieve annual fishing mortality targets and achieve maximum sustainable yield (MSY). These efforts have been very successful, reducing fishing mortality and allowing biomass to recover nearly to the long-term targets well ahead of schedule. During the last seven years, the amount of fishing effort has declined from 45,000 days in 1992-1993 to 23,000 days in 2000-2001. At the same time, the number of limited access permits has declined from around 450 in 1994 to 340 in 2000. Only 276 of the 340 limited access permits used allocated days-at-sea in the 2000 fishing year. At the same time, age 2 and 3 scallops have become less vulnerable to the fishery because of gear restrictions, crew limits, and the Hudson Canyon and VA/NC Area closures. Overall fishing mortality on the Georges Bank stock has declined from 1.51 in 1991 to 0.15 in 1999 (NMFS 2001a), while biomass has increased from 1.30 kg/tow in the 1991 survey to 9.08 kg/tow in the 2000 survey.

Amendment 10 does recognize that there will be increased benefits to habitat from Amendment 13 to the Multispecies FMP as well as Amendment 2 to the Monkfish FMP, which are reasonably foreseeable actions. Additionally, there are little man-made impacts in these offshore fishing grounds because most of the impacts are in estuarine and coastal waters. Just about the only impact, with the exception of some cables, pipelines etc, are due to fishing activities. Since the passage of the EFH components of the Magnuson Act (SFA) in 1996, impacts to habitats are being minimized due to the new