

prepared with an expansion in the normal framework adjustment process time line to accommodate the more in-depth analysis.

The longer framework adjustment cycle could reduce administrative costs arising from frequent extensive analysis, review, and approval currently associated with framework adjustments. The longer cycle would be adequate to manage the scallop resource and fishery.

5.2 No Action and Status quo

Some of the alternative sections in Section 5.3 contain unique status quo or no action alternatives that are also described within each section. For example, for management measures to minimize the adverse effects of fishing on EFH, a status quo/no action alternative is presented which would implement no further EFH measures. These are presented so that each set of alternatives can be considered separate from area rotation and area management and other alternatives to improve scallop yield. Otherwise, the entire set of alternatives within Amendment 10 would have to be adopted or not, eliminating flexibility in the Council and Agency's choice and decision making.. Throughout all the alternatives described in Section 5.3, a status quo alternative is described relative to the issue being addressed by the set of alternatives (e.g. area rotation, effort allocation, minimizing habitat impacts, data collection and monitoring, etc.).

The status quo describes what would transpire if Amendment 10 was not adopted and future annual framework actions were approved to meet the Amendment 7 plan objectives. This outcome includes adjustments to the annual day-at-sea allocations to meet the fishing mortality target ($F=0.2$) in Amendment 7 as well as the possibility of future access to areas now closed areas under controlled conditions or the possibility of new scallop closures on an ad hoc basis. Although the impact on habitat (including the effect of the year-round groundfish closed areas) was analyzed in the Omnibus EFH Amendment 9, no areas would close to scallop fishing for the purposes of protecting habitat, with the exception of the present HAPC for cod on Georges Bank.

Where there is a difference between the current management rules and those that would transpire under the status quo, an additional No Action alternative is also described below. For example, the No Action alternative includes the current Amendment 7 schedule of day-at-sea allocations and no access to the Georges Bank groundfish closed areas. The controlled access program for the Hudson Canyon and VA/NC Areas would furthermore would cease when the Framework Adjustment 15 action expires on February 28, 2004. No action would mean that the Hudson Canyon and VA/NC Areas would be treated as normal, open scallop fishing area under nominal Amendment 7 regulations. On the other hand, No Action would also mean that scallop fishing would not occur under any circumstances in the Georges Bank groundfish closed areas, until the Northeast Multispecies FMP re-opened the areas to "gears capable of catching groundfish". Therefore under the No Action alternative, habitat in the existing groundfish closures would not be affected by scallop fishing, similar to Habitat Alternative 1 (Section 5.3.4.1).

Thus, a 120 full-time day-at-sea allocation with continued controlled access to the Hudson Canyon and VA/NC Areas does not meet the standard of being either the status quo or no action. A status quo day-at-sea allocation appears to exceed the maximum fishing mortality threshold in the present overfishing definition and would be an unlikely outcome of status quo management. Nevertheless, in some analyses of scallop management, a scenario assuming the 2002 day-at-sea allocation and use has been included for comparison.

5.3 Preferred and Non-preferred Alternatives

One major purpose of Amendment 10 is to introduce new management to the fishery that benefits from the heterogeneities in the resource and the environment – improving the effectiveness of management to maximize benefits while reducing environmental effects from traditional scallop fishing.

This section describes the preferred and non-preferred alternatives that the Council considered in Amendment 10. Although the Council sometimes selected non-preferred alternatives or modified alternatives based on public comment and supplementary analysis, the content of this section was not changed (except for a few minor corrections and removal of “preferred” for the title of alternatives) to retain the original description of the alternative and rationale before the public and Council at the DSEIS stage. The Council’s rationale for the final alternatives and proposed action, as well as an undated description of alternatives that were modified based on public comment and supplemental analysis is given in Section 5.1.

The alternatives are grouped by their primary intent, but may have important and secondary effects that achieves or helps achieve other objectives. Raising the minimum ring size, for example, reduces mortality on small scallops and improves yield, but also improves gear efficiency for larger scallops. It therefore takes less towing time to capture an equal number of large scallops. Similarly, area rotation improves the distribution of effort, favoring more productive areas for scallops and at times reducing the amount of tow time to capture an equal amount of scallops.

Both increases in ring size and area rotation improve yield, but also reduce tow time which can reduce bycatch and habitat effects for the target scallop fishing mortality rate. For simplicity, the alternatives are described once in the following sections, but where these multiple effects are thought to be important, the alternative is listed in each appropriate section.

Status quo and no action alternatives: In each of the following sections, a status quo alternative and possibly a no action alternative is included and analyzed in Section 5.3. In some cases, there is no difference between the status quo and a no action alternative, and only a no action alternative is described. In other cases, there are important differences between the status quo and no action, where both are described. The following convention was followed in the document to identify the status quo and/or a no action alternative.

The status quo is interpreted as what management actions would transpire to meet the Amendment 7 mortality objectives, considering the status of the resource relative to the Amendment 7 overfishing definition. The status quo is interpreted as to what would be the likely result for area access policies, including treatment of the Hudson Canyon Area as a re-opened area and presuming no access to the Georges Bank groundfish closures. The status quo alternative is not interpreted to mean the current management status under conditions that prevailed in 2001 and 2002, i.e. **the status quo is not interpreted as a 120 full-time day-at-sea allocation** because it may not achieve the Amendment 7 mortality target.

The no action alternative, on the other hand, is interpreted as what management actions would transpire in the absence of any change in regulations, thus the no action alternative applies to all of the sections below. As such, the day-at-sea allocations after 2002 would revert to the published Amendment 7 day-at-sea schedule and the Hudson Canyon and VA/NC Areas would open to regular scallop fishing. These events would occur when no action is taken, because the two-year day-at-sea and area allocation provisions of Framework Adjustment 14 would expire.

Short term management actions: Because Amendment 10 introduces an adaptive management approach, it is difficult and unrealistic to specify management measures beyond the 2004 fishing year. In particular, the future day-at-sea allocations would depend on the status of the resource in various management areas, dictated by the most recent annual or enhanced industry survey. The allocations, TACs, and closures would depend on future events, primarily scallop recruitment which is highly variable and unpredictable on an annual or area-specific basis.

To the extent that current data allow, estimates of area-specific allocations or days-at-sea or trips with possession limits are supplied for 2003 and 2004. These and the specific areas that would be closed to fishing at that time depend in part on the 2002 annual survey results which will be conducted later this year.

The 2001 survey data is however useful and provides a satisfactory estimate of the management measures that are likely in 2003, because the results of the area rotation strategies and allocation mechanisms described below depend on the status of the resource. The status of the resource in 2003 is largely related to the projected age structure of the population in 2001 and the realized mortality rate in 2002, but may be affected by recruiting scallops first observed in the future 2002 survey. Although the 2002 recruitment could affect the 2003 projection, the scallop stocks have an age structure that reflects recent management decisions that led to large scallops in Closed Area I and the Nantucket Lightship Area, slightly smaller scallops in the Hudson Canyon Area, few scallops in the VBA, and smaller scallops in Closed Area II (due high mortality rates in 1999 and a large 2000 recruitment event) and in the Mid-Atlantic open areas (due to high fishing mortality for the past several years). The fishing fleet, however, have directed little effort in the open areas of Georges Bank (except for the area southeast of Chatham that had been proposed for closure in Framework Adjustment 14, but not implemented).

As a result of the above events and projected stock structure, the day-at-sea allocations in 2003 and potentially 2004 can be estimated fairly well and we can also estimate the probability that rotational management areas would close to fishing because it met closure criteria. There is very little short term differences between the area rotation alternatives in 2003 and 2004, because the results are dominated by the current resource condition and management controls. On the other hand, probable area closures in Amendment 10 might suddenly change after the 2002 scallop survey due to new recruitment.

5.3.1 Overfishing definition

The Council considered revising the overfishing definition to be more consistent with area rotation and the effect of long-term closures on scallop management. Both definitions use the same biological reference points, F_{max} and B_{max} . F_{max} is currently estimated to be 0.24 and is used as a proxy for F_{MSY} which is unknown. Consistent with the National Standard 1 guidelines, F_{max} is used as a maximum fishing mortality threshold and the annual target is 80% of that value.

The biomass target is the biomass expected to occur based on equilibrium yield-per-recruit calculations when the stock is fished at F_{max} . The value of B_{max} estimated in Amendment 7 using 1982 to 1997 data was 8.16 g/tow for scallops on Georges Bank and 4.10 g/tow for scallops on the Mid-Atlantic shelf. Amendment 10 would update these targets using 1982 – 2002 recruitment data, revising the Georges Bank target to 5.30 kg/tow and the Mid-Atlantic target to 6.26 kg/tow.

5.3.1.1 Proposed

The proposed overfishing definition would set annual fishing mortality thresholds to achieve maximum yield-per-recruit from scallops that are or will potentially become available to fishing. These

annual thresholds will vary according to the rotation area management situation at the time. The biomass target would continue to be defined as B_{max} , but the minimum biomass threshold would be revised to $\frac{1}{2}B_{max}$. The details of the proposed overfishing definition are described in Section 3.4.1.

Rationale : A revision in the overfishing definition is needed to achieve optimum yield, establishing annual mortality targets that apply to areas that are presently or will become available for fishing. The revision is also necessary to allow fluctuations in the annual fishing mortality rate to achieve optimum yield from area rotation, consistent with the policy of achieving an optimum mortality rate for a cohort, averaged over time, which will maximize its yield-per-recruit. Moving the minimum biomass threshold from $\frac{1}{4}B_{max}$ to $\frac{1}{2}B_{max}$ would improve consistency with the National Standard 1 guidelines, without forcing another round of rebuilding and causing economic disruptions.

5.3.1.2 Status quo

The existing overfishing definition would continue in force. The fishing mortality target would be a fixed parameter (80 percent of F_{max}) and would apply to the entire resource, regardless of whether the scallops contribute to yield. The minimum biomass threshold would remain at $\frac{1}{4}B_{max}$. The details of the status quo overfishing definition are given in Section 3.4.2.

Rationale : The status quo overfishing definition will achieve optimum yield if sufficient areas remain or become open to scallop fishing. Also the zero mortality in long-term closed areas²³, while not affecting the harvest rate in open fishing areas, have conservation benefits and act as a source of spawning activity.

5.3.2 Alternatives to Improve Scallop Yield

One major purpose of Amendment 10 is to introduce new management to the fishery that benefits from the heterogeneities in the resource and the environment – improving the effectiveness of management to maximize benefits while reducing environmental effects from traditional scallop fishing. One way to do this is to manage the distribution and amount of fishing effort much better than has been possible under the existing management regulations.

Unlike the current management system that allocates days to vessels for fishing in any open area, scallop fishing effort can be identified with specific areas. Where the scallops are small or where the effects on habitat or bycatch are higher than in other areas, fishing effort can be reduced by strategically closing areas. In some cases, areas would close over a long term to protect important resources. In other cases, areas might close seasonally to avoid bycatch or over several years to allow growth of high abundances of small scallops. Other areas with large scallops, where gear efficiency is high, or where environmental impacts are low, fishing effort might be raised to be consistent with a **rotational management** approach.

Several types of rotational management approaches are presented below as alternatives, ranging from the simplest form of area rotation to more complex, adaptive strategies. The simplest form of area rotation only requires identification of discrete area boundaries and a regular schedule for rotation closures. The most complex strategy, allows for adaptive decisions for when to close an area, for when to re-open the area to fishing, and even the size and shape of areas that are closed and later could be fished under rules that deviate from the norm to maximize net benefits. These area rotation strategies are described in Sections 5.3.2.2 to 5.3.2.8, categorized as follows:

²³ Long-term closures would not be available for future scallop fishing under area rotation policy. Examples of this are habitat closure areas, like ones described in Section 5.3.2.2.

1. Mechanical rotation with fixed area boundaries
2. Adaptive closures, for a fixed duration and with fixed area boundaries
3. Adaptive closures and re-openings, with fixed area boundaries
4. Adaptive closures and re-openings, with fixed boundaries and mortality targets or frequency of access that vary by area
5. Adaptive closures and re-openings, with adaptive boundaries identified by survey when the areas are closed
6. Georges Bank access to groundfish closed areas

Even without closures, fishing effort management by area could improve scallop yield and reduce habitat effects. Without restrictions on where vessels fish (other than the existing area closures to protect groundfish), the fishery has a history of targeting scallops long before they have reached optimum harvest size. Under certain conditions, it can be more lucrative for commercial fishing vessels to target the small scallops that are aggregated than dispersed large scallops. These short-term responses by fishermen can create a pattern of localized overfishing by increasing the mortality of small scallops that are caught before their contribution to landings is at its maximum. At the same time, larger scallops (assuming that they survived early targeting by the fishery) are not fished at appropriate levels and biomass is lost due to natural mortality.

Even though large scallops may be available elsewhere, the contagious distribution of scallop settlement creates a large biomass of small scallops that can be more valuable for vessels to target than a more dispersed distribution of larger scallops. To some extent, the higher processing cost for targeting small scallops and the lower price per pound is sufficient to keep vessels from targeting the small scallops. With a maximum crew size, the ability to land shucked scallops per day-at-sea declines with smaller size. Vessels with a seven man crew can shuck about 40,000 to 50,000 scallops per day and landings therefore double when the count declines from 30 to 15 meats per pound, for example. Many times, the price per pound also is higher for larger scallops, although market dynamics can change this general pattern.

In addition to reducing localized overfishing, **area based management** (described in Section 5.3.2) can accommodate regional differences in scallop growth and mortality rates, as well as regional differences in dredge efficiency and non-catch mortality on different bottom substrates. Some information is known about these effects is known [e.g. scallop dredges are more efficient and have less non-catch mortality in sandy areas (Section 8.2.1) and have been included in the biological estimates, but even without complete knowledge, area base management offers benefits over stock-wide effort allocations for the reasons given in the above paragraph.

Two non-area based management alternatives are also described below. Increasing the dredge rings from 3 ½-inches to 4-inches reduces mortality on small scallops, which in turn increases yield as these fast-growing scallops escape capture. Another alternative proposes to rebalance the day-at-sea allocations by gear sector, based on the amount of mortality per day created by vessels using each gear. The difference arises from the variation in size targeted and landed by vessels using each gear, rather than from differences in area swept after adjustments to correct for differences in swept area by the two gears. Shifting days from the gear that catches smaller scallops to the one that catches larger scallops potentially has the same effect as improving gear selectivity or area rotation that reduces the availability of small scallops to fishing.

5.3.2.1 General area rotation policies

The following general policies would apply to the area rotation management strategies described in the following sections, including mechanical and adaptive strategies, but not including area-based management (which does not specifically include area rotation).

Unlike the current management measures, area rotation would introduce a systematic structure that determines where commercial vessels may fish for scallops and for how long. Area rotation also establishes a planned set of criteria or guidelines that would regularly close areas to fishing when small scallops are more abundant than large scallops, due to abundant new recruitment, due to the effects of fishing, or both. Areas would close when the expected increase in exploitable biomass exceeded a pre-defined level and re-open to fishing when the annual increase was less than another, lower threshold. This happens when the stock structure favors young, fast-growing scallops or older, slower growing scallops, respectively.

Three types of areas would be established under an area rotation management system: Closed rotation area, re-opened rotation area, open fishing areas. In addition to these classifications, Amendment 10 may also create long-term closures to protect sensitive habitat or avoid bycatch where it is exceptionally high and cannot otherwise be avoided. The general area rotation rules for these area classifications are described in Table 11.

Table 22. General management structure for area rotation management.

Area type	Criteria	General management rules	Who may fish
Closed rotation	Biomass growth rate exceeds a pre-defined ceiling; biomass in newly closed areas (after accounting for existing closed areas) may not exceed a pre-defined upper limit.	<ul style="list-style-type: none">• No scallop fishing allowed• Scallop limited access and general category vessels may transit closed rotation areas provided fishing gear is properly stowed.• Scallop bycatch must be returned intact to the water in the general location of capture.	<ul style="list-style-type: none">• Any vessel may fish with gear other than a scallop dredge or scallop trawl• Zero scallop possession limit
Recently re-opened	Biomass growth rate is less than a pre-defined floor after closure. Status expires when time averaged mortality declines to resource-wide target.	<ul style="list-style-type: none">• Fishing mortality target is determined by time averaging since the beginning of the most recent closure.• TACs and special limits on day-at-sea or trip allocations with a possession limit and day-at-sea tradeoff.• Transfers of scallops at sea would be prohibited• Potential gear conflicts will be reduced by timely notification of fixed gear	<ul style="list-style-type: none">• Limited access and general category vessels may fish for scallops only on authorized trips.• Other vessels may fish with non-scallop gear.• Vessels with incidental catch permits may be allowed to retain more than 40 pounds.

Area type	Criteria	General management rules	Who may fish
Open	Scallop resource does not meet criteria to be classified as a closed rotation or recently re-opened area	fishermen that may have gear set in a closed scallop rotation area.	<ul style="list-style-type: none"> • Limited access vessels may target scallops on a regular day-at-sea • General category vessels may target sea scallops with a daily possession limit. • Transfers of scallops at sea would be prohibited
Long-term closures	Areas closed to protect habitat, avoid bycatch, or for other reasons.	Closed to fishing by vessels using one or more gear types	Vessels may use any gear not prohibited.

Area rotation also allows for differences in annual fishing mortality targets to catch scallops at a higher than normal rate, precisely (used in a relative sense) when the scallops are at an optimum size. This optimum is defined by a biomass growth rate that declines as scallops age below losses due to natural mortality. Interestingly, it also is defined by a gear efficiency vector with scallop size (see comparison of 3 ½ and 4-inch rings in Section 8.2.8), reducing the tow time (and environmental impacts) needed to catch scallops that maximize yield (appropriately reduced to account for risks due to uncertainty and to achieve economic and social objectives). Thus when scallops are abundant and near the optimum size, fishing mortality should be higher during that time than the appropriate level that would generally apply otherwise.

One way to account for temporary changes in annual fishing mortality is by using time averaged fishing mortality, such that the average for an area since the beginning of the last closure will be equal to the resource-wide fishing mortality target (80% of $F_{max}, F=0.20$). To do this, either the length of time when a rotation area is deemed to be “recently re-opened” should be known, or the average annual fishing mortality target for recently re-opened areas is set in advance.

In addition to a constant target fishing mortality rate for recently re-opened areas, the annual target may change over the time when an area is recently re-opened, **as long as the average since the last closure doesn't exceed the resource-wide target**. Sometimes an area may re-open when not all the scallops there are at optimum size or the high biomass in re-opened areas cause surges in landings (which affects price). As a buffer, the annual TAC and fishing mortality target for an area may vary from a constant target fishing mortality rate during a re-opened status. This approach seems particularly useful when rotation closures are shorter (2-4 years) rather than longer (5 or more years).

For example, after a closure period of three years and a planned re-open period of another three years, the time-averaged fishing mortality target is 0.4 [i.e. 0.2 times 6 years divided by 3 years (the total period as a re-opened area)]. A useful variation on this calculation (and one that is risk adverse and reduces variability in landings) is to catch scallops at less than 0.4 in the first re-opened year, at 0.4 in the second year, and higher than 0.4 in the third (and last) re-opened year. The first year might be fished at a rate of 80% of the time averaged target (or $F=0.32$), the second year at 100% ($F=0.40$), and the third year at 120% ($F=0.48$).

In a recently re-opened rotation management area, hard quotas may apply and these areas would close to fishing for the year when landings equal the TAC, irregardless of whether some vessels had authorized trips remaining.

Whether or not the annual fishing mortality target increases with time or not, the time-averaged fishing mortality declines to the norm in the seventh year (i.e. $F=0.20$). Also, in the seventh year (or whenever the time averaged fishing mortality target declines to the norm), the fishing area becomes reclassified as an “open” fishing area under general scallop fishing rules and under most of the strategies below, there would be no area specific limits or a hard TAC.

Variations (often dictated by adaptive area rotation strategies) on the above example include the length of the closure, the length of the recently re-opened period, and the “ramping” strategy applied to the annual mortality targets in the re-opened areas. The following tables show how this would work:

Table 23. Example of ramped fishing mortality targets for re-opened areas, compared to mortality targets with no rotation and simple rotation with constant fishing mortality targets when re-opened. See Sections **8.2.1** and for analysis of impacts.

YEAR	Year N	1	2	3	4	5	6	7 - N	1	All
Status	Open	Closed	Closed	Closed	Re-opened	Re-opened	Re-opened	Open	Closed	Average
No rotation	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Simple rotation	0.20	0.00	0.00	0.00	0.40	0.40	0.40	0.20	0.00	0.20
Ramped rotation	0.20	0.00	0.00	0.00	0.32	0.40	0.48	0.20	0.00	0.20

Table 24. Management policies and fishing mortality targets for rotation areas.

Area type	Rotational management policy	Annual fishing mortality target and TAC
Closed rotation	Temporarily closed to scallop fishing	Set to zero
Recently re-opened	<ul style="list-style-type: none"> • Area specific day-at-sea allocations or trips with possession limits and day-at-sea tradeoffs • Quotas (“hard TACs”) apply and areas close when landings meet the TAC. • Areas re-open to fishing at the beginning of the fishing year (Section 5.3.9.4), unless there is a seasonal closure to avoid unacceptably high bycatch of finfish or turtles. 	Equals the time average since the beginning of the last closure, possibly modified by a ramped strategy (e.g. 80%, 100%, 120% of the time-averaged target for three consecutive years) during the re-opened period.

Area type	Rotational management policy	Annual fishing mortality target and TAC
Open	<ul style="list-style-type: none"> • Open to scallop fishing under general rules • Target TAC applies and day-at-sea allocations based on the number of days calculated to achieve the target • Rotational management areas that are in an open status may have seasonal closures to avoid unacceptably high bycatch of finfish or turtles 	Equals 80% of F_{max}
Long-term closures	Closed to scallop fishing	Set to zero

Boundaries of rotational management areas:

The chart below (Map 7) shows the boundaries of rotational management areas associated with fixed boundary strategies in the following alternatives. Although there are exceptions, the overwhelming majority of scallops and scallop productivity are contained within the candidate boundaries.

Nine rotational management areas in the Mid-Atlantic region are mostly arranged along strips of three ten-minute squares, until reaching the vicinity of Hudson Canyon, where the coastal shelf bends and scallops are distributed along a northwest-southeast axis. From Hudson Canyon to Long Island, the candidate rotational management areas run diagonally, using long, straight boundaries to accommodate the different resource distribution and reduce community and vessel size impacts associated with an inshore/offshore bands of potential closures.

Scallops in the Georges Bank region are not as neatly organized as those in the Mid-Atlantic, because the bathymetry is less orderly from the arrangement of Georges Bank. The candidate boundaries also take into account, the existing management areas that have influenced the distribution of the resource. Management can take advantage of this difference in resource distribution in the groundfish closed areas, at least over the short term, to improve or stabilize yield and effort allocations, using these areas as a reservoir.

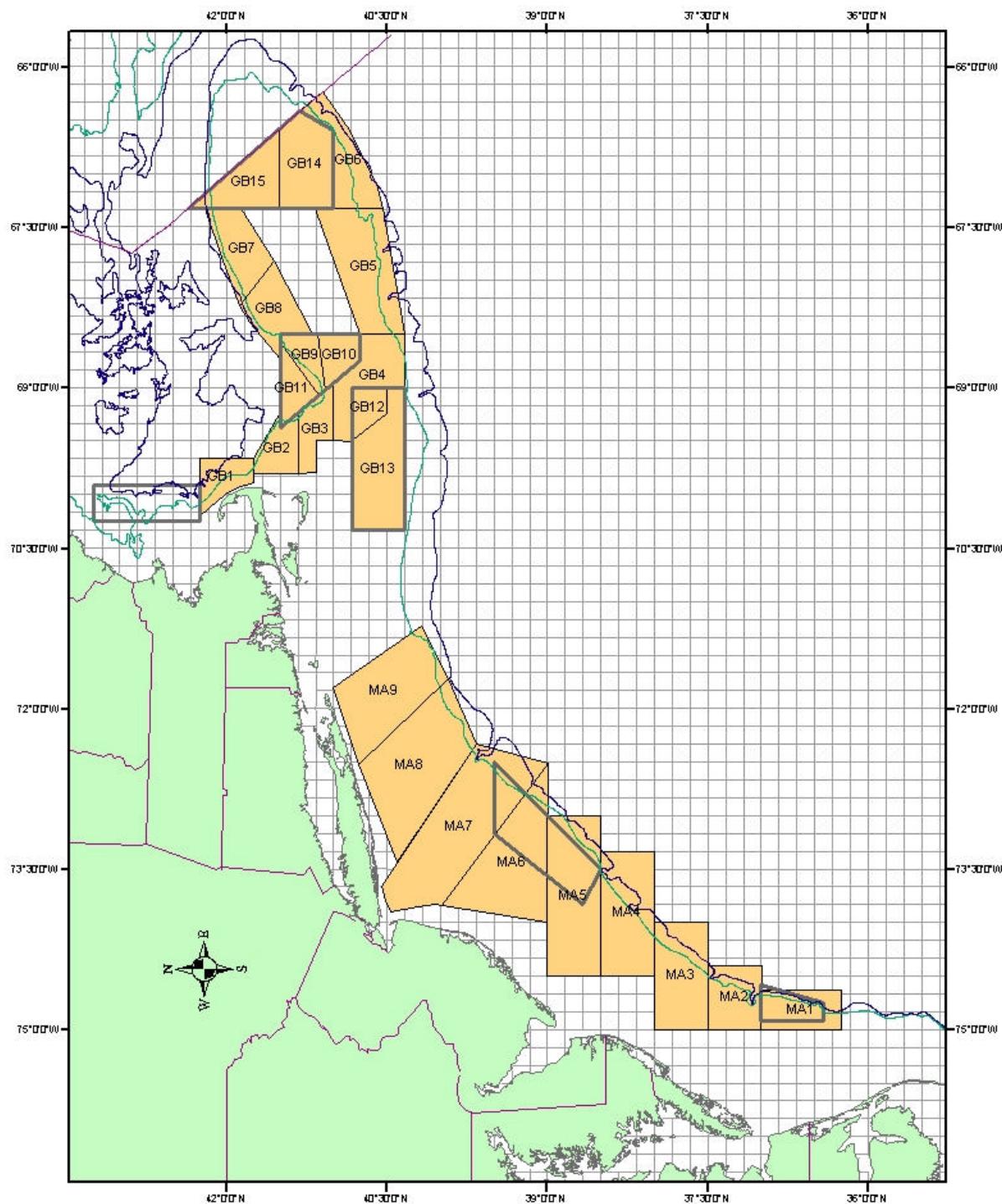
Taking these factors under consideration, the rotational management areas in the vicinity of the Great South Channel are drawn in east-west bands, but the southern bands move to the east because of the axis of the channel and the boundaries of Closed Area I and the Nantucket Lightship Area. In addition, two areas (GB9 And GB12) follow the boundaries established by Framework Adjustment 13, which took habitat, bycatch, and gear conflict concerns into account.

On the central and eastern part of Georges Bank, the candidate area boundaries use straight lines to cover the edge of Georges Bank, where scallops occur. Few scallops are found on the top of Georges Bank or in the deep waters off the bank. Closed Area II is split into two rotational management areas, recognizing the difference in features found in the two areas and using the boundaries established by Framework Adjustment 11, which took habitat, bycatch, and gear conflict concerns into account.

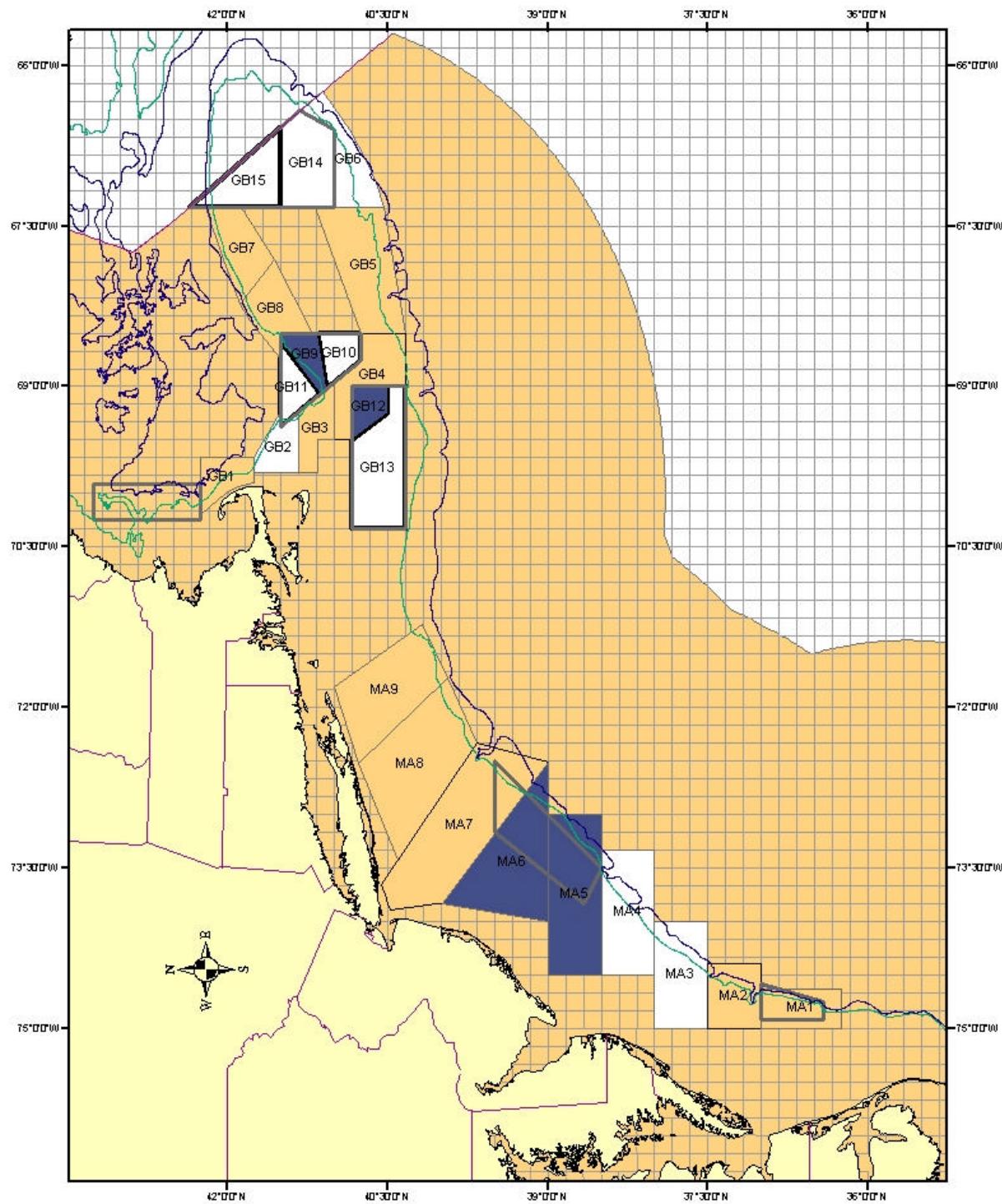
Although the PDT chose these areas to evaluate the performance of different area rotation systems in a general sense, the choices were made while considering the resolution of existing data (survey and commercial) and the general ability to manage and enforce understandable regulations.

Where possible, these candidate boundaries followed the advice of the Council's Enforcement Committee (i.e. straight boundaries along lines of latitude and longitude) and partly developed during initial deliberations about area rotation during 2000 (i.e. latitudinal strips of three ten-minute squares in the Mid-Atlantic region and blocks of 6 to 9 ten-minute squares in the Georges Bank region. No boundaries were evaluated or proposed in the Gulf of Maine, due to the relatively sparse source of information about the resource or the fishery.

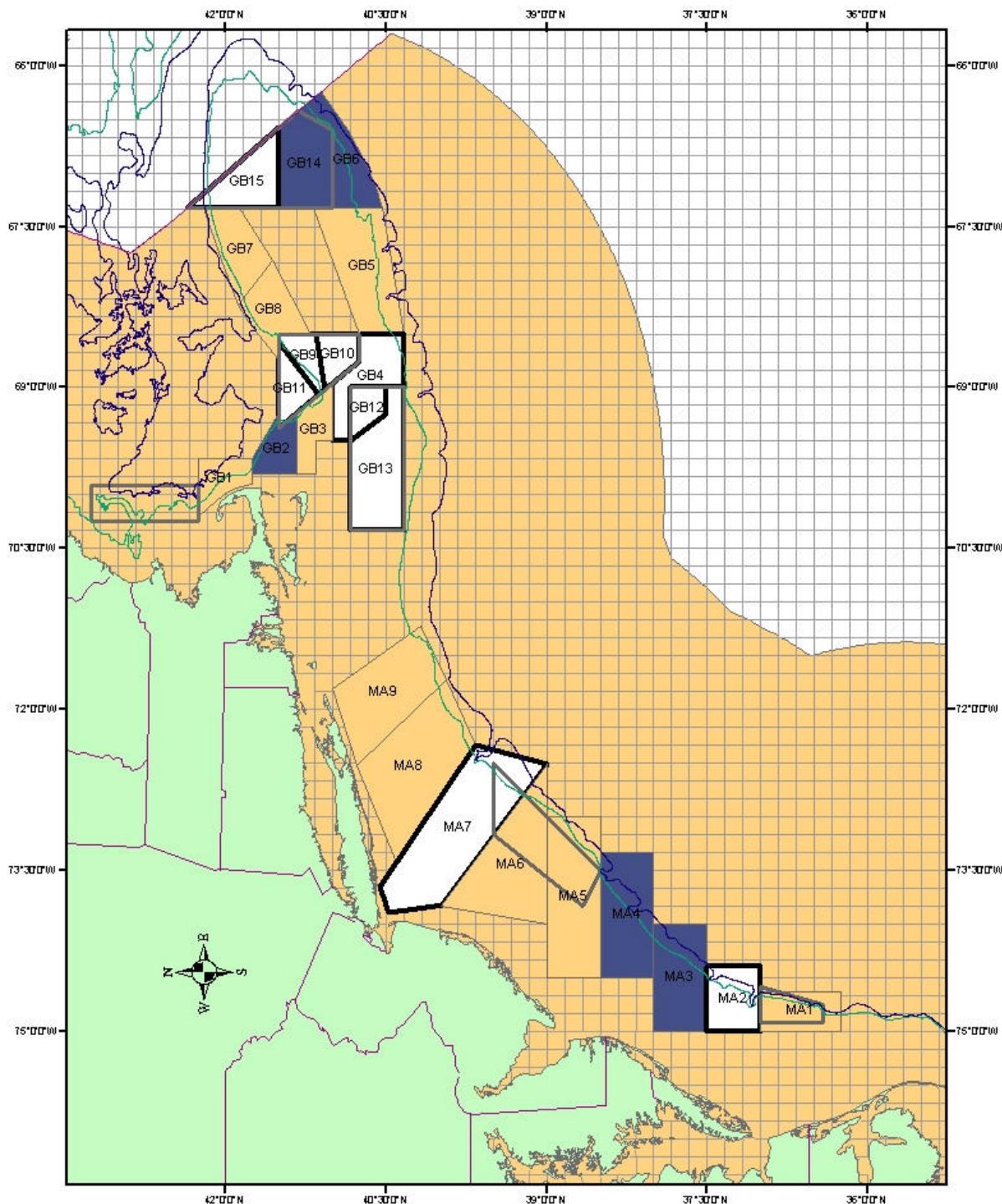
Modest changes in the configuration and boundaries of one or more of these proposed areas is unlikely to radically change the analysis and evaluation of area rotation systems. Nonetheless, it will be difficult, if not impossible to select fixed boundaries that are ideal and if the Council chooses a fixed boundary area rotation system, it is likely that minor modifications from time to time will be necessary as problems arise or because new information exists.



Map 7. Candidate area rotation boundaries analyzed in the DSEIS to evaluate area rotation systems with fixed boundaries using existing resource data.



Map 8. Example area rotation scenarios, where white areas represent closed rotation areas and blue areas represent re-opened rotation areas. All orange areas would be open to normal scallop fishing by scallop vessels with limited access and general category permits.



Map 9. Example area rotation scenarios, where white areas represent closed rotation areas and blue areas represent re-opened rotation areas. All orange areas would be open to normal scallop fishing by scallop vessels with limited access and general category permits.

5.3.2.2 Mechanical area rotation with fixed area boundaries

Rotation management areas (e.g Map 8 and Map 9) close and open in order according to a fixed schedule and the amount of closed area in any one year is in the same proportion as the proportion of years that areas close. Rotation schedules ranged from 3 years open/3 years (i.e. 50% of areas close at any time) closed to 5 years closed/1 year open (i.e. 83% of areas close at any time).

The initial choice of areas to close when implemented would be those areas that have the smallest average size of exploitable scallops, followed annually by other areas in geographic order, from south to north in the Mid-Atlantic region and from east to west in the Georges Bank region. Rotation areas in the Mid-Atlantic and Georges Bank regions would be treated separately, so that at least one area in each region is open to fishing every year.

For a 3/3 year rotation schedule, the annual adjustment would rotate the areas sequentially, i.e. year 1 – areas A, B, C; year 2 – areas B, C, D; year 3 – areas C, D, E, etc., until the whole schedule recycles in N years²⁴. N minus three areas would be open to fishing and “recently re-opened” targets and management rules would apply to some areas for three years that were previously closed. Time averaged mortality limits would apply and since the closed and re-opened schedule is fixed, the time averaged fishing mortality rate is two times the general fishing mortality target (i.e. 80% of F_{max})

For a 5/1 year rotation schedule, the same strategy would apply, but a re-opened status would apply for one year according to the time averaged mortality limit, equal to six times the general fishing mortality target for one year, followed by an annual target equal to 80% of F_{max} until the area closes again.

Rationale : Other than the initial choice of areas, mechanical rotation is the least costly form of area rotation, because the boundaries are fixed and the subsequent choice of areas to close does not depend on surveys. On average, benefits accrue because the areas that are scheduled to close have been opened for the longest time and the age structure of those scallops are the most affected by fishing. The system therefore tends to close areas with smaller scallops than areas that are slated to open. On the other hand, occasionally an area would close despite the presence of abundant, small scallops or re-open to fishing precisely when a large year class of small scallops is present.

Probable short-term consequences

The short-term consequences for mechanical area rotation are the same as for adaptive closures (Section 5.3.2.3) with fixed duration, because the initial selection of closed area would be based on the same information as the criteria used in the adaptive closure rules.

5.3.2.3 Adaptive closures, for a fixed duration and with fixed area boundaries

The next simplest area rotation system is to choose which pre-defined areas (e.g. Map 7) should close to fishing on an annual or more frequent basis. The criteria for area closures would be a minimum potential biomass increase (range 10 – 40%) and a maximum amount of exploitable biomass (range 25 – 75%) that would be protected when areas first close. The potential biomass increase is the annual change in the total biomass of scallop meats if no fishing occurs. Exploitable biomass is the total meat weight of scallops that are selected by fishing, accounting for gear and cull size, at the beginning of the fishing year. The Council may, at its discretion, vary from these criteria to reduce risk of recruitment failure (i.e.

²⁴ N years is equal to the number of areas for a given region.

respond to an overfished condition) or to improve yield (i.e postpone mortality on exceptionally high recruitment).

The proportion of exploitable biomass in closed rotation areas may increase above this ceiling due to the growth of biomass while closed for a fixed amount of time. An area, once closed, would remain closed for a pre-defined period (range 3-5 years), when the area would be classified as “re-opened” (see Section 5.1.3.1). When scheduled to re-open, an area may remain closed for a second cycle if it still meets both criteria for closure and has the highest potential biomass growth rate. Such an event could occur if there was an exceptional recruitment event just before an area is slated to re-open.

Table 25. Rotation management rules for adaptive closures, with fixed duration and fixed boundaries.

Action	Criterion 1	Criterion 2
Rotational management areas would close when:	The potential biomass growth must exceed a pre-defined value (15–40%, 25% preferred)	The exploitable biomass in newly closed areas shall not exceed a pre-defined limit (25-75%, 25% preferred)
Rotational management areas would remained closed:	For a fixed duration (3-5 years, 3 preferred)	Not applicable
Rotational management areas would re-open to scallop fishing when:	The fixed duration closure expires	Not applicable
Rotational management areas would be classified as recently re-opened:	For a period no greater than the length of closure, or when the average exploitable meat weight is no greater than 20 percent of the average meat weight in regular open fishing areas	Not applicable

If the number of areas that exceed the growth criteria would close more than the ceiling on the amount of exploitable biomass to conserve via rotational closure, then the areas with the highest growth rate would be chosen first. In sequential order, if a candidate area that met the growth criteria pushed the total amount of exploitable biomass over the maximum limit, the area would not be closed in that year, or until the biomass in the closed areas fell below the biomass limit, or when closed areas re-open to scallop fishing.

Scalloping grounds outside the groundfish closed areas would be divided into fixed areas, about 9 in Georges Bank (in addition to the groundfish closed areas) and 9 in the Mid-Atlantic. There areas at any given time would be characterized as being either closed, open-unrestricted, or recently reopened-restricted fishing. No more than some percentage (somewhere between 25-75%) of each of three broad regions (Georges Bank, New York Bight, and Delmarva/Virginia Beach/NC) would be closed at any one time. New closures would be determined after the annual survey and any supplemental industry survey has been completed and analyzed. Areas would be ranked according their potential biological growth rate of an area (in percentage terms). The highest ranking areas (i.e. those with the smallest scallops which tend to grow faster relative to other areas with larger scallops) would be closed if they meet a minimal threshold for potential biological growth rate, and if they do not bring the percentage of the potential productivity that is closed in the region beyond the level allowed. If that more areas meet the closure threshold than can be closed, the ones with the highest suitability indices would be closed.

Through an automatic sunset provision, closed rotation management areas would normally close for three years, but may through framework adjustment (Section 5.3.9.3) or annual specification (Section 5.3.9.2) be closed for one or two extra years, or opened a year early under appropriate conditions. When reopened, areas would be subject to restricted fishing for two to three years. Fishing in the area would be limited by a TAC, and either a DAS tradeoff and trip limit, as is practiced presently, for that area. It would be best to "ramp up" the effort as the dominant cohort nears its full growth potential by starting at a low fishing mortality the first year the area is reopened, and increase it each year while classified as recently re-opened.

Rationale : Unlike mechanical rotation (Section 5.3.2.2), the order of closed area rotation would be adaptive, i.e. it would depend on the age structure of the resource in the rotational management areas. Adaptive closures of pre-defined rotational management areas prevent the closure of the wrong area that could occur under a mechanical rotation strategy.

Areas may meet the closure criteria simply because it had been subject to high fishing effort for lengthy periods (i.e. few large scallops) or due to recent above average recruitment (i.e. lots of small scallops), or both. Provided that the pre-defined areas are compatible with the annual survey data, annual evaluations and adjustments could rely on existing data, but smaller (and more) rotational management areas would be possible with added survey tows or additional cooperative resource surveys.

Other aspects of area rotation would not be adaptive, which could keep continuous monitoring costs at practical levels and would allow the industry to plan on upcoming fishing rules. Planning is possible, in this case, because there would be a very high probability that closed areas would re-open on schedule and based on the survey data, the amount of scallop landings when the area re-opens is predictable. Monitoring costs would be less than more adaptive strategies, because a detailed survey is needed only in the year before an area re-opens – to accurately estimate the TAC and effort limits when it re-opens. Continuous monitoring to determine whether an area should remain closed is unnecessary with a fixed duration closure.

Probable short-term consequences

In the short term – the management rules for the fixed boundary area rotation alternatives are dominated by the current status of the resource, where a significant portion of the biomass is in the groundfish closed areas on Georges Bank and in the Hudson Canyon Area. Although there is significant biomass in the open areas of the Mid-Atlantic, the highest mortality in 2001 and 2002 is and appears to be in the Delmarva region (rotational management areas MA2 to MA4) and along the inshore boundary of the Hudson Canyon Area (part of rotational management areas MA5 and MA6). Projections indicate that MA2 and MA4 have more than a 90% probability of closure with most area rotation closure criteria, and would remain closed for three or more years.

Likewise, the high mortality on 2000 recruits appears to be in rotational management area GB1 and GB7, which has a 50% probability of meeting the closure criteria, followed by GB2 or GB3. Rotational management area GB2 has a high probability of closure when GB1 and GB7 would presumably re-open in 2006, after a three-year closure.

The amount of landings and day-at-sea allocations between alternatives and closure criteria options vary little in the short term. Most of the differences in landings and day-at-sea allocations occur because of differences in Georges Bank area access policy (Section 5.3.2.8).

5.3.2.4 Adaptive closures and re-openings, with fixed area boundaries

Like the alternative above, rotational management areas would have pre-defined configurations and would close when the areas met criteria for potential biomass growth rates and for maximum percent of exploitable biomass in closed areas. Closed rotation areas would re-open when the potential biomass growth rate declines below a limit associated with the optimum harvest size. The duration of rotational closures will vary over time for each area, due to subsequent recruitment and resource conditions, allowing other areas with higher potential biomass growth rates to close.

Table 26. Rotation management rules for adaptive closures and re-openings, with fixed boundaries.

Action	Criterion 1	Criterion 2
Rotational management areas would close when:	The potential biomass growth must exceed a pre-defined value (15–40%, 25% preferred)	The exploitable biomass in newly closed areas shall not exceed a pre-defined limit (25-75%, 25% preferred)
Rotational management areas would remained closed:	Until the potential biomass growth rate declined below a minimum threshold (10-25%, 10% preferred)	Not applicable
Rotational management areas would re-open to scallop fishing when:	The potential biomass growth declines below a pre-defined value (10-25%, 10% preferred).	Not applicable
Rotational management areas would be classified as recently re-opened:	For a period no greater than the length of closure, or when the average exploitable meat weight is no greater than 20 percent of the average meat weight in regular open fishing areas	Not applicable

Scalloping grounds outside the groundfish closed areas would be divided into fixed areas, about 9 in Georges Bank (in addition to the groundfish closed areas) and 9 in the Mid-Atlantic. There areas at any given time would be characterized as being either closed, open-unrestricted, or recently reopened-restricted fishing. No more than some percentage (somewhere between 25-75%) of each of three broad regions (Georges Bank, New York Bight, and Delmarva/Virginia Beach/NC) would be closed at any one time. New closures would be determined after the annual survey and any supplemental industry survey has been completed and analyzed. Areas would be ranked according to a "closure suitability index" based on both the relative growth rate of an area (in percentage terms). Areas would be closed if they meet a minimal threshold in the suitability index, and if they do not bring the percentage of the potential productivity that is closed in the region beyond the level allowed. If that more areas meet the closure threshold than can be closed, the ones with the highest suitability indices would be closed.

Areas would close until the potential biomass growth rate declined below a pre-defined threshold. When one or more closed rotation areas meet the criteria for being re-opened, other areas with higher annual potential biomass growth rates could be closed, as long as the maximum limit on exploitable biomass in closed areas would not be exceeded by the new closures.

When reopened, areas would be subject to restricted fishing for two to three years. Fishing in the area would be limited by a TAC, and either a DAS tradeoff and trip limit, as is practiced presently, for that area. It would be best to "ramp up" the effort as the dominant cohort nears its full growth potential

by starting at a low fishing mortality the first year the area is reopened, and increase it each year while classified as recently re-opened.

Rationale : The premise for this alternative is the same as the one for adaptive closures with fixed duration and boundaries (Section 5.1.3.1), except that there may be times when a fixed duration closure would be too short or too long, depending on the scallop age structure in the area and subsequent recruitment after the area was originally closed.

The length of rotational closures therefore varies (see Section 5.1.3.1), but to keep the rotational closures from becoming chaotic, an area once closed would remain closed until the biomass declined below the threshold for re-opening it. If this occurs earlier than a fixed duration period, the adaptive re-opening would allow other areas with higher potential biomass growth rates to be candidate rotational closures (similar to a baseball salary cap). If subsequent recruitment is above average and the potential biomass growth rate in a closed area stays high, then the adaptive re-opening criteria would prevent a rotational closure from opening too early on small scallops.

Probable short-term consequences

The short-term consequences are the same as for the fixed closure duration alternative above (Section 5.3.2.3). Differences might occur in 2005 to 2007, however, because of recruitment events in 2003 to 2005, causing closed rotational areas to open earlier or later than expected. Over the intermediate term, the average annual landings should be higher than the above alternative, but the costs of continuously monitoring the age structure and potential biomass growth in closed areas during its closure would be higher.

5.3.2.5 Adaptive closures and re-openings, with fixed boundaries and mortality targets or frequency of access that vary by area

Unlike the other mechanical and adaptive rotational management alternatives, the management strategy described below considers other factors to define the annual fishing mortality target for re-opened rotation management area and in special management areas that have more sensitive habitat or above average bycatch, for example. These factors include considerations such as the relative size of scallops in re-opened areas, habitat sensitivity, or bycatch. For example, a re-opened area may have a different mortality ramping strategy (see Section 5.1.3.1) than normal because it has scallops that are very large when the area re-opens to scallop fishing, or vice versa.

Areas with above average habitat sensitivity or bycatch could also have a lower time-averaged fishing mortality target, instead of 80% of the Fmax value as specified in the overfishing definition control rule. For example, portions of the Georges Bank closed areas or other designated sensitive areas (Section 5.3) might be part of the area rotation system, but the time-average target mortality rate could be 50 percent of the overfishing definition target. In this case, the mortality rate and amount of fishing effort would be half of the normal amount, but the yield derived from these areas would be a greater fraction of the maximum sustainable catch.

This approach uses the area rotation approach described in Section 5.1.3.1 and the time-averaged mortality calculation for defining annual mortality targets for rotation management areas. It also allows for variations and contingencies in scallop size, habitat sensitivity, and bycatch to define the annual mortality targets and resulting TACs. It is therefore consistent with the proposed overfishing definition (Section 3.4.1), but allows a greater range of considerations when setting area-specific mortality targets.

This alternative would create four types of scallop areas according to their characteristics, having fixed boundaries until changed by plan amendment. Open areas would be those with a mix of scallops near optimum size for fishing. Rebuilt areas would be those with predominately large scallops and harvested at an above average level. Special management areas would be those that require a reduction in effort due to potentially high habitat or bycatch impacts. Finally, protected scallop areas would be those where scallop and possibly other fishing effort would be reduced to enhance survival of small scallops and increase future yield.

Open areas

Locations with a mix of scallops at optimum harvestable size considering the overall harvest rate. No less than 50% of the scallop resource area would be categorized as an open area and these areas should be widely distributed along the coastline to minimize local impacts.

Rebuilt areas

Locations where larger scallops predominate and if not harvested at the present time would begin to return a negative rate of return due to mortality and slow growth.

Special management areas

Locations where scallop fishing must be less than optimal for the scallop resource, because of sensitive habitat and/or unavoidable high bycatch or interactions with endangered or threatened species. Initially, these areas would be the same as the areas proposed for closure to reduce bycatch (Section 5.3.5.7) and habitat (Section 5.3) impacts.

Protected scallop areas

Locations where small scallops predominate and therefore scallop and possibly other fishing are curtailed (possibly to zero) to increase survival and future yield. No more than 25 percent of the scallop biomass will be included in protected scallop areas at any one point in time. Conceptually, these would be areas that exceed the potential biomass growth rate threshold in other area rotation alternatives and possibly other areas that are close to but not above the closure threshold.

Special management areas for habitat and bycatch are built in and integrated into area rotation system. Area closures are distributed geographically along the coastline to ensure local areas remain open for fishing by vessels from nearby ports. Area boundaries are fixed according to similarities of scallop biology and productivity, further subdivided by habitat or bycatch zones, with allocations that are inversely proportional to habitat sensitivity and bycatch vulnerability and proportional to habitat resiliency.

The following general rules would apply:

- ❖ All open areas are managed with the same control, i.e. days-at-sea or TACs, without tradeoffs or substitute allocations (e.g. trips and a possession limit)
- ❖ Initial area boundaries are fixed (not “adaptive”) using the same candidate area boundaries for other area rotation alternatives using fixed boundaries, until changed by framework adjustment (as opposed to specification setting)
- ❖ Initially day-at-sea allocations or TACs are not tradable, but fully open areas are geographically dispersed

- ❖ Harvest rates in all areas follow a pre-determined formula based on scallop size, projected scallop populations in other areas, vulnerability of habitat and bycatch to scallop fishing, including in some cases a zero fishing mortality limit in areas with very sensitive habitat or areas with bycatch that jeopardizes overfishing other managed stocks.
- ❖ All vessels receive equal shares of area-specific day-at-sea allocations or TACs, based on their permit category
- ❖ Allocations are area-specific in rebuilt and special management areas, but a vessel's allocation of open area days-at-sea or TACs may be applied in any open area

Harvest rates (rather than closures) would be controlled by the following guidelines and set by framework adjustment:

- ❖ All areas have an annual specification of day-at-sea allocations or TAC
 - Allocations for some areas may be zero for long periods
 - Frequency of non-zero allocations may be specified in Amendment 10 to address habitat and/or bycatch concerns
- ❖ Allocation is proportional to the average price per scallop
 - Allocation increases with declining average count, if the expected price is higher than smaller scallops
 - Allocation increases with price
- ❖ Allocation is proportional to abundance and future yield potential of all other areas
 - Allocation increases if scallop abundance and future yield are high
 - Preserves rebuilt scallops when abundance and future yield look bleak
- ❖ Allocation is inversely proportional to habitat sensitivity to scallop fishing and proportional to habitat resiliency
 - Measures that reduce habitat impacts (e.g. gear modifications, better precision of fishing locations, reduced contact time, etc.) could allow higher scallop allocations and landings
- ❖ Allocation is inversely proportional to the expected non-target catch per day-at-sea or per pound of landed scallop
 - Measures to reduce the bycatch (e.g. seasons, gear modifications, etc.) could allow higher scallop allocations and landings

Rationale : This alternative is intended to allow greater flexibility to set target fishing mortality rates in special management areas, while still making at least 75 percent of the exploitable biomass managed under general day-at-sea and crew limits. Because of this lower limit on the amount of biomass in closed or special management areas, much of the resource would still be open to general fishing and it would not require costly one-to-one trading of area-specific day-at-sea allocations or trips.

This strategy would provide greater flexibility to set area-specific target fishing mortality rates in re-opened areas, both to take into account differences in growth and natural mortality and also bycatch and habitat impacts. Area rotation would function the same as the above alternative (Section 5.3.2.4), but with a lower ceiling on the amount of area closed during a year. Fishing mortality targets in re-opened areas would be adjusted to take into account bycatch and habitat objectives, rather than relying on seasons, bycatch TACs, or indefinite closures.

Although the reducing fishing effort and area swept in areas with sensitive habitat, high bycatch, and/or small scallops will have benefits, there would be more uncertainty about the effects compared with other area rotation alternatives. This is especially true with regard to habitat impacts where, according to the Joint PDT meeting on habitat conclusions, the first pass of the dredge is the most damaging. On the other hand, the alternative may achieve a significant amount of the benefits of other methods without relying as much on area closures and area-specific limits on effort.

Probable short-term consequences

This alternative may require a lower level of fishing effort in areas that might otherwise be closed to scallop fishing. The specific results cannot be estimated at this time, because it relies on a more generalized approach to minimizing bycatch and habitat impacts.

5.3.2.6 Adaptive closures and re-openings, with adaptive boundaries identified by survey when the areas are closed

Unlike other area rotation alternatives, a fully adaptive strategy would estimate whether various configurations of potential areas meet closure and re-opening criteria. Ten-minute squares (Map 3) about 75 nm² are the proposed basis for evaluation, which is considerably smaller than the annual biomass estimates from the existing resource survey will allow. Instead, a procedure utilizing an industry supported survey described below would provide a detailed assessment of candidate rotational management areas.

The boundaries of the rotational management areas would be established by future framework adjustment, based on the distribution and abundance of scallops at size. The guidelines described below would keep the size of the areas large enough and regular in shape to be effective, while allowing a greater degree of flexibility to defined closed rotation areas.

Like other area rotation alternatives, the decision about whether an area should close or re-open to fishing would depend on its expected potential biomass growth rate if closed, following pre-defined criteria. Closure criteria range from 25 to 40 percent (40 percent preferred) and re-opening criteria from 10 to 25 percent potential biomass growth rates (25 percent preferred).

5.3.2.6.1 Closure shaping rules

Invariable roles: Boundaries and distribution of rotational closures

Scallop management regions would be divided into “blocks”, each approximately 75 square nautical miles in area, by the existing grid of latitude and longitude lines at 10-minute intervals. [West of 72°30’W], the blocks spanning the depth range [15 to 45 fathoms] are grouped into east-west “strips”, each 10 nautical miles wide, north-south. The blocks would be grouped into five “regions”:

- Gulf of Maine – [all blocks north of 42°20’N].
- Georges Bank – [all blocks south of 42°20’N and east of 68°30’W].
- South Channel – [all blocks south of 42°20’N, west of 68°30’W and east of 72°30’W].
- Hudson Canyon – [all blocks west of 72°30’W and north of 38°30’N].
- Southern – [all blocks south of 38°30’N]

Within these regions, the following rules would apply to determine the number and configuration of areas that would be closed to scallop fishing until the potential biomass growth rate declined below the minimum threshold, reclassifying the area as “recently re-opened”.

Invariable Rule: Number of Closures

Unless the combination of all other closed areas in a region exceeds the maximum acceptable closure extent, there will be one and no more than one scallop rotational closure in each region at any time, except the Gulf of Maine region. In that region, there may be either zero or one scallop rotational closure at any time. Areas indefinitely closed to scalloping (to minimize bycatch or habitat impacts, or for other reasons) will not be considered “rotational closures” for this purpose. If areas are temporarily closed to scalloping by management measures outside of this scallop rotation system, those areas may be (but need not be) considered to fulfill this requirement for having a rotational closure in each region. In other words, long-term or indefinite closures of scallop fishing areas may satisfy the requirement to have at least one rotational closure in each of the five regions.

Invariable Rule: Minimum Closure Sizes

Closures may be larger than but may not be smaller than:

- Georges Bank region: 9 blocks arranged in a 3x3 square.
- Hudson Canyon and Southern regions: 3 adjacent strips.
- Gulf of Maine and South Channel regions: Any 6 contiguous blocks, where blocks are considered to be contiguous if it is possible to pass from one to any of the others by only crossing the boundaries of abutting blocks with the six.

Where a closure spans the boundaries of two or more regions, it shall be at least as large as the minimum size for any of the regions concerned. In the Hudson Canyon and Southern regions, strips may only be closed or re-opened as whole units.

Invariable Rule: Maximum Closure Extent

Closures in each of the five regions may not close more than 50 percent of the scallop fishing areas, or 75 percent of the biomass, whichever is less. In no case will areas be closed under this rotational system if doing so would result in the total area closed to scalloping (including all closed areas, not simply rotational closures) exceeding 50% of the productive blocks in a region. For this purpose, the sum of the total blocks and that of those in closures will be weighted by the relative productivities for the ten-minute squares in a region (Map 2). Blocks that are cut by the boundaries of federal waters or by the boundaries of closed areas will be weighted pro rata to their included area. Similarly, no areas will be closed under this system if doing so would result in 75% or more of the scallop biomass in a region (as estimated by the best scientific estimates available) being in areas closed to scalloping.

If some blocks in a region are subject to seasonal closures to scalloping, the above requirement must be met at some point during the year. In addition, no areas will be closed under this rotational system if doing so would result in the total area closed to scalloping (including all closed areas, not simply rotational closures) at any point during the year exceeding 75% of the productive blocks in a region, with the weighted sum calculated as above. Similarly, no areas will be closed under this system if doing so would result in 90% or more of the scallop biomass in a region being in areas closed to scalloping at any point during the year.

Invariable Rule: Boundaries

Straight lines will form all boundaries of rotational closures. The internal angles between such lines will never be greater than 180°, except that 270° internal angles may be used when the boundary lines that meet at such an angle both extend for at least 21 nautical miles. Where possible, the boundaries will follow the edges of blocks (north-south and east-west boundaries). However, where a rectangular closure would enclose one or more corner blocks that would not themselves merit closure, the Council may select a diagonal boundary aligned from one corner of a block to one corner of another. Long-term closures abutting a rotational closure will be considered when applying this rule.

Basic Rules for closure

Subject to the above invariable rules, the areas to be included in each year's closures shall be selected so as to include as many as possible of the blocks for which the annual potential increase has been estimated to be above the closure criteria for the potential biomass growth rate, plus as many as possible of those blocks closed in the previous year for which the annual potential increase has been estimated as 25% or more, while incorporating as few other blocks as possible.

When it is not possible to include all of the blocks for which the annual potential increase exceeds the relevant levels, preference may be given to closing those with higher values of the product of current biomass and annual potential increase.

Low-Biomass Blocks

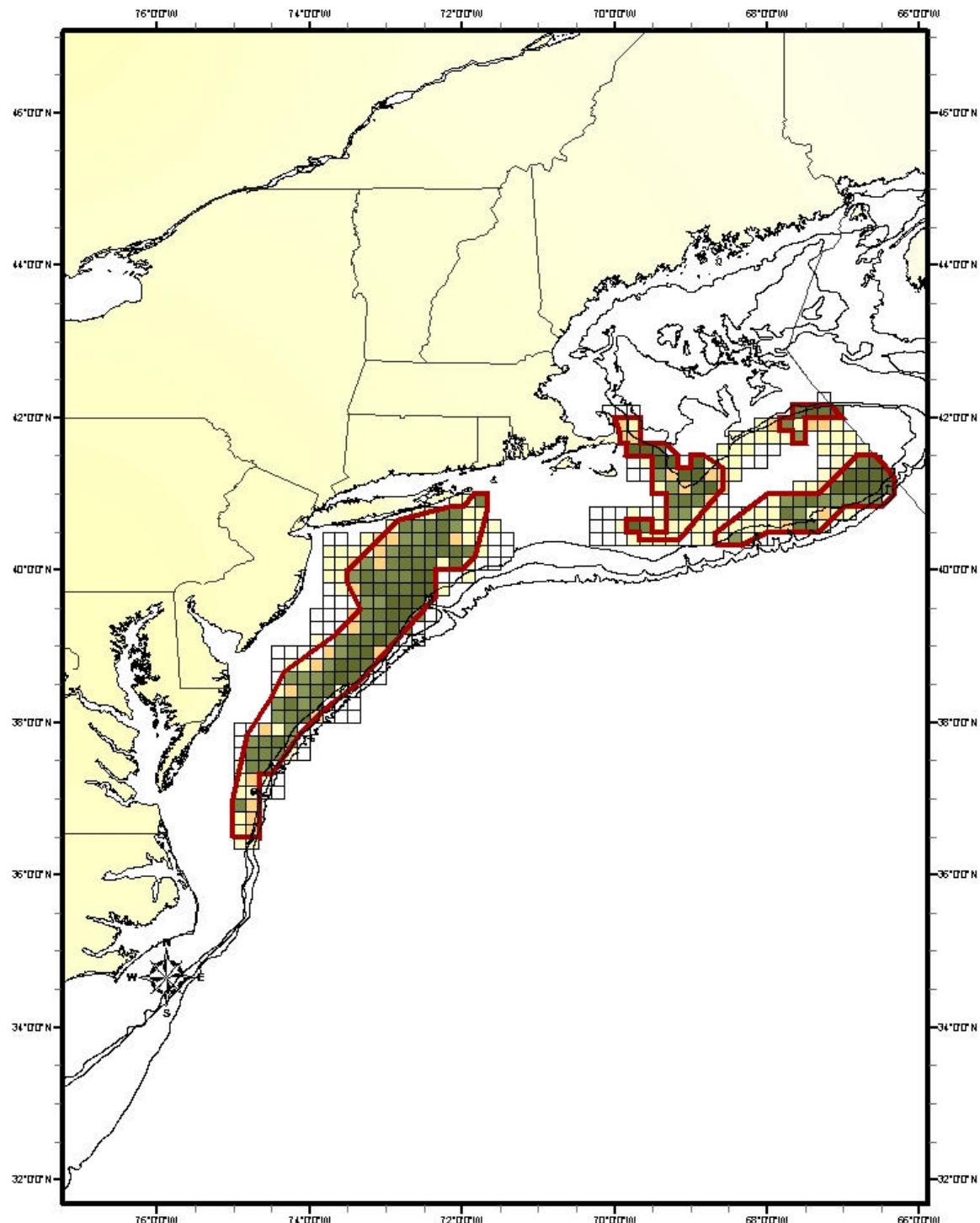
Blocks with scallop biomasses currently estimated as less than 400 tons of meats in the block will be treated as having zero annual potential increase when applying the basic rule. They may be included in rotational closures, however, when necessary to satisfy the requirements of the invariable rules.

Closure Expansion

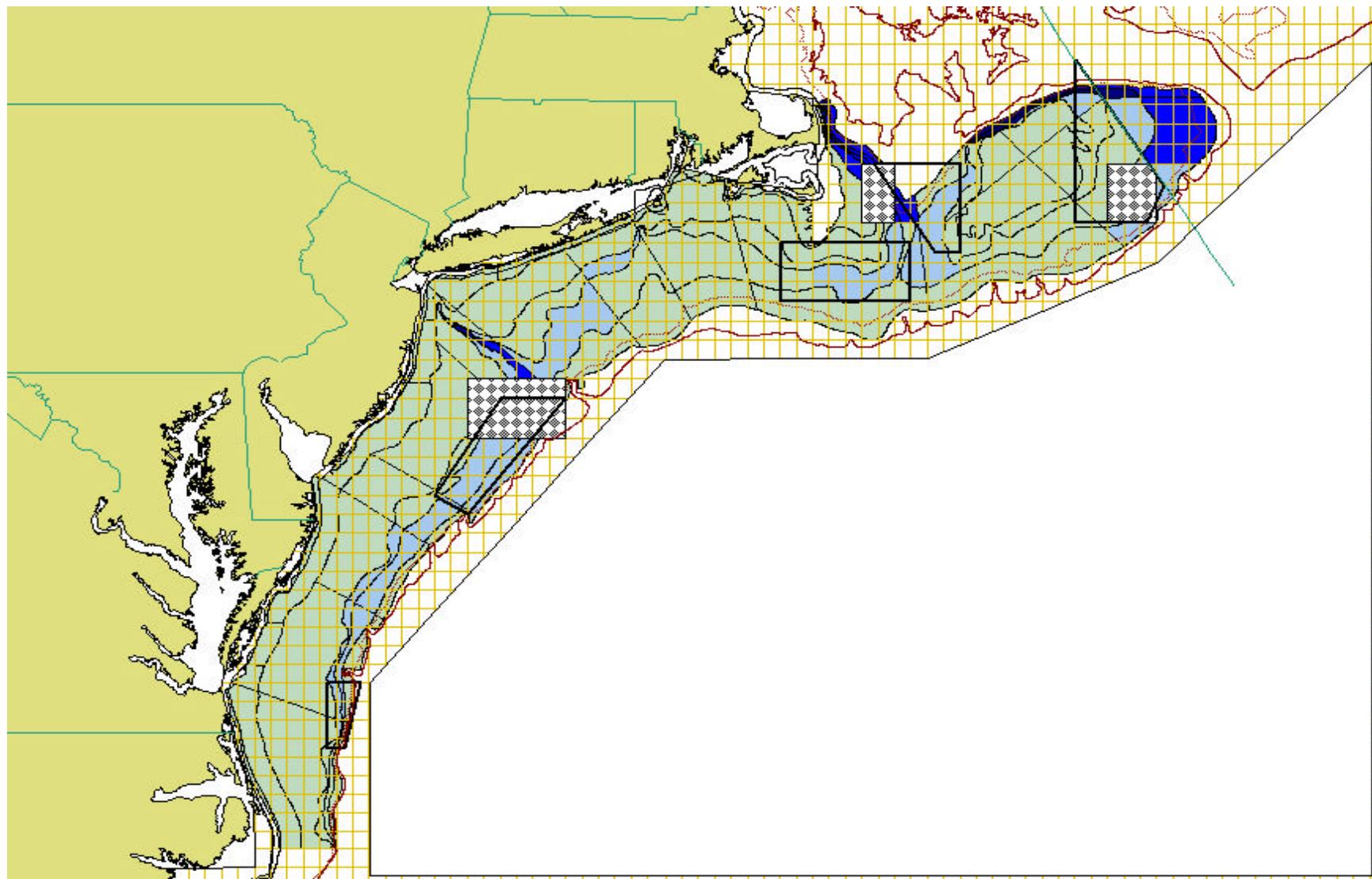
Blocks abutting a block in either the Georges Bank or South Channel regions that itself meets the annual potential increase requirements of the basic rule may be included in a closure if the directions of water movement are such that dispersal of scallops into the additional block from a closure is probable. Other blocks will only be added to closures when essential to meet the requirements of the invariable rules.

Overall Requirement

Except where required to meet minimum of one closure per region, each rotational closure must, as a whole unit, meet the requirements of the basic rule. For that purpose, the biomass-weighted average of the annual potential increases of the blocks included in the closure (with any part blocks further weighted by the proportion of their areas in the closure) must equal or exceed a biomass-weighted average of the [40%] target for those blocks not currently closed and [25%] for those under rotational closure in the previous year. Any long-term closures will be excluded from these calculations.



Map 10. Map of estimated scallop productivity by rotation management area, distributed by average recruitment by ten-minute square in the 1982 – 2000 scallop survey. Darker shades (green) represent higher productivity levels. The polygons encircle areas of high productivity.



Map 11. Example basemap for area rotation with adaptively managed boundaries, showing potential size and configuration of closures (hatched) to protect concentrations of small scallops.

The average scallop biomass in the blocks included in the closure (with any part blocks weighted by the proportion of their areas in the closure and excluding any long-term closures) must exceed 400 tons of meats per block. If no closure in a region (except for the Gulf of Maine region) can meet these requirements, the minimum-sized closure which would enclose the largest sum, across its included blocks, of the product of biomass and annual potential increase for each block shall be selected for rotational closure.

5.3.2.6.2 Closure Process

The closure process will use a notice action procedure described in Section 5.3.9.1 unless it coincides with an annual framework adjustment or annual specification (Section 5.3.9.2 and 5.3.9.3). The following description of a standard process includes an timeline that is compatible with the present fishing year. If Amendment 10 changes the fishing year, the standard process timeline described below would advance by the amount of months between the present and new fishing years.

Identification of appropriate closure areas would be based on either a combination of NMFS Survey and industry-based surveys or industry-based surveys alone. NMFS Surveys are not designed to identify resource conditions at the level of precision on which this alternative is based. Therefore, if NMFS Surveys are used, the NMFS Survey would identify broad areas which would need to be refined by further industry-based surveys. Alternatively, industry may locate areas during fishing activities and initiate industry-based surveys without NMFS Survey information

Standard Process

1. **July-August:** Discovery survey to locate areas with abundant seed, with shell heights 40-70mm. [The existing NMFS summer survey will serve as the discovery survey.]
2. **September:** Joint meeting of Scallop PDT, Scallop Advisors and Scallop Oversight Committee receives data from discovery survey and selects blocks for potential closure.
3. **September-October:** Commercial scallop boats, with pre-arranged charters and necessary exemptions, survey selected blocks using [NMFS survey dredges]. [Ten] randomized standard tows per block are required.
4. **November:** [NMFS] receives the data and calculates the “annual potential increase” (see below) of the scallops in each selected block. The number of years required before the annual potential increase will reduce to [25%] will also be estimated.
5. **November:** Joint meeting of Scallop PDT, Scallop Advisors and Scallop Oversight Committee receives results of calculations and, following the Closure Shaping Rules, develops closure alternatives, with the expected duration of each closure. Where more than one closure alternative is possible under the Shaping Rules, multiple alternatives will be prepared. If a region has blocks with re-opening days other than [March 1] and if new closures on [March 1] would violate the limitation on maximum closure extent, the joint meeting may prepare an alternative that would involve delayed closure of some blocks, provided all Shaping Rules are followed at all times.
6. **December:** Council holds public hearing and, if more than one alternative available, selects the closure option, including the expected re-opening date.
7. **December:** Regional Administrator proceeds under [Notice Action] process.
8. **March 1:** New closures take effect.

Additional Process

The following process will only be used in rare cases when a major seed bed has not been detected by the discovery survey.

1. Month 1: Fishermen detect area of dense seed not detected by discovery survey. Report seed to NEFMC. Joint meeting of Scallop PDT, Scallop Advisors and Scallop Oversight Committee determines whether additional closure may be appropriate and selects blocks for potential closure.
2. Month 2: Commercial scallop boats, with pre-arranged charters and necessary exemptions, survey selected blocks using [NMFS survey dredges]. [Ten] randomized standard tows per block are required.
3. Month 2: [NMFS] receives the data and calculates the “annual potential increase” (see below) of the scallops in each selected block. The number of years required before the annual potential increase will reduce to [25%] will also be estimated.
4. Month 2: Joint meeting of Scallop PDT, Scallop Advisors and Scallop Oversight Committee receives results of calculations and, following the Closure Shaping Rules, develops closure alternatives, with the expected duration of each closure. Where more than one closure alternative is possible under the Shaping Rules, multiple alternatives will be prepared.
5. Month 3: Council holds public hearing and, if more than one alternative available, selects the closure option, including the expected re-opening date.
6. Month 3: Regional Administrator proceeds under [Emergency Action] process.
7. Month 3: New closures take effect immediately.
8. Council proceeds to incorporate emergency closures into a subsequent Notice Action.

5.3.2.6.3 Monitoring and Re-Opening

6. All closed blocks will be surveyed annually by a commercial scallop vessel with a NMFS survey dredge to determine current biomass, size composition and growth rates. These surveys will also extend over all blocks immediately adjacent to a closed one. They will also cover all blocks currently subject to re-opening TACs.
7. NMFS receives the data and calculates the “annual potential increase” of the scallops in each closed block.
8. Block closures re-open on the appropriate opening day of the year set by the Council at the time of closure unless:
 - a: The discovery of additional seed of younger year-classes, during the period of a closure, requires extension of that closure,
 - b: The shaping of new closures requires re-opening in advance of the expected year, or
 - c: An early re-opening is made under an Emergency Action (e.g. if mass mortality of scallops in closure is suspected).No other alterations to the timing of re-opening may be made without a Plan Amendment.
9. For each re-opening, a TAC will be set, based on survey estimates (corrected for catchability) of harvestable biomass and, for most blocks, a target fishing mortality rate calculated as a “synthetic” FOY. Some blocks may have a lower allowable mortality rate while “black” blocks do not re-open. The biomass estimates will include scallops in all blocks immediately adjacent to the re-opening, provided that they will be open in the coming year. Such blocks will then be subject to the same TAC control as those in the re-opened area.

10. The TAC will be allocated [by one of the alternative allocation methods being separately considered for Amendment 10].
11. Separate TAC management for re-opened areas will continue for [a sufficient period to reduce catch rates within the area to approximate equality with those outside – such period being presently estimated at one to two fishing years].

Rationale : Although this is the most complicated (and probably most costly to administer) area rotation alternative, it is intended to produce the highest benefits by protecting small scallops during their highest growth rates, and more accurately determine areas that should be closed. Improvements in yield and fishing efficiency, compared with fixed boundary area rotation alternatives, will result from temporal and geographic heterogeneities in age structure, growth, and recruitment that may not be captured by other alternatives.

The higher potential biomass growth rate criteria, compared to the other alternatives is believed to be warranted because the adaptive boundaries and frequent surveys will be able to earlier and better identify the concentrations of small scallops. As a result, the more dynamic and adaptive approach would better conserve smaller and faster growing scallops than an annual review process with fixed boundaries.

Probable short-term consequences

The short-term results of this strategy are impossible to predict, because the detailed information needed to define closures at this level are presently unavailable, except for some select areas where video surveys have been done recently. As a result, a new data collection and monitoring plan, using industry vessels with standard gear or bottom video cameras, would probably delay area rotation closures.

Over the long term, estimates indicate that the improvement in yield will be about 0 to 5 percent above the performance of adaptive rotation with fixed boundaries.

5.3.2.7 Area based management –with area-specific fishing mortality targets without formal area rotation

Similar to other fixed-boundary area rotation alternatives, The range of the scallop resource would be divided into management areas based on recruitment patterns and historical scallop fishing effort. Vessels would receive area-specific effort (trips, days, etc.) allocations (Section 5.3.3) to reduce localized overfishing, taking into account area-specific differences (where known) in growth and mortality rates, at a scale that is consistent with fishing and historic recruitment patterns, possibly the same as the fixed boundary areas that were used to evaluate area rotation alternatives. Except under unusual circumstances, there would be no area closures to protect small scallops and there would be no formal area rotation system.

Closed areas, HAPCs, MPAs, and other possible zoning restriction are layers that affect scallop management opportunities but not the delineation of scallop areas. In the future, scallop areas could be subdivided into primary and secondary (marginal) scalloping grounds, closed seed beds, scallop HAPCs (if any), scallop enhancement areas (rotational management of seeded areas), etc.

Because limited access vessels would receive area-specific days, voluntary participation in a trading day-at-sea mechanism (Section 5.3.3.3) would be necessary to efficiently use the day-at-sea allocations. Due to the absence of unrestricted fishing areas in this proposal, special consideration must be given to vessels with general category scallop permits that occasionally target sea scallops (Section

5.3.6). Catches (or expected catches) in each area by vessels with general category permits would be counted against the day-at-sea or trip allocations for the limited access vessels, so that the area-specific mortality targets are achieved.

Rationale: This proposal capitalizes on heterogeneities within the scallop resource in order to increase yield and economic returns without a formal closed area policy. Differences in scallop productivity and ecology throughout the Northeast shelf most likely result in **localized overfishing**, which would be significantly reduced by the area-specific fishing mortality controls. This alternative relies more on area-specific allocations to prevent targeting of strong year classes, rather than area closures based on surveys.

Historical recruitment patterns and traditional fishing areas would be used to delineate scallop beds for separate area management. Each area could be fine-tuned in the future (e.g., closed seed beds). Area-specific harvest rates are set annually on the basis of long run sustainability and then adjusted to accommodate competing demands in each area such as EFH, bycatch, and closures by other fisheries (e.g., DAS/TAC reductions, gear restrictions, bycatch quotas, land bycatch, other management closures or MPAs). Foregone scallop yield is measured as a cost of such adjustments.

The area basis will require a mechanism such as trading individual area allocations or block allocations that allows each fisherman to select where he prefers to fish for scallops. Management costs (survey, administration, enforcement) would increase above current levels to continuously monitor the resource on a more detailed scale of resolution.

Probable short-term consequences

Area-specific fishing mortality targets would be established at $F=0.20$ in all areas, until new information about scallop biology indicates that faster local growth or higher local mortality rates indicate a higher fishing mortality target, or vice versa. Vessels would receive area-specific effort allocations and would be allowed to trade them on a one-for-one basis before the start of the fishing year.

Over the short term, the total TAC and day-at-sea allocations would be about 20% higher than with area rotation closures (40% higher if there is no access to the Georges Bank closed areas, but would not protect small scallops as well. Over the long term, area rotation can be more effective to increase yield and day-at-sea allocations.

5.3.2.8 Georges Bank access to groundfish closed areas

Portions or all of the four groundfish closed areas (see map of the Western Gulf of Maine area, Nantucket Lightship Area, Closed Area I, and Closed Area II) may be open for scallop fishing on a periodic basis, either as part of a rotation strategy (e.g.. one area open under an annual access program), according to a reservoir approach (where scallop fishing would occur when the expected landings from other areas declined below a long-term average level), or as a regular rotation management area using time-averaged mortality and ramped annual targets described in Section 3.4.1.

Three area boundary/access options are proposed under this alternative:

1. No access (Map 14)
2. Access alternative 1: Mechanical rotation of areas opened by Framework Adjustment 13 (Map 13), Nantucket Lightship Area and Closed Area I TACs derived from $F=0.4$ target, Closed Area II TACs derived from $F=0.2$ target.

3. Access alternative 2: Southern part of Closed Area II only, TAC derived from F=0.2 target (refer to Map 13).
4. Access alternative 3: Continuous access to portions of the Nantucket Lightship Area, Closed Area I, and Closed Area II (Map 13), TAC derived from F=0.2 target.
5. Access alternative 4: All non-HAPC areas (Map 12)

Should the groundfish closed areas be modified, the above rotation scheme would also need to be modified to be in conformity to it. If some portion of the current groundfish closed areas become open to bottom trawling and dredging, then these areas will be treated like a reopened scallop closure area (see rotation area classifications above), where catches as a “re-opened” rotation management area will be controlled for several years by a TAC, day-at-sea allocations, or trips with possession limits and day-at-sea tradeoffs.

Scallop dredging would be prohibited indefinitely in certain portions of the closed areas that are judged to be especially important to groundfish stocks and/or especially sensitive to dredging. The cod HAPC area is one likely candidate for such a designation.

Mechanical rotation option

With a rotation approach, one of the three groundfish closed areas (or portions thereof) would be open to scalloping each year. It is anticipated that a fairly regular rotation would be used, but the order of rotation could be altered due to changing resource conditions (e.g., recruitment events). Such a rotation may give some yield-per-recruit advantage. For example, it is likely that the initial rotation will start with the Nantucket Lightship Area, which has the largest average sized scallops, followed by Closed Area I, and finally Closed Area II (south), which currently has many small rapidly growing scallops for which delaying harvest would be beneficial. Having only one area open each year would also simplify administration and enforcement issues. In the year before it is fished, an area would be intensively surveyed by one or more fishing vessels, from which a TAC could be determined. Optimal fishing mortality in an area that is open once every three years is about $F = 0.7$, or about a 50% exploitation rate. Experience (and logic) has shown that bycatch and bottom contact time increase as an area gets depleted. This could be avoided by slightly “underfishing” the area, i.e., fishing at an exploitation rate of less than 50%.

Reservoir management option

With a reservoir approach, one or more areas would be open to fishing only when the expected landings from other open fishing areas declines below a threshold, perhaps representing a long-term average. The scallop TAC from the groundfish closed areas would be less (or zero) when yields are high outside the closed areas, and more when yields are lower. Exploitation rates in the area that is open could vary between zero and 50%, depending on conditions.

Regular rotation management area policy

A third option is to treat the portions of the Georges Bank areas where periodic scallop fishing is permitted according to the rotation management area rules described in Section 5.3.2.8. All portions that are not subject to long-term scallop fishing closures would be evaluated with respect to its potential biological growth rate and maximum amount of scallop area closures. If re-opened to scallop fishing, the annual mortality target would be set based on a time-averaged mortality rate since the areas were closed to scallop fishing in 1994, or eventually since the most recent closure according to the time-averaging policy in the proposed overfishing definition (Section 3.4.1). The Council might classify these areas as “re-opened” for longer than normal or adjust the annual mortality ramped strategy, but otherwise as a

transition strategy there would be no different treatment of the accessible portions of the Georges Bank groundfish closed areas.

Rationale : Over the short term, scallop biomass in the groundfish closed areas is about 50 percent of the entire resource and due to the large size of scallops, offers an opportunity to reduce mortality and promote rebuilding elsewhere, while also reducing the number of used days and swept area by commercial fishing gear. Depending on where the reductions in fishing time occur, the action could also reduce bycatch and habitat impacts. The effects would vary by species and bottom type, but with the exception of the Western Gulf of Maine area, the groundfish closed areas were chosen to protect spawning activity and concentrations of spawning cod and haddock. Other species, like flounders and monkfish, are more vulnerable to the gear as scallop bycatch and occur in areas that are presently open to fishing. There also appear to be as many or more valuable habitats in other areas where scallop fishing occurs, compared to some areas within the groundfish closed areas.

Scallops in these areas may still contribute to future yield by spawning, and would serve as a useful control for scientific research. Because gravel and sand habitats are often interwoven, and prime scallop areas are often associated with gravel bottom, it would not be appropriate to close all areas containing some gravel bottom. As the current scallop biomass in the closed areas is estimated to be about 80,000 mt, excellent sustainable scallop yields can be obtained from the remaining areas even if one quarter of the biomass was unavailable. According to the 2000 survey, the northern portion of Closed Area II, including the cod HAPC, contains less than 8% of the total scallop biomass in all of the groundfish closed areas.

Eventually, the Sea Scallop FMP should treat the accessible portions of the Georges Bank groundfish closures as part of a regular rotation management area system. A mechanical rotation or reservoir strategy could perpetuate the current imbalance in the scallop resource where it might be unnecessary over the long term. Including the accessible portions in the regular area rotation management system would allow a quicker transition to a more normal resource distribution. A longer classification as a “re-opened” rotation management area and/or a steeper annual mortality target ramping strategy could ameliorate the spike in landings that would occur with application of the general rules (Section 5.3.2) for area rotation management.

Probable short-term consequences

At a target F ($F=0.20$), access to all three groundfish closed areas (area access alternative 3) could increase yield to 22,930 mt in 2004 and 20,581 mt in 2005 (Table 27), or nearly double the yield that can be taken from all other open scallop fishing areas. Although the preferred alternative (area access alternative 1) only opens portions of the Nantucket Lightship Area and Closed Area I, the projected yield is 15,870 mt in 2004 and rises to 20,733 mt when those areas close and the southern part of Closed Area II would re-open to fishing in 2004. These two area access alternatives would keep the remaining portions of the Georges Bank groundfish areas closed to scallop fishing, where landings would rise to 26,958 mt in 2004 and 24,304 mt in 2005.

The day-at-sea use to catch these scallops would be only about equal to the days-at-sea for all other open fishing areas, due to the high catch rates (about 2,400 to 2,800 pounds per day) in the areas under consideration for controlled access. For area access alternative 1, the day-at-sea use would be about 14,000 days in 2004, rising to 17,000 days in 2005-2007 (Table 27). In contrast, the day-at-sea use would rise to around 20,000 to 22,000 days if all but the HAPC area were open to scallop fishing under area access alternative 4.

In contrast, taking no action would result in day-at-sea use about 8,000 to 9,000 days (Table 27). Status quo, i.e. achieving a target $F=0.20$ with no access would allow day-at-sea use to rise to around 11,000 to 14,000 days. These are also compared to 2002 day-at-sea use based projections, where day-at-sea use would be about 29,000 days. In this case, landings would be about 23,000 mt in 2004, declining to about 17,000 mt in 2007. Allocated days-at-sea would be approximately 33% higher than those in Table 27, to account for allocations that are not used by inactive vessels and allocations to Confirmation of Permit Histories and are not fished by a vessel.

In Amendment 10, the collateral impacts on bycatch and habitat would be mitigated by the effort shift that reduces fishing effort in areas that also have varying amounts of bycatch and habitat impacts. In addition, Amendment 10 also contemplates a new set of habitat closure areas which may more effectively limit impacts on sensitive and complex habitat that is vulnerable to scallop fishing (See Section 5.3). Overall, however, the total area swept (Table 27) for the area access alternatives is about 2,500 nm² for the preferred alternative (area access alternative 1), compared to 1,200 to 1,400 nm² for no action, 2,000 to 2,500 nm² for the status quo, and 7,400 to 9,500 nm² with a status quo policy of allocating 120 days to full-time limited access scallop vessels.

Table 27. Summary of short term effects of area access alternatives.

Rotation alternative	Closed area access alternative	Fishing year	Total landings (mt)	Limited access day-at-sea use.	Average meat count.	Limited access fleet area swept (nm²)
Area rotation	Area access alternative 1	2004	15,870	14,057	15.1	2,459
		2005	20,733	17,663	14.2	2,488
		2006	19,925	17,406	14.3	2,803
		2007	21,198	17,713	14.6	2,001
	Area access alternative 2	2004	21,225	18,276	14.8	2,415
		2005	19,108	16,511	14.5	2,486
		2006	18,550	16,465	14.7	2,801
		2007	20,080	16,969	15.0	1,999
	Area access alternative 3	2004	22,930	19,539	14.5	2,544
		2005	20,581	17,627	14.2	2,614
		2006	19,847	17,474	14.4	2,928
		2007	21,248	17,900	14.8	2,125
No action	Area access alternative 4	2004	26,958	22,856	14.3	2,992
		2005	24,304	20,752	14.1	3,061
		2006	23,356	20,470	14.3	3,374
		2007	24,604	20,808	14.6	2,570
	No access	2004	12,757	11,696	16.3	2,172
		2005	11,055	10,371	16.5	2,239
		2006	11,079	10,791	16.9	2,553
		2007	13,149	11,692	17.0	1,751
	No access	2004	9,360	7,963	16.5	1,240
		2005	9,342	7,989	16.5	1,276
		2006	10,416	8,963	16.5	1,420
		2007	10,521	8,979	16.4	1,390
Status quo (F=0.20)	No access	2004	15,247	14,444	17.1	2,524
		2005	14,895	14,106	17.1	2,597
		2006	12,659	12,248	17.8	2,378
		2007	11,186	10,518	17.9	1,979
	No access	2004	23,000	28,983	18.8	7,389
2002 day-at-sea use	No access	2005	19,993	28,337	19.3	7,907
		2006	16,448	28,139	21.3	8,859
		2007	16,734	28,798	22.5	9,469

Over the short-term, the preferred alternative (area access alternative 1) would produce total economic benefits that are 82 percent of the maximum if all areas but the HAPC were open to fishing (area access alternative 4). Compared to no action, the total economic benefits of area access alternative 1 increase by 72 percent (Table 28), an increase of 33 percent compared to the status quo without access and even increases total benefits by 8 percent with 2002 day-at-sea use and no access. Habitat closures would, of course reduce the economic benefits from these area access alternatives if there were substantial overlap between the two.

Because of the cost savings associated with reduced fishing time to harvest optimum yield, the area access alternatives provide greater producer surplus than taking no action, adopting the status quo, and even continuing with 2002 day-at-sea allocations (Table 28). Producer surplus (most of which accrue to vessel owners and crew) would be 95 percent of the maximum with all areas open (area access alternative 4) and 38 percent higher than taking no action.

Table 28. Summary of short-term economic effects of proposed area access alternatives.

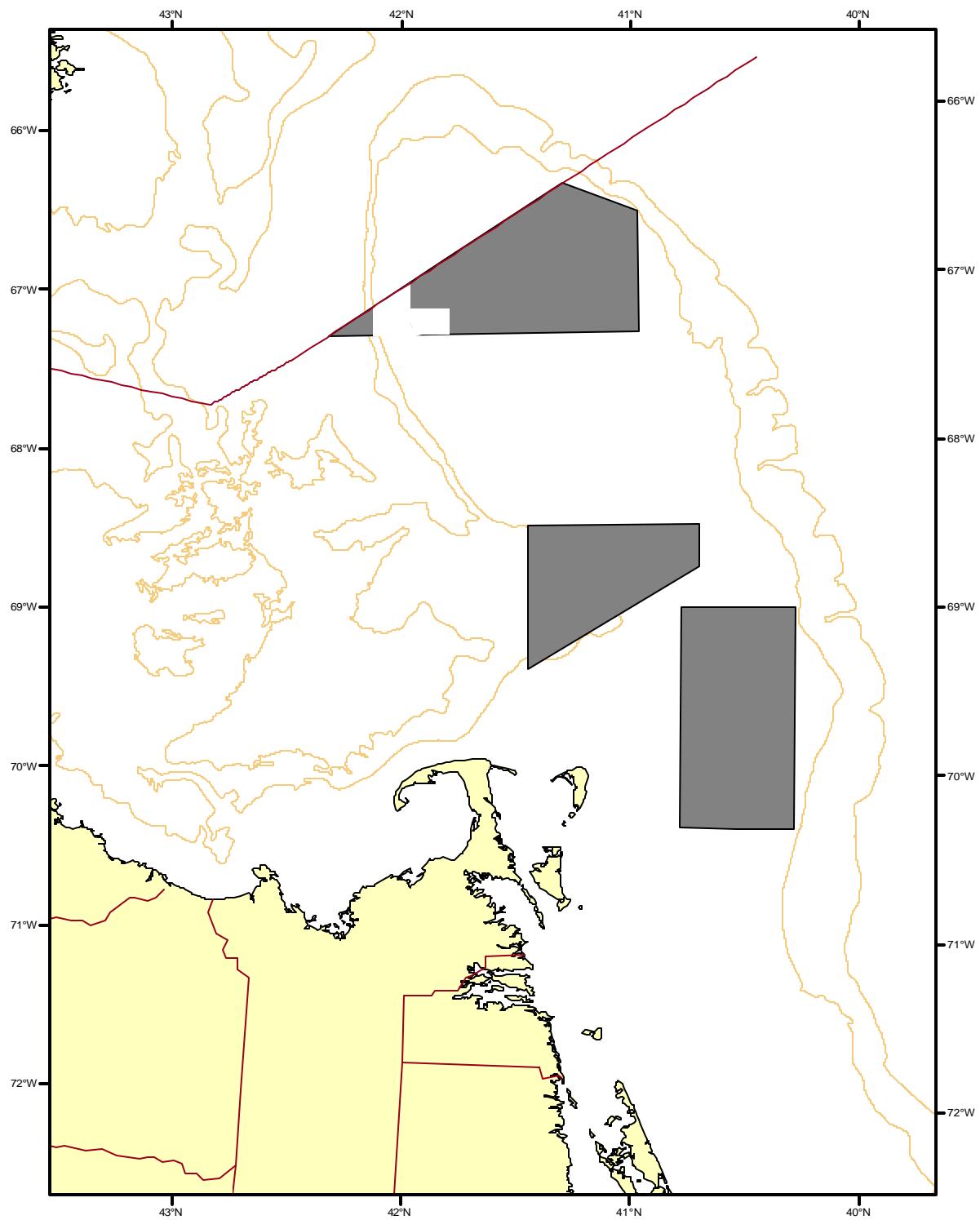
Alternatives	Total Economic Benefits 2004-2007²⁵	Producer Surplus 2004-2007²⁶
Area access alternative 1	768	505
Area access alternative 2	783	511
Area access alternative 3	826	520
Area access alternative 4	929	532
No Access	522	407
No Action, No Access	446	365
Status quo: No Rotation, F=0.2, no access	577	432
2002 DAS use – no access	710	446

Over the long term, scallop productivity within the Georges Bank groundfish closed areas would be about 33 percent of the total for the entire EEZ. Total long term yield from all of the Georges Bank closed areas is about 8,500 mt.

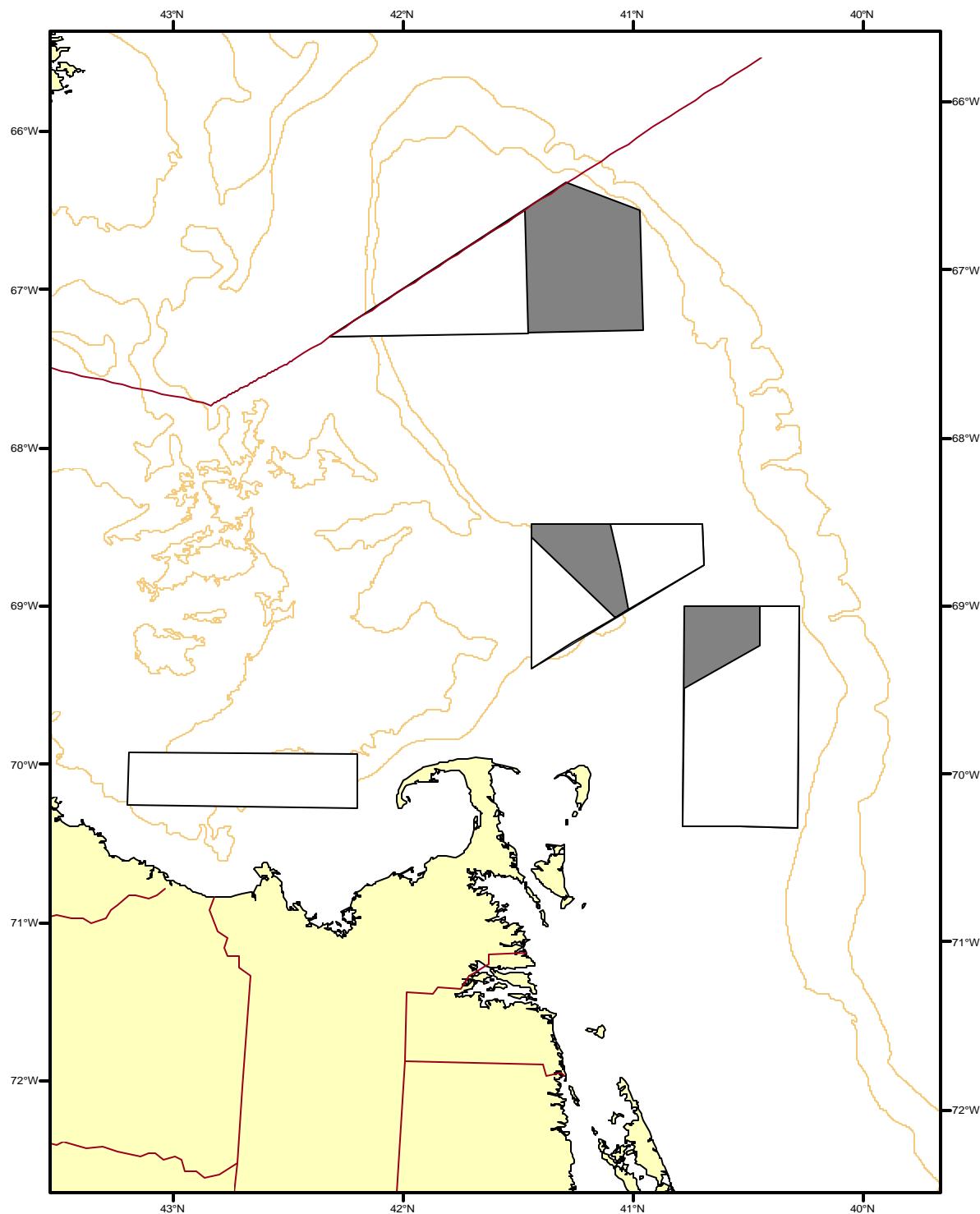
Considering the current status of the resource, the best scallop yield for the Framework 13 areas would be if portions of Closed Area I and the Nantucket Lightship Area open for fishing in 2004, followed by a two (possibly even three) year closure while Closed Area II South opened in 2005 and 2006. Scallops in Closed Area I and the Nantucket Lightship Area were lightly fished in 2000, following a six year closure and the average scallop size remains large. Closed Area II, on the other hand, has had an access program in 1999 and 2000, while a near-record year class appeared there in 2000. Scallop biomass in Closed Area II is expected to increase by 19% during 2003, compared to a decline of 2% in Closed Area I and the Nantucket Lightship Area, assuming that all areas would be closed in 2003.

25 Consumer and producer surplus: Cumulative discounted values for 2004-2007 in 1996 dollars.

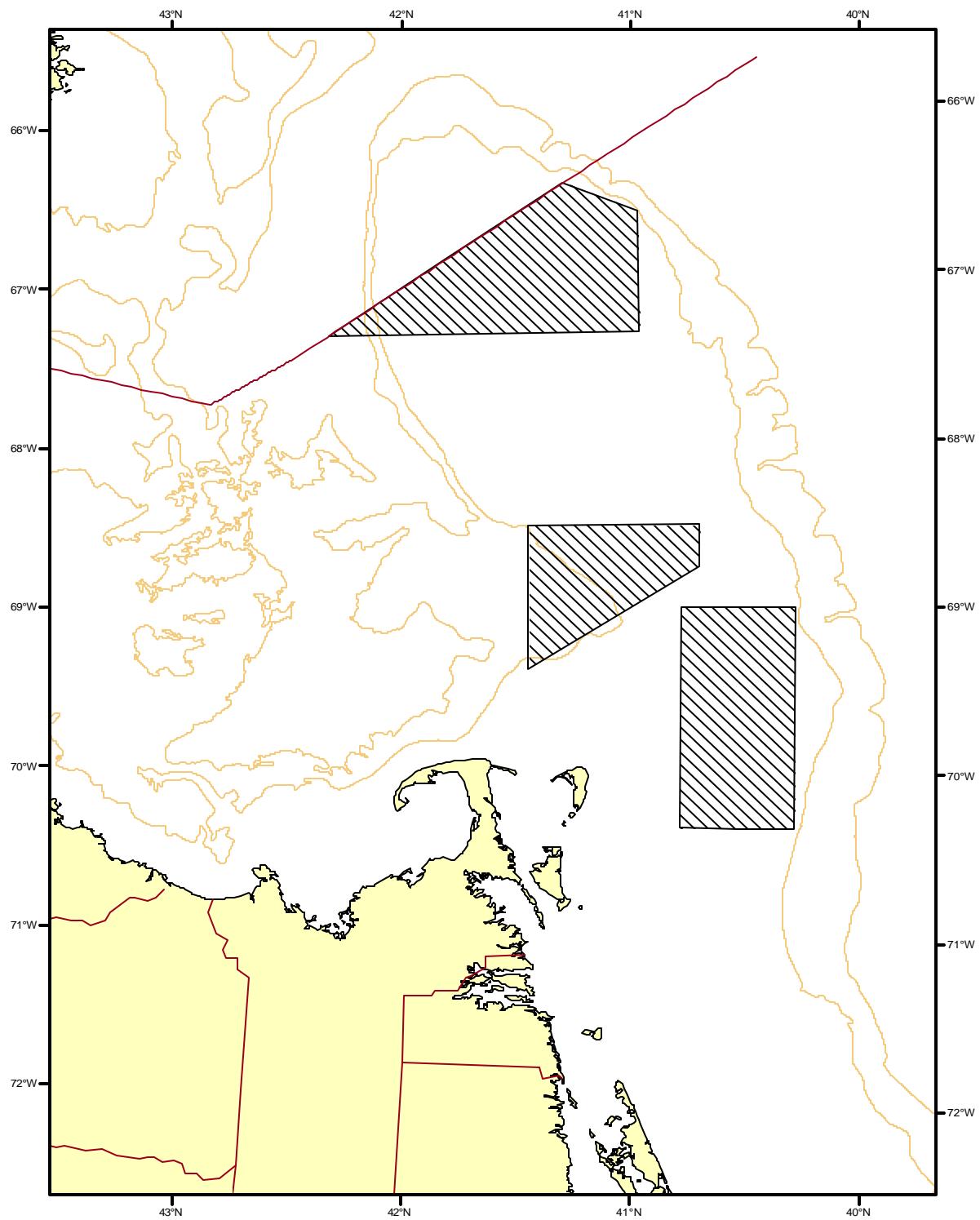
26 Cumulative discounted values for 2004-2007 in 1996 dollars.



Map 12. Location of scallop fishing areas for an access option that would sometimes re-open all but habitat areas of particular concern. The areas that would potentially open for scallop fishing are shown as shaded portions of the Georges Bank groundfish closed areas.



Map 13. Location of scallop fishing areas for an access option that would sometimes re-open portions of the groundfish closed areas that were opened to fishing in 2000. The areas that would potentially open for scallop fishing are shown as shaded portions of the Georges Bank groundfish closed areas.



Map 14. Areas (hatched) that would remain closed for an alternative that would re-open no part of the Georges Bank groundfish closed areas.

5.3.2.9 Increasing the minimum ring size to 4-inches in all or select areas

Scallop dredges would be required to be constructed with 4-inch rings, increasing from 3-½ inches. One option would make this a requirement everywhere and second option would make it a requirement for areas in a ‘re-opened’ status, including the groundfish closed areas if an access program (Section 5.1.3.1) is active.

Vessels would have the option of using dredges constructed with 3 ½ inch rings in open rotation areas for one year after implementation of Amendment 10 regulations. Six months after implementation of Amendment 10, vessels must use dredges with 4-inch rings on re-opened area trips, including authorized trips in the Georges Bank groundfish closed areas.

Rationale : Larger rings allow more small scallops (70-110 mm) to escape capture. This has some benefit to reducing discard mortality²⁷ and improving yield. Just as important however, is that gear efficiency for large scallops increases, thereby reducing tow time to catch a possession limit or an amount that the crew can shuck.

The smaller tow durations reduce the total area swept, non-catch mortality of sea scallops, the amount of bycatch, and habitat effects in almost equal proportion. Reducing non-catch mortality per scallop landed and reducing the discard rate (even when low) both contribute scallop survival and yield improvement.

The one exception to this outcome is when few large scallops (greater than 110 mm) exist in areas that are open to fishing. In this case, tow times for the 4-inch dredge can increase because it is less able to catch the intermediate size scallops. The gear’s catch rate declines below the crew’s shucking capability and/or it takes more fishing to achieve a possession limit. Requiring 4-inch rings only in re-opened areas and the groundfish closed areas would ensure the gear was used where there are sufficient large scallops to cause a decline to tow time.

Implementation of this measure would be delayed by up to a year to allow suppliers to manufacture or obtain the larger rings. It would also allow suppliers to draw down existing gear inventory and allow fishermen time to use gear purchased before Amendment 10 is implemented. Full-time vessels replace dredge bags about once per year, although this varies from vessel to vessel depending on the amount and location of fishing activity.

No additional alternatives for increasing the minimum ring size in scallop dredges from 3.5 inches were considered because no information exists to determine what other ring size may be effective in improving scallop yield.

Probable short-term consequences

If applied throughout the resource, the target TAC and annual day-at-sea allocations would be slightly less than those when a 3-½ ring would be required, but mortality on small scallops would decline and in a few years, the annual TAC and day-at-sea allocations would be higher than if a 3-½ ring were required. Not unlike some other gears, the efficiency of catching the target sizes using the larger rings

²⁷ Discard mortality of sea scallops is low under most conditions, so increasing selectivity has a small benefit to those scallops that are sometimes crushed on deck while the catch is handled and sorted.

increases by about 10-15 percent. The larger sizes of scallops allow the crew to shuck more pounds of scallop per day (i.e. LPUE increases) and the days associated with the target mortality rate declines, because of the higher gear efficiency with larger rings (Section 8.2.8).

5.3.2.10 Gear specific day-at-sea allocation adjustments based on equal mortality per day-at-sea

Vessels authorized to use trawls would receive day-at-sea allocations in proportion to the number of scallops landed per day-at-sea, compared to vessels using dredges. Initially the gear-specific day-at-sea allocations would be determined with existing data, but the gear-specific day-at-sea allocations could change by framework adjustment as new data become available, or the performance of the fleet using (possibly redesigned) dredges or trawls changes. Owners may permanently convert a trawl-authorized limited access permit to a dredge-only permit and would receive an allocation associated with a dredge-only permit for a vessel's permit category. A vessel with a trawl-only limited access scallop permit could also convert to a small-dredge permit and qualify for the next higher limited access category.

Rationale : Day-at-sea allocations are one of the most important elements of the Scallop FMP to control fishing effort and mortality. It was originally known that vessels using trawls were more effective when small scallops are available, but the size distribution of the catches were similar because there were fewer large scallops available in the 1990's.

Since mortality has declined and the resource has recovered, a day-at-sea on a dredge vessel produces less mortality per day-at-sea than it used to because the dredge is more effective than trawls at catching large scallops and the number caught and landed is less. Crew limits and day-at-sea allocations promote fishing with dredges in areas that have larger scallops now that they are more available than in the past. Trawls, on the other hand, are more effective at catching smaller scallops that swim (i.e. "clap") and are captured by the higher profile and wider trawls. Crew requirements to handle trawl gear are also less, due to longer tow times and other factors. Since the trawls are less effective on large scallops, the scallop trawl fishermen tend to continue targeting concentrations of smaller scallops, even though large scallops are present in fishing areas but are less available to the gear.

Probable short-term consequences

Analysis of landings data from 1998 to 2000 (Section 7.1.1.1.2), when the count of landed scallops has been recorded, trawl vessels have landed about a third more scallops in number per day-at-sea than do dredge vessels from the same three digit areas and time of year. Trawl vessels would therefore receive 75% of the days-at-sea allocated to dredge vessels to equalize the annual mortality associated with a trawl and dredge limited access permit.

5.3.2.11 No action alternative

The no action alternative with regard to area rotation is the Amendment 7 regulations, accounting for the sunset of applicable area and day-at-sea regulations in Framework Adjustment 14. The no action alternative includes no additional closures; Amendment 7 day-at-sea allocations; and Georges Bank areas remain closed until changed in Multispecies FMP. Vessels would continue to use 3 ½ inch rings and vessels using trawl and dredge gears would be allocated an equal number of days-at-sea, consistent with their full-time, part-time, or occasional limited access permit.

Rationale : This is the no action alternative with respect to area rotation, because Amendment 7 does not have any closures scheduled to take place, and no regulations would be in place to supercede the groundfish area closures on Georges Bank and in the Gulf of Maine.

5.3.2.12 Status quo alternative

The status quo alternative are those management measures that are likely to transpire by framework action under Amendment 7 regulations, including re-specifying the day-at-sea allocations to achieve the Amendment 7 fishing mortality objective and/or ad hoc area closures to protect small scallops. The no action alternative includes ad hoc area closures; day-at-sea adjustments to achieve annual mortality target; Georges Bank areas remain closed until changed in Multispecies FMP. Vessels would continue to use 3 ½ inch rings and vessels using trawl and dredge gears would be allocated an equal number of days-at-sea, consistent with their full-time, part-time, or occasional limited access permit.

Rationale : This is the status quo alternative with respect to area rotation, because Amendment 7 allows framework adjustments to create ad hoc closed areas for protection of strong year classes and annual day-at-sea adjustments to achieve the fishing mortality targets

5.3.3 Alternatives for Allocating Effort

Amendment 10 does not propose to change the method for controlling fishing effort or catch, but certain modifications to the day-at-sea allocations are necessary to accommodate area-based management, including area rotation. Two methods are proposed for allocating area-specific effort and catch controls, area-specific day-at-sea allocations or trip allocations with possession limits and day-at-sea tradeoffs. Limited access vessels would receive equal area-specific allocations, consistent with the effort limits for their full-time, part-time, or occasional permit. General category vessels are not allocated fishing effort, but would fish under a restrictive possession limit and an area specific TAC for recently re-opened rotation areas.

Both effort allocation methods would require a TAC estimate, based on Albatross and/or cooperative industry survey data, for recently re -opened rotation areas . Effort and catch management in the remaining open fishing areas would continue under current rules, i.e. limited access scallop vessels would receive an annual day-at-sea allocation to fish anywhere an area is open to regular scallop fishing (see Table 11).

A third allocation mechanism, one-to-one trading, is needed to allow fishermen to better utilize their area-specific allocations. A procedure would allow vessels with limited access scallop permits to trade area-specific allocations with another limited access vessel. A vessel from Gloucester, MA, for example, might trade days or trips in the Mid-Atlantic for days or trips in a Georges Bank area that were originally allocated to a vessel from Hampton, VA.

Effort allocations, whether in open or recently re-opened areas, are calculated using estimates of the TAC, the landings per day-at-sea, the number of active permits²⁸, and their expected use of allocated days²⁹. Area-specific and open area TACs are estimated by projecting the exploitable biomass based on the most recent survey, and calculating the catch using the catch equation (projection methods are

28 Inactive permits do not contribute to fishing mortality.

29 Unused day-at-sea allocations do not contribute to fishing mortality.

described in Section 8.2.1), after taking into account commercial dredge efficiency³⁰, size selectivity of the gear and crew (cull), discard mortality³¹, and non-catch mortality³².

Annual target fishing mortality rates for re -opened areas based on time -averaging

The target fishing mortality in the open areas is the stock-wide target, 80 percent of F_{max} ($F=0.20$). In re-opened areas, the target fishing mortality is the time-averaged fishing mortality since the beginning of the most recent closure, as a constant annual level or ramped to begin at moderate levels and increase over the duration of the recently re-opened period, as long as the time-averaged fishing mortality does not exceed 80 percent of F_{max} . For example, a three-year closure followed by a three-year recently re-opened status would mean that the target F would be two times F_{max} ($F=0.40$) for the recently re-opened area. In the seventh year, the fishing mortality would decline to the stock-wide target to ensure that the time-averaged mortality does not exceed the stock wide target. Table 29 provides some examples using different closure durations that could result from adaptive rotation and different recently re-opened periods.

Table 29. Constant annual fishing mortality targets for recently re-opened rotation areas and time averaged fishing mortality targets with different closure and recent re-open durations. Calculations assume that the stock-wide target equals 0.20.

Duration of closure (years)	Duration of recently re-opened status			
	2	3	4	5
2	0.40	0.33	0.30	0.28
3	0.50	0.40	0.35	0.32
4	0.60	0.47	0.40	0.36
5	0.70	0.53	0.45	0.40

Increasing or ramped fishing mortality targets for re -opened rotation management areas

Each year, the fishing mortality rate in a re-opened area will be estimated and monitored, allowing for adjustments to the recently re-opened annual fishing mortality target (and TAC) for overages or underages in the previous years. Under a ramped strategy, the first year of the recently re-opened period would have a lower fishing mortality target than subsequent years. For example, the fishing mortality target in the first year of a three-year period would be 80% of the time-averaged target (or $F=0.32$), 100% of the time-averaged target (or $F=0.40$) in the second year, and 120% of the time-averaged target (or $F=0.48$) in the third year. Table 30 provides some examples using a ramping strategy that begins with 80% and ends with 120% of the time-averaged target and different recently re-opened periods. The ramping strategy could be steeper or less steep depending on conditions and the anticipated schedule for re-opening other closed rotation areas, so that the Council may stabilize and optimize the annual day-at-sea allocations and expected landings.

Table 30. Ramped annual fishing mortality targets for recently re-opened rotation areas and time-averaged fishing mortality targets, after a three-year closure. The example ramping strategy

30 50 percent in the Georges Bank region and 70 percent in the Mid-Atlantic region (NEFMC 2001).

31 Estimated to be 10 percent of the catch.

32 Estimated to be 10 percent of the catch on Georges Bank and 3 percent of the catch in the Mid-Atlantic, based on the results of Caddy (1975) and Murawski and Serchuck (1989).

begins with 80% and ends with 120% of the time-averaged target, assuming that the stock-wide target equals 0.20.

Year after re-opening	Duration of recently re-opened status			
	2	3	4	5
1	0.40	0.32	0.28	0.26
2	0.60	0.40	0.33	0.29
3	0.20	0.48	0.37	0.32
4	0.20	0.20	0.42	0.35
5	0.20	0.20	0.20	0.38

Probable short-term consequences

See Section 8.xxx for estimates of day-at-sea allocations, TACs and trip allocations for controlled access areas, and the effect of day-at-sea tradeoffs based on projected daily catch rates.

5.3.3.1 Individual day-at-sea allocations by management area

Instead of allocating total days-at-sea to limited access vessels to fish throughout the stock areas, some areas in a recently re-opened status would have day-at-sea designated for that use only. In lieu of a hard TAC or quota, limited access vessels would receive annual days-at-sea to fish in specific recently re-opened areas when they are open to fishing. The vessels would also receive annual days-at-sea to fish in open (i.e. non-restricted) scallop fishing areas. The number of days each vessel receives for each area would be based on the following factors:

- The vessels limited access permit category (i.e. full-time, part-time, occasional, dredge-only, trawl authorized)
- The number of active permits
- The proportion of days used by each permit category
- The target TAC for re-opened or open fishing areas, and
- The expected average catch per day-at-sea by area.

Rationale : Area-specific day-at-sea allocations allow greater flexibility for vessels to determine how and when they will fish in a re-opened area. Unlike the other alternative, vessels that return to port early do not risk loosing extra days, despite their inability to land a possession limit on a trip.

Area-specific day-at-sea allocations also easier to administer. They do not require managers to estimate a viable choice of possession limits and day-at-sea tradeoffs. If a possession limit were too low for the day-at-sea tradeoff, then fewer vessels would fish in a re-opened area. Conversely, if a possession limit is too high for the day-at-sea tradeoff, the area would be fished using fewer days off the clock and fishing mortality in the other open areas would be too high. Area-specific days-at-sea could also be monitored with existing VMS equipment, without tracking trips taken and monitoring compliance with a possession limit.

Primary harvest control	Advantages	Disadvantages
Area-specific day-at-sea allocations	<ul style="list-style-type: none"> ❖ Successful fishermen can increase gross profits ❖ May be self-correcting with regard to uncertainty in the biomass estimate (i.e. LPUE changes if the estimate is too high or low) ❖ Easy to enforce with VMS or call-in ❖ Except for shucking scallops off the clock, avoiding compliance is difficult 	<ul style="list-style-type: none"> ❖ Requires assumptions about annual catchability and day-at-sea use ❖ Requires controls on fishing power or adjustments when fishing power increases from new technology or vessel improvements ❖ Difficult to adjust since the relationship between fishing mortality and day-at-sea allocations has low precision ❖ Downward adjustments difficult because need to reduce becomes apparent when catch rates are low, thereby increasing short-term economic hardship.

Probable short-term consequences

Vessels would receive the expected days to catch the possession limit, totaled over the number of trips allocated for each areas. Thus, the total number of days allocated would be those given in Sections 8.2.3³³, without the effect of the added days for the day-at-sea tradeoff, but about 7 of those days would be for fishing in the Nantucket Lightship Area and Closed Area I, and about 25 days would be for fishing in the Hudson Canyon Area in 2004. The remaining fishing days would be available for fishing in other open fishing areas.

5.3.3.2 Area-specific trip allocations with possession limits and day-at-sea tradeoffs

Similar to the present management of the Hudson Canyon and VA/NC scallop areas (NEFMC 2001), vessels with limited access scallop permits would be authorized to take up to a specific number of trips into re-opened rotation management areas. These trips would have a possession limit and an automatic day-at-sea charge or ‘tradeoff’ for any declared trip to a re-opened area. Vessels that legally transit re-opened areas would not be charged a day-at-sea tradeoff. The trip allocation may apply to one or more areas, either combined or allocated to each re-opened area in a fishing year. It would be more likely if the allocations are combined (like they were in 2001 and 2002 for the Hudson Canyon and VA/NC area access program), if the scallop resources in the two or more areas are similar enough that it doesn’t matter how much fishing effort targeted each area individually (up to the applicable TAC for each area).

Either the day-at-sea tradeoff or the possession limit for trips in re-opened areas will be held constant. The number of re-opened area trips to be authorized will be the TAC divided by the number of vessels eligible to fish and the possession limit, taking into account the ability for vessels with part-time and occasional permits to take authorized trips subject to their annual day-at-sea allocation. “Banked”

³³ This is a new analysis in the FSEIS that updated Sections 7.2.1.1 and 7.2.3.3 in the DSEIS, including the revised DAS tradeoff and area-specific DAS allocations. The new section may no longer agree with the summary in this summary of short term consequence.

days created from the day-at-sea tradeoff versus the number of days expected for vessels to land the possession limit, will be added to a vessel's annual day-at-sea allocation, to account for the expected day-at-sea tradeoff.³⁴

Vessels would be authorized to take area-specific trips for re-opened rotation areas and would be charged a fixed amount of days, regardless of the actual trip duration. If fewer vessels than expected fish in re-opened areas, the Regional Administrator would be authorized to adjust the number of authorized trips or the possession limit half way through the period when trips are authorized to fish in re-opened areas. This would increase the likelihood that the re-open area TACs would be taken and that fishing mortality in regular, open fishing areas would not be higher than anticipated because vessels chose not to fish in re-opened rotation areas.

Vessels would be able to take authorized re-opened area trips at any time, but the Council may through framework adjustment place seasonal limits on the amount of trips vessels may take in an area, if there is need to prevent derby style fishing reduce bycatch, or prevent gear conflicts.

Rationale : As in past area access programs (NEFMC 1999, NEFMC 2000, NEFMC 2001), fishing effort in re-opened areas could be regulated with trip allocations and possession limits. The number of trips that would be allocated to limited access vessels to fish in re-opened areas, would depend on the TAC for an area, the possession limit chosen by the Council, and the number of vessels that will fish in the area³⁴. Typically, the possession limit would be the product of the days-at-sea accumulated on a re-opened area trip (i.e. a day-at-sea tradeoff) and the average landings per day by the fleet in other open rotation areas, where regular day-at-sea accounting applies. A slightly higher possession limit may be needed to attract fishing effort, although it cannot be so high that vessels cannot land the possession limit in less time than the day-at-sea tradeoff.

Since the catch rates in different re-opened areas may vary (but restrained by the crew's shucking capacity), it will be necessary to either vary the possession limits with a consistent day-at-sea tradeoff, or vary the tradeoff and keep the possession limits constant for all re-opened areas in a fishing year. Otherwise, one re-opened area may be fished heavy while another would receive little fishing effort and fail to achieve the intended benefits of area rotation.

Unlike the current management approach, the day-at-sea allocations for open areas would be calculated to achieve the fishing mortality target for that class of rotation areas. At the present time, scallop mortality in only the open fishing areas is higher than the stock-wide target ($F=0.20$). The day-at-sea tradeoffs associated with area access cause reductions in the available day-at-sea allocations to fish in regular, open fishing areas. Day-at-sea tradeoffs therefore have a positive effect in reducing days (and area swept) in greater amounts than if the area access trips had accounted for only the actual days.

With area specific TACs and management, it is no longer necessary to reduce open area day-at-sea allocations via a day-at-sea tradeoff. Instead, the annual allocation of days-at-sea in open rotation areas would be adjusted to compensate for the expected day-at-sea tradeoffs in the re-opened rotation areas. **In other words, the expected day-at-sea tradeoff (i.e the difference between days used and days charged in re-opened areas) can be treated as 'banked' days and added to the annual allocations in areas that days would be traded to fish in re-opened areas .**

³⁴ As in past actions, the number of vessels that are expected to fish will assume that it equals the number of active limited access permits, accounting for the number of trips and day-at-sea tradeoffs a vessel can count against its annual day-at-sea allocation.

Primary harvest control	Advantages	Disadvantages
Trip allocations with a possession limit	<ul style="list-style-type: none"> ❖ Uses present experience and strategy to manage re-opened areas ❖ Could offer more flexibility if vessels are not obligated to use the trips if they don't also loose allocations elsewhere ❖ Allows for a 'tradeoff' mechanism to reduce effort in other areas in exchange for higher catches in a re-opened area 	<ul style="list-style-type: none"> ❖ Possession limit could be inaccurate, i.e. not achieve desired results, because the catches in other areas are different than what was expected ❖ Possession limits are hard to enforce, especially if multiple possession limits for individual areas are needed or illegal landings occur ❖ Highgrading could increase (scallop discard mortality ~ 10-20%) ❖ Could increase annual trip expenses for vessels that typically have above-average catches ❖ Could discourage participation by vessels that typically have above-average catches if they can fish elsewhere without a possession limit

Probable short-term consequences

The total number of days allocated would be those given in Sections 8.2.3 including the effect of the day-at-sea tradeoffs to add to the total, compensating for the extra fishing effort charged for trips taken in the Nantucket Lightship Area, Closed Area I, Closed Area II, and the Hudson Canyon Area.

5.3.3.3 One-to-one exchanges of area-specific allocations (days-at-sea or trips)

The alternative could apply to area specific day-at-sea allocations (Section 5.3.3.1) or to area-specific trip allocations (Section 5.3.3.2). It would enable vessels with a limited access scallop permit and area-specific allocations to trade them with another limited access scallop vessel for allocations in preferred areas, thus allowing the vessel greater flexibility to choose where to fish without significantly changing the total allocation for any rotation management area. Although vessels that do not use trips allocated for re-opened rotation management areas do not loose the ability to fish elsewhere in a regular fishing area, it would come closer

In addition to regular day-at-sea allocations to fish in open scallop areas, NMFS would allocate area-specific day-at-sea or trip allocations to vessels with limited access scallop permits. These allocations may be for "unrestricted" open-area fishing or could be area specific, depending on the area rotation/management option eventually adopted by the Council and approved by NMFS.

Permit holders could exchange area-specific days-at-sea or re-opened area trips on a one-for-one basis with any other vessel with a limited access scallop permit, but must immediately report the transaction to the NMFS. If the trading takes place during the fishing year, there would be a 30-day waiting period before the recipient vessel could use the traded days or trips, or until the recipient vessel receives notice that NMFS has recorded the exchange. After vessel owners had legally agreed to the exchange, vessels would be prohibited from using area-specific days or trips that were transferred to another vessel.

Vessels could not trade TAC or days that had already been used during the fishing year by the vessel receiving the original allocation, but it could trade TAC or days that had been received by another vessel in an earlier trade. Trades would not be permanent and the vessel would receive its original share and distribution of TAC or days at the start of the next fishing year.

Rationale : This alternative enables vessel owners and captains to decide where to fish and allows more flexibility during the fishing year, allowing them to better utilize their area-specific allocations. This would restore some flexibility in deciding where to fish, which might otherwise be impossible under area rotation where re-opened areas are managed with area-specific days or day-at-sea tradeoffs.

Key benefits	Important costs and other drawbacks
<ul style="list-style-type: none">❖ Vessel owners and captains could have more flexibility to choose where to fish, if there is another vessel that would be willing to trade days or TAC.❖ Changes in total fishing power are only as permanent as the trade arrangements	<ul style="list-style-type: none">❖ Vessel owners would have to report the trades and NMFS would need to track trades and monitor TAC or days-at-sea against the present status❖ The distribution of these allocations could affect fishing power and therefore mortality in each area, adding uncertainty to the estimated area-specific total allocation of days-at-sea or TAC❖ There would have to be a mechanism to prevent vessels from trading days or TAC that had already been used

5.3.3.4 Status quo

This alternative exists to continue the current effort allocation schema without area-specific day-at-sea or trip allocations and tradeoffs, in case area rotation is not implemented. Unrestricted day-at-sea allocations would be made to vessels with limited access scallop permits and may be used to fish in open fishing areas. Additional rules established by framework adjustment may apply to day-at-sea use in one or more special areas.

Rationale : The status quo is incompatible with area rotation or area based management alternatives, but could continue if the Council or NMFS decides not to implement area rotation. There would be no limit (other than total day-at-sea allocations) on the amount of fishing effort directed toward scallops once an area re-opens to fishing. Coupled with area rotation that would periodically open areas with high scallop biomass, it would probably have a negative effect on price, product quality, and safety.

5.3.4 Alternatives for Reducing Habitat Impacts

The following alternatives in Amendment 10 would affect fishing with scallop dredges and trawls only, because the Scallop FMP only regulates scallop fishing or fishing that has an affect on the scallop resource. The intent of the proposed habitat alternatives in Amendment 10 are to minimize the impacts of scallop fishing of EFH for all species which have EFH designated within the range of the scallop fishery.

Although Amendment 10 alternatives apply to only scallop fishing, the effectiveness of the following habitat closure alternatives could be significantly greater if the areas were also closed to other bottom-tending mobile fishing gear, rather than only to scallop fishing. The intent of the proposed habitat

closures in Amendment 10 could soon apply to other bottom-tending mobile fishing gear regulated by this FMP or other FMPs under the Council's authority.

5.3.4.1 No additional habitat-related management measures (Alternative #1: Status Quo / No Action)

This alternative retains the groundfish year-round closed areas in existence during Fishing Year (FY) 2001 prior to the settlement agreement (CLF et al. v. Evans et al.) that serve to protect habitat and minimize the impacts associated with fishing activities (WGOM, CA I, CA II, NLCA)(Map 15). Although not closed specifically to achieve habitat conservation, portions or all of the Georges Bank groundfish closed areas would remain closed for scallop fishing and therefore would have beneficial effects for protecting EFH found there. Like in Framework Adjustments 11 and 13, however, the Council may in the future allow periodic scallop fishing access in parts or possibly all of these areas on an ad hoc basis. If the Council took no future action to allow access the Georges Bank groundfish areas would remain closed.

Under the status quo management, no new measures would be implemented as part of Amendment 10 specifically to protect essential fish habitat or reduce the impacts associated with fishing activities. Significant reductions in day-at-sea allocations, coupled with vast changes in gear restrictions, and crew limits on shucking capacity may have already minimized total area swept and associated habitat impacts to the extent practicable (See cumulative impacts described in Section 8.1). Areas closed to protect other species and HAPCs in other plans could restrict scallop fishing, but no habitat closures would specifically be considered in the Scallop FMP.

Under status quo management, the Council may also adjust the day-at-sea allocations to achieve the annual fishing mortality targets, established as $F = 0.20$ by Amendment 735. If the Council takes no future action to adjust the day-at-sea allocations, however, the allocations would remain as specified under current regulations. The Hudson Canyon and VA/NC area access program could continue under status quo management through future framework actions, but these areas would otherwise revert to a fully-open status on March 1, 2004 if the Council took no action.

5.3.4.2 Benefits of Other Amendment 10 Alternatives (Alternative #2)

There may be some incidental habitat benefits resulting from the measures considered by the Council under Amendment 10. This alternative identifies and assesses the habitat benefits that are attributed to non-habitat-specific measures in Amendment 10 and relies on these benefits to comply with the EFH provisions of the Magnuson-Stevens Act.

Rationale : The Sea Scallop FMP has reduced the amount of total scallop fishing time, through day-at-sea reductions and measures that reduce the amount to fishing associated with an allocated day-at-sea (e.g. crew limits, day-at-sea tradeoffs for controlled access areas). The FMP has also included area closures and gear restrictions that may have had a beneficial effect on EFH, through changes in where vessels fish for scallops and reductions in bycatch of groundfish, other prey fish, and benthic organisms. The sea scallop management alternatives in the amendment have the potential to build on this progress and may also have beneficial effects for reducing habitat impacts.

35 Amendment 7 specifies this as an appropriate target under a rebuilt condition. The NMFS has declared in 2002 that the Georges Bank and Mid-Atlantic scallop resource as rebuilt.

5.3.4.3 Habitat closed areas designed to protect hard-bottom habitats (Alternative #3)

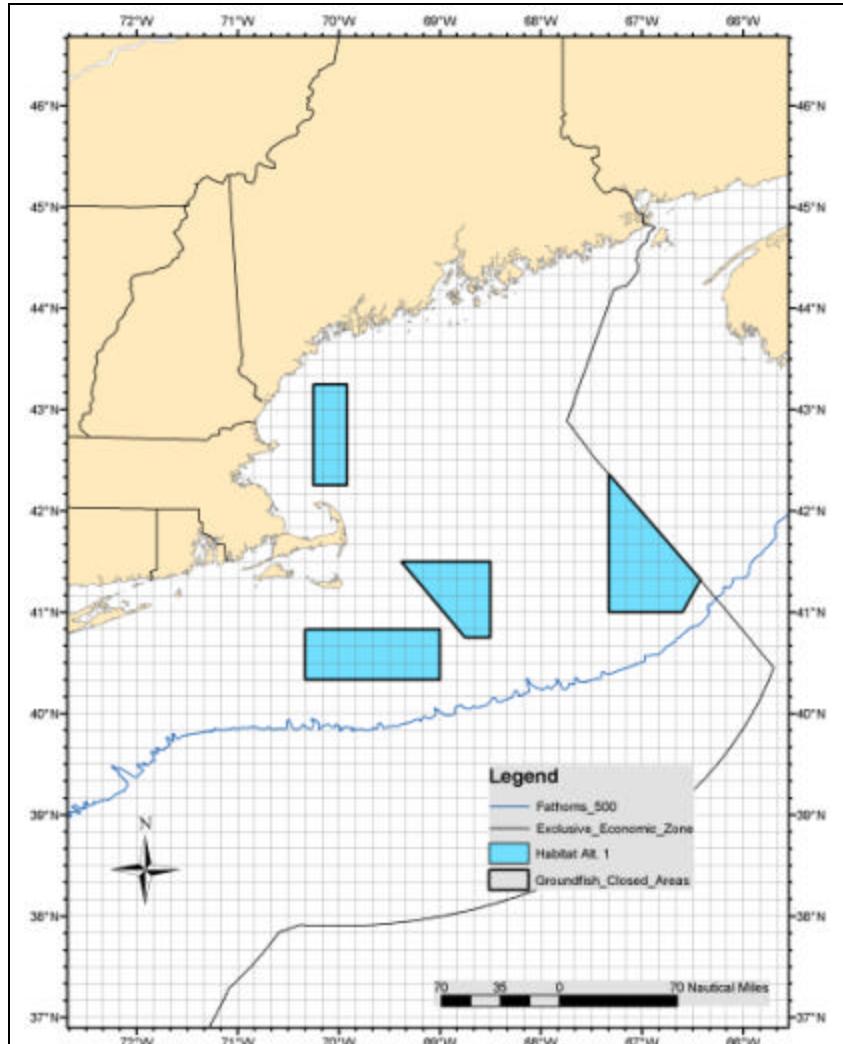
In this alternative, areas both inside and outside of the existing groundfish closures are identified for habitat closure to better protect complex hard-bottom and other sensitive habitats. The Council approved this alternative with two versions of the Western Gulf of Maine closed area. These have been incorporated as two options:

- Alternative 3A, which has a larger extension of the WGOM to the west.
- Alternative 3B, which has a smaller extension of the WGOM closure to the west.

Map 16and Map 17 provide a graphical representation of the proposed habitat closure options and coordinates for the boundaries of those areas.

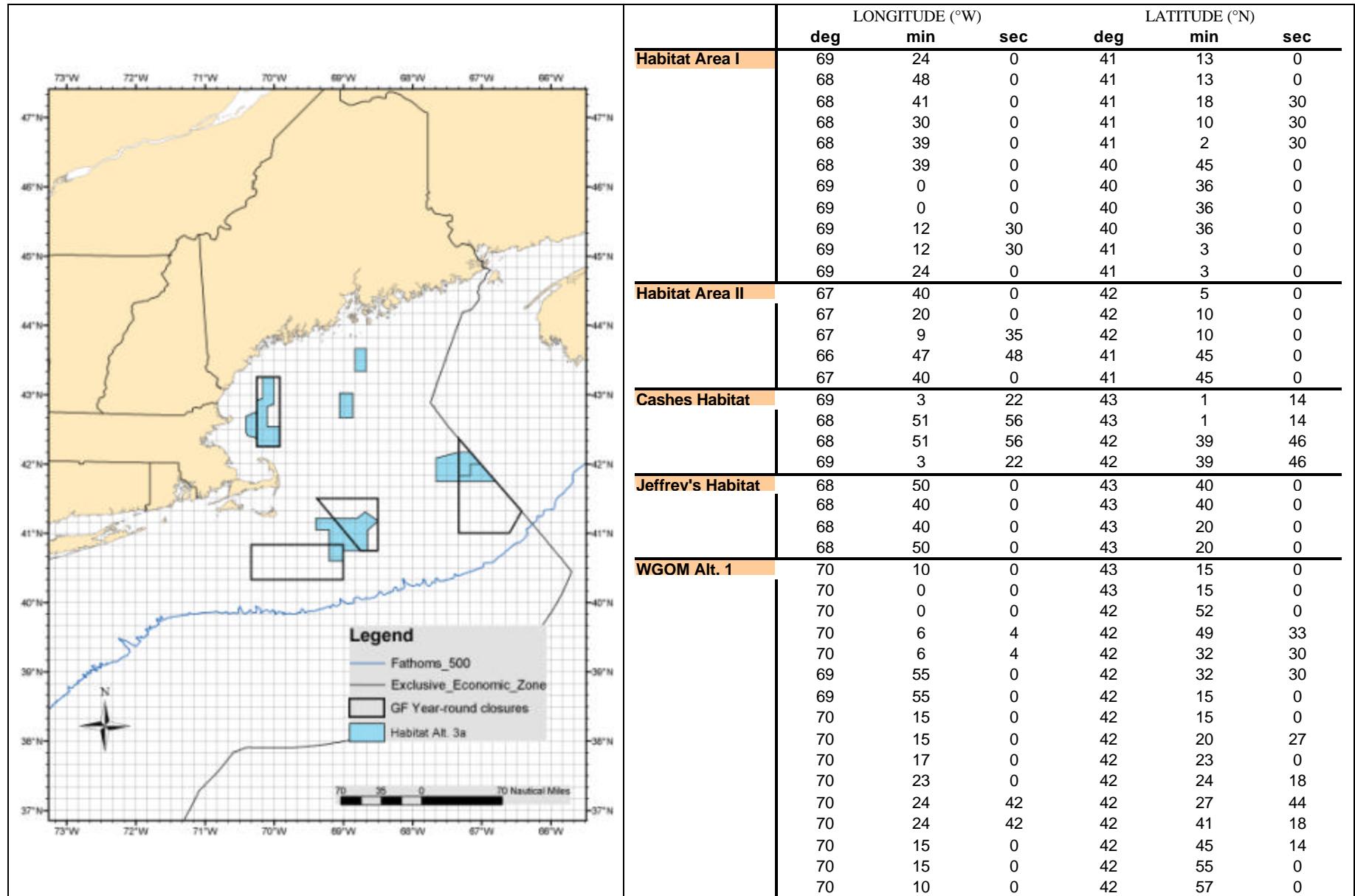
5.3.4.4 Habitat closed areas designed to protect hard-bottom habitats (Alternative #4)

Habitat closure areas in this alternative are derived from areas proposed in alternative 3 that overlap modified groundfish closed areas originally proposed as a stock rebuilding alternative for Amendment 13 of the NEFMC Multispecies Fishery Management Plan. While that alternative has been considered and rejected for stock rebuilding purposes, the Council did not expressly reject the closures proposed in Alternative 4 for habitat management purposes. Because these modifications were rejected for groundfish management purposes, adoption of habitat closed area alternative 4 would not affect the boundaries of the existing groundfish closures. The closures proposed in this alternative are intended to better protect complex hard-bottom and other sensitive habitats from any adverse impacts associated with fishing. They are shown in Map 18.

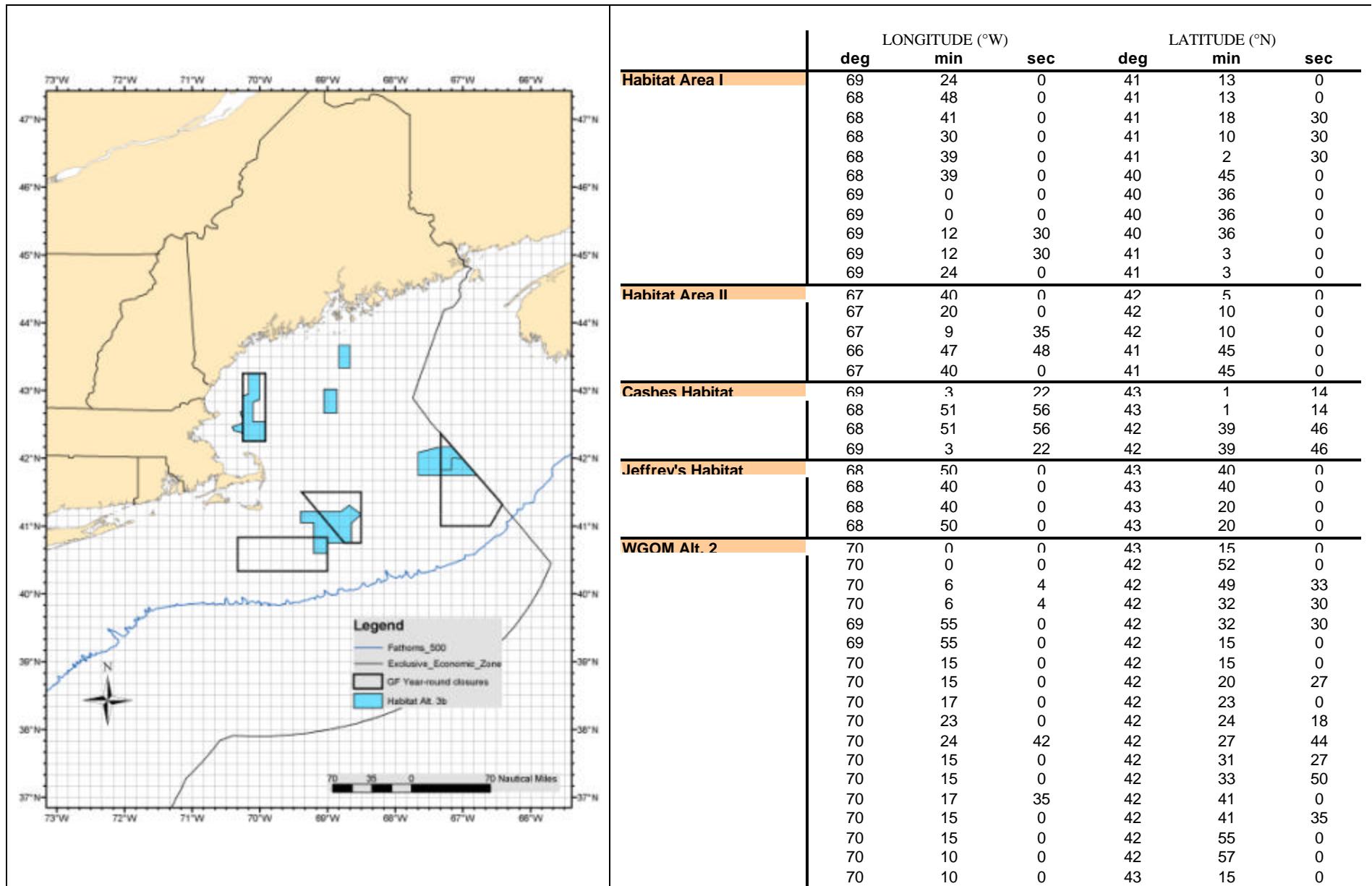


Map 15. Map and coordinates for Habitat Alternative 1.

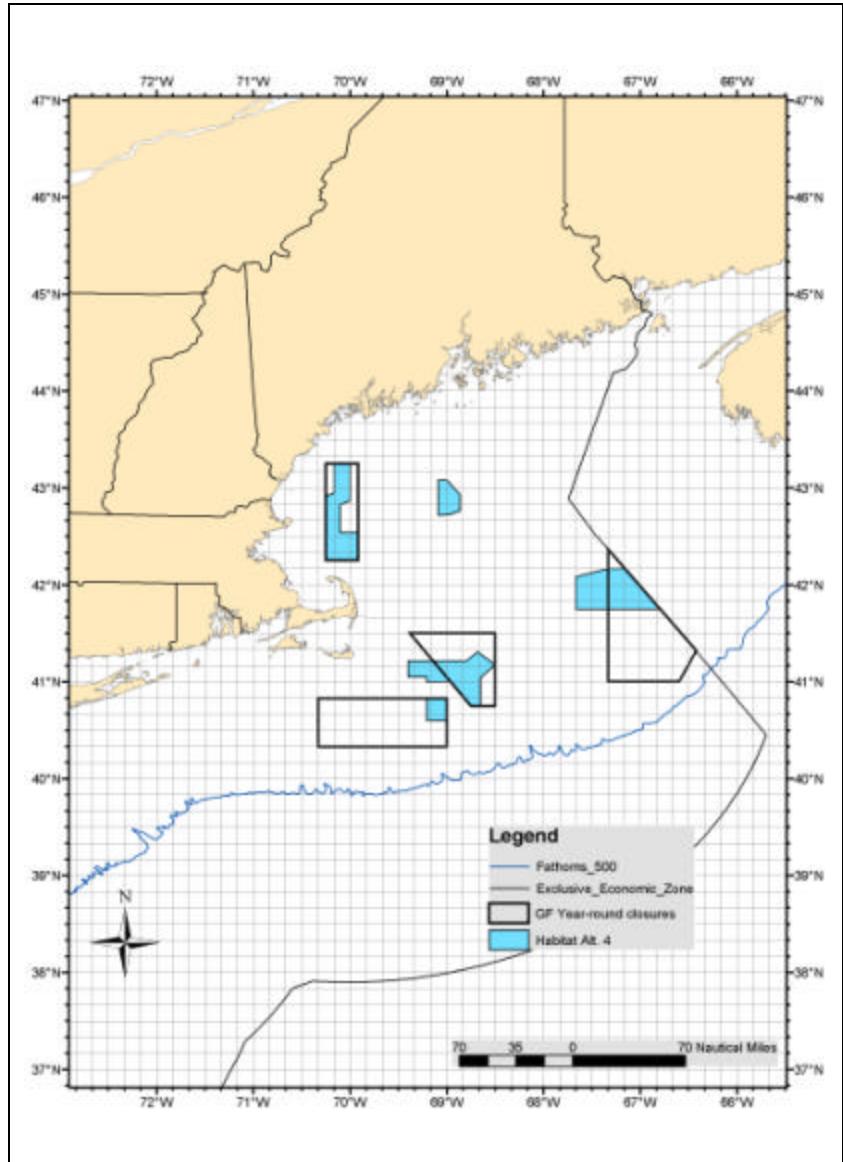
	LONGITUDE (°W)		LATITUDE (°N)	
	deg	min	deg	min
Closed Area I	69	22.8	41	30
	68	30	41	30
	68	30	40	45
	68	45	40	45
Closed Area II	67	19.5	42	21.7
	66	25.5	41	19.2
	66	36	41	0
	67	20	41	0
Nantucket Lightship	70	20	40	50
	69	0	40	50
	69	0	40	20
	70	20	40	20
WGOM	70	15	43	15
	69	55	43	15
	69	55	42	15
	70	15	42	15



Map 16. Map and Coordinates for Habitat Alternative 3a. Current Groundfish closed areas included for reference.



Map 17. Map and Coordinates for Habitat Alternative 3b. Current Groundfish closed areas included for reference.



	LONGITUDE (°W) deg	min	LATITUDE (°N) deg	min
GOM	70	9	43	15
	70	0	43	15
	70	0	42	51
	70	6	42	49
	70	6	42	32
	69	54	42	32
	69	54	42	15
	70	15	42	15
	70	15	42	20
	70	15	42	54
CAI	70	10	42	57
	69	24	41	13
	68	47	41	13
	68	40	41	18
	68	30	41	10
	68	39	41	2
	68	39	40	45
	68	45	40	45
	68	57	41	0
	69	12	41	0
CAII	69	12	41	2
	69	24	41	2
	67	40	42	4
	67	20	42	10
	67	9	42	10
Nantucket	66	47	41	45
	67	40	41	45
	69	0	40	50
	69	0	40	36
	69	12	40	36
Cashes	69	12	40	50
	69	5.8	43	4.4
	68	59.5	43	4.4
	68	51.5	42	55.6
	68	51.5	42	45.6
	68	58.3	42	43.3
	69	5.8	42	43.1

Map 18. Map and Coordinates for Habitat Alternative 4. Current Groundfish closed areas included for reference.

5.3.4.5 Closed areas designed to protect EFH and balance fishery productivity (Alternative #5)

This alternative establishes closed areas that balance the protection of EFH and fishery productivity. Closed areas were determined on the basis of a model that assigned a value for EFH importance and fishery productivity (in the scallop, groundfish, and monkfish fisheries) in each ten minute square from the southern border of Canada to the northern border of South Carolina. Closed areas were then designated based on four decision criteria for each ten minute square: 1) reliance of the stocks on bottom habitat (life history considerations), 2) stock status, 3) relative value to the fisheries and 4) vulnerability of bottom habitat. The model identified one closed area, based on closure areas of more than eight (or nine, depending on the closure shape) contiguous ten minute squares, for each of the management areas (e.g. Gulf of Maine, Georges Bank, Southern New England and Mid-Atlantic). The following four options were developed:

Alternative 5A: EFH/Productivity tradeoffs using the original working group species EFH weights with equal emphasis given to scallop productivity and the combined weighted productivity of 37 other managed species.

Alternative 5B: Total EFH value only, using revised species EFH weights (omitting relative importance to the fishery as a factor), with no productivity tradeoff.

Alternative 5C. EFH/Productivity tradeoffs using the revised species EFH weights with equal emphasis given to scallop productivity and the combined weighted productivity of the other 37 managed species.

Alternative 5D. EFH/Productivity tradeoffs using the revised species EFH weights and productivity for each of the 37 managed species, considered individually. See Section 2.3 in Appendix IV for a detailed description of the model used to determine these closure areas.

Map 19 through Map 22 display maps and coordinates for these closures.

5.3.4.6 Habitat closures consistent with the Framework Adjustment 13 Scallop Closed Areas Access Program (Alternative #6)

In this alternative the year-round groundfish closed areas (WGOM, CA I, CA II and NLCA) that were in place during the 2001 fishing year are considered habitat closures with the exception of those areas opened under the Scallop FW 13 Closed Area Access Program.

See Map 23 for a map of the closures

5.3.4.7 Habitat closures designed to protect areas of high EFH value and low scallop productivity (Alternative #7)

This alternative would close ten minute squares of high EFH value and low scallop productivity, as defined by the same model used to develop habitat Alternative 5 (5a-5d) (See Section 2.3 in Appendix IV). EFH importance was based on the prevalence of EFH designations in each ten minute square. See Map 24.

5.3.4.8 Habitat closure on eastern portion of Georges Bank (inside and outside of Cod HAPC)(Alternative #8)

5.3.4.8.1 8a: Habitat closure encompassing the Cod HAPC on Georges Bank

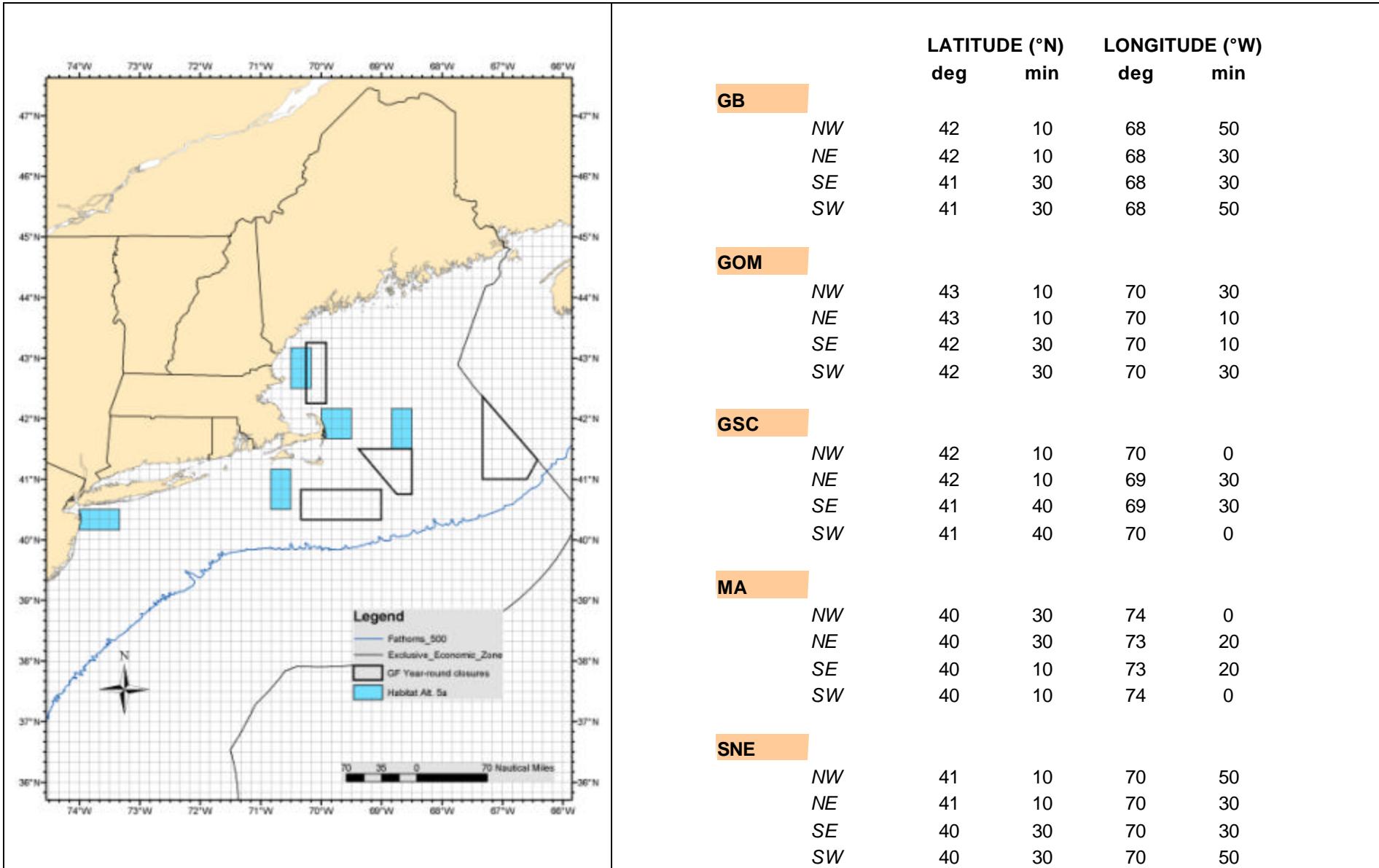
This alternative would change the status of the cod HAPC from a mortality closure to a habitat closure. Significant portions of these areas contain gravel pavement and cobble bottom, believed to be the most sensitive to the effects of scallop dredging.

8b: Habitat closure encompassing the Cod HAPC and an expansion to the west

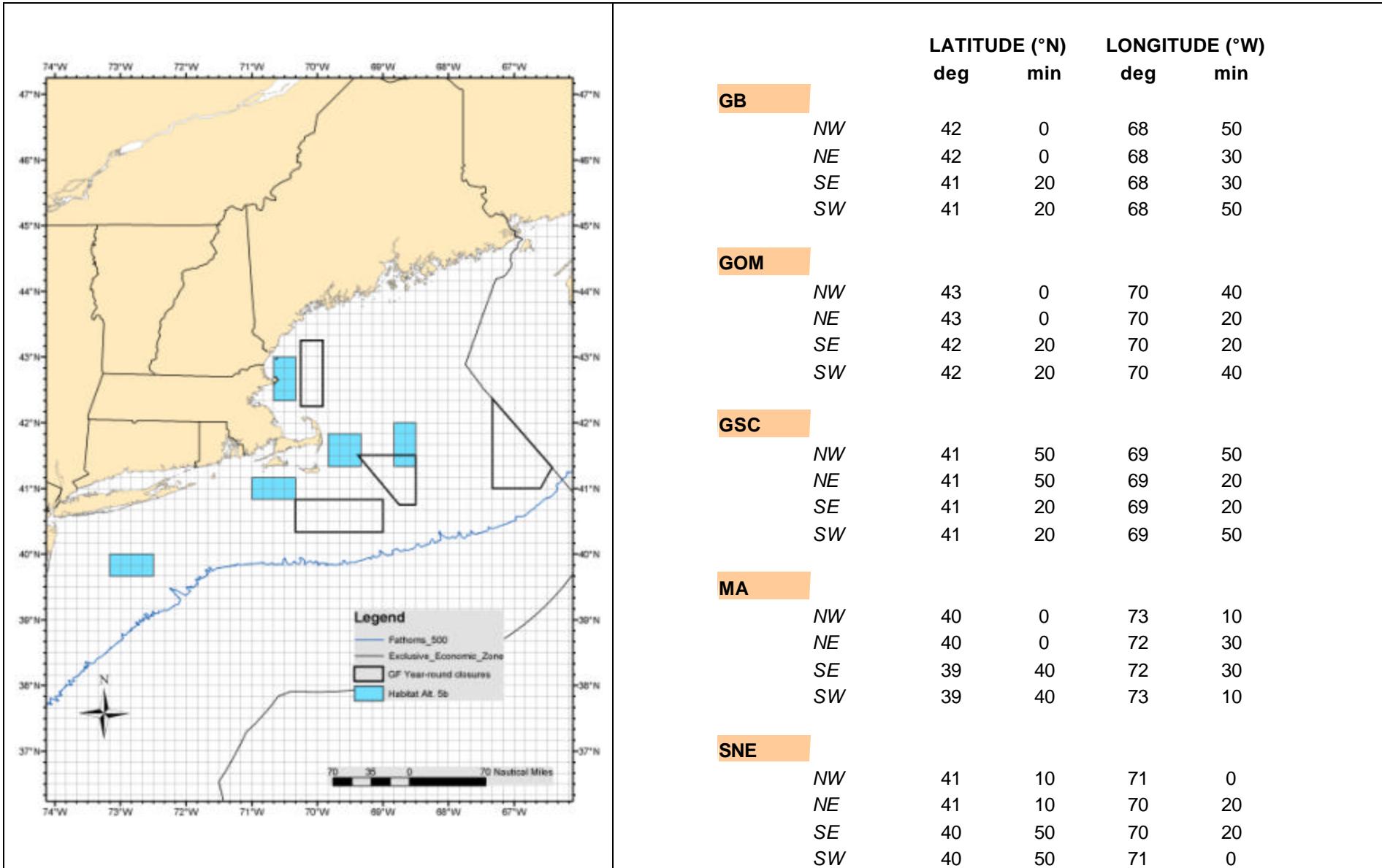
This alternative would create a Habitat Closed area that includes the existing Cod HAPC on Georges Bank and includes additional area to the west. This alternative would NOT expand the actual HAPC designation, it would change the status of the Cod HAPC from a mortality closure to a habitat closure. The area that would be closed in this alternative is the same area as Habitat Area II in Habitat Alternative 3a and 3b. (See Map 26).

5.3.4.9 Existing groundfish mortality closed areas (Alternative #9)

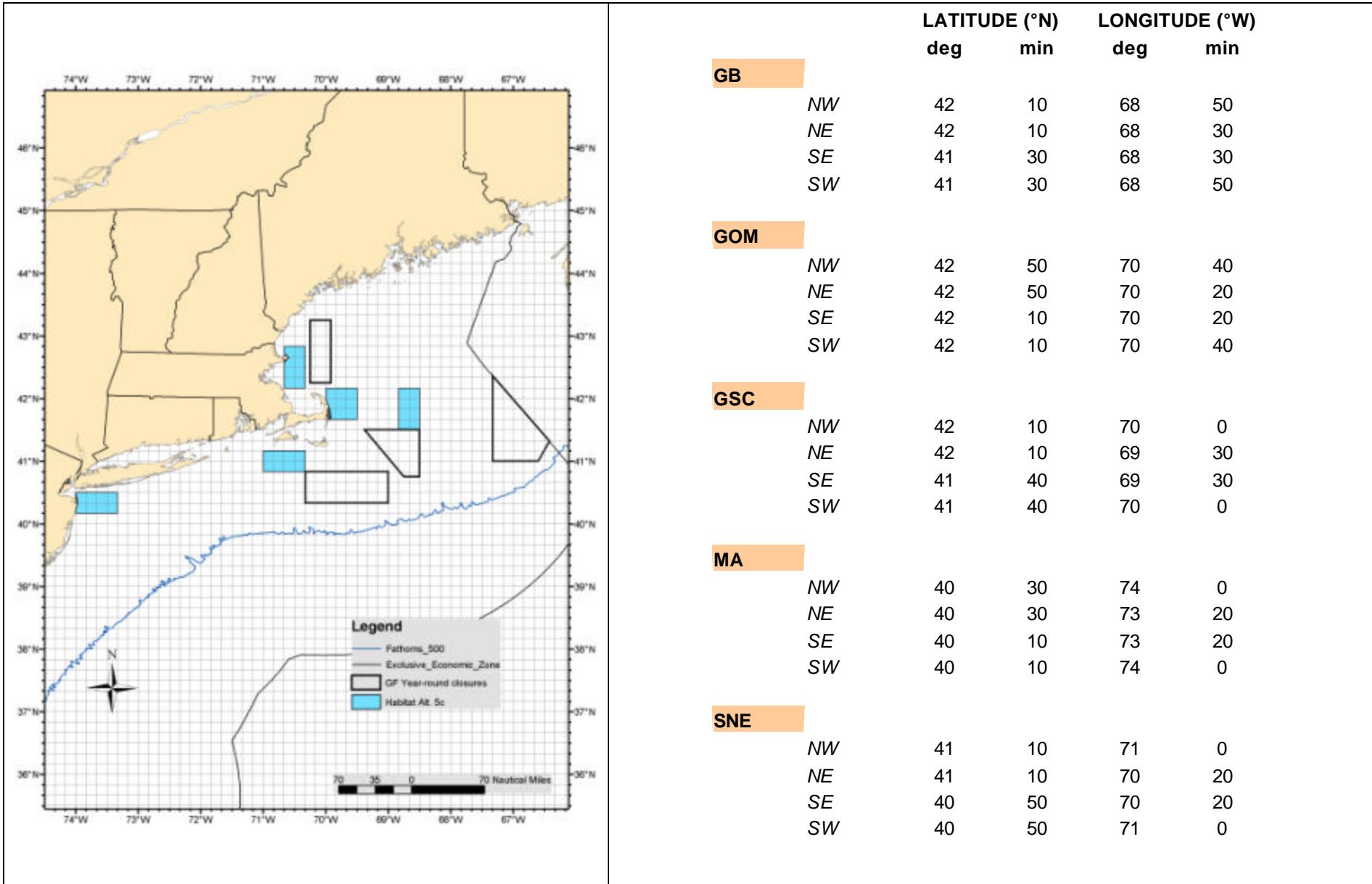
The existing year-round groundfish closed areas (per the CLF vs. Daley settlement agreement) on Georges Bank and in the Gulf of Maine would continue to be closed to scallop fishing (gear adversely impacting scallop EFH or gear capable of catching scallops). These include Closed Area I, Closed Area II, Western Gulf of Maine Closure, Nantucket Lightship Closed Area and the new Year-Round Cashes Ledge Closure (See Map 27). This alternative would change the status of these closed areas from mortality closures to habitat closures.



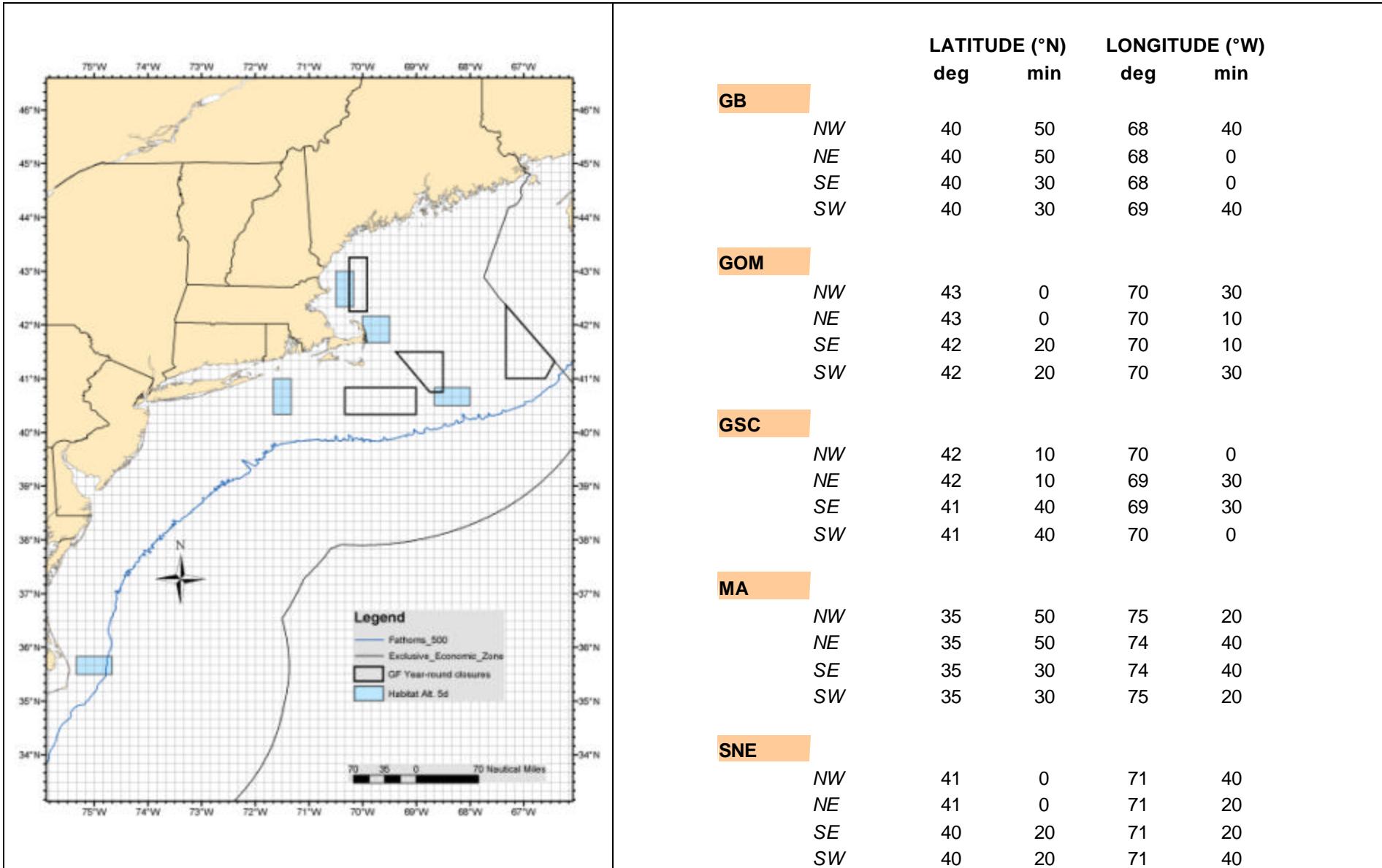
Map 19. Map and Coordinates for Habitat Alternative 5a. Current Groundfish closed areas included for reference.



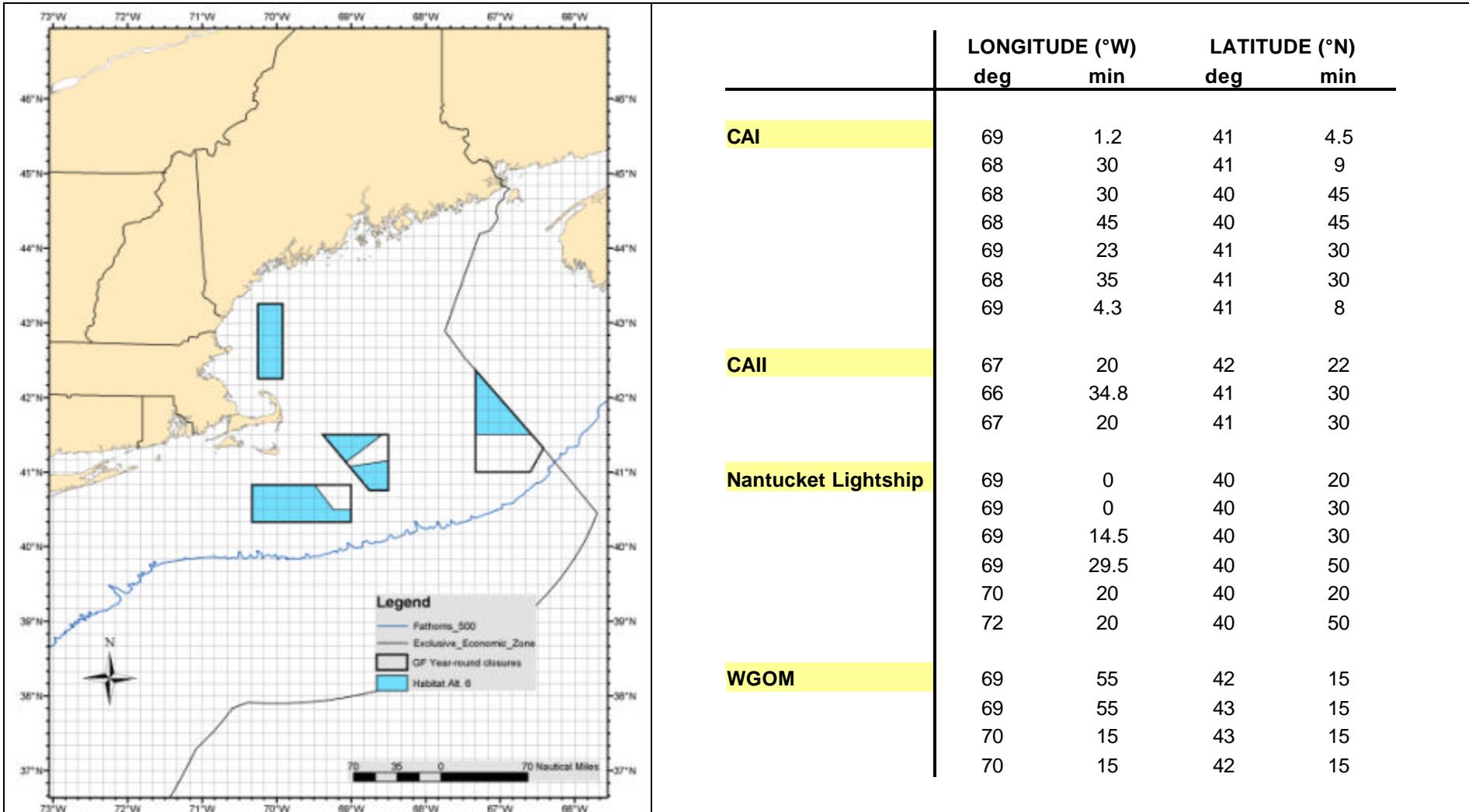
Map 20. Map and Coordinates for Habitat Alternative 5b. Current Groundfish closed areas included for reference.



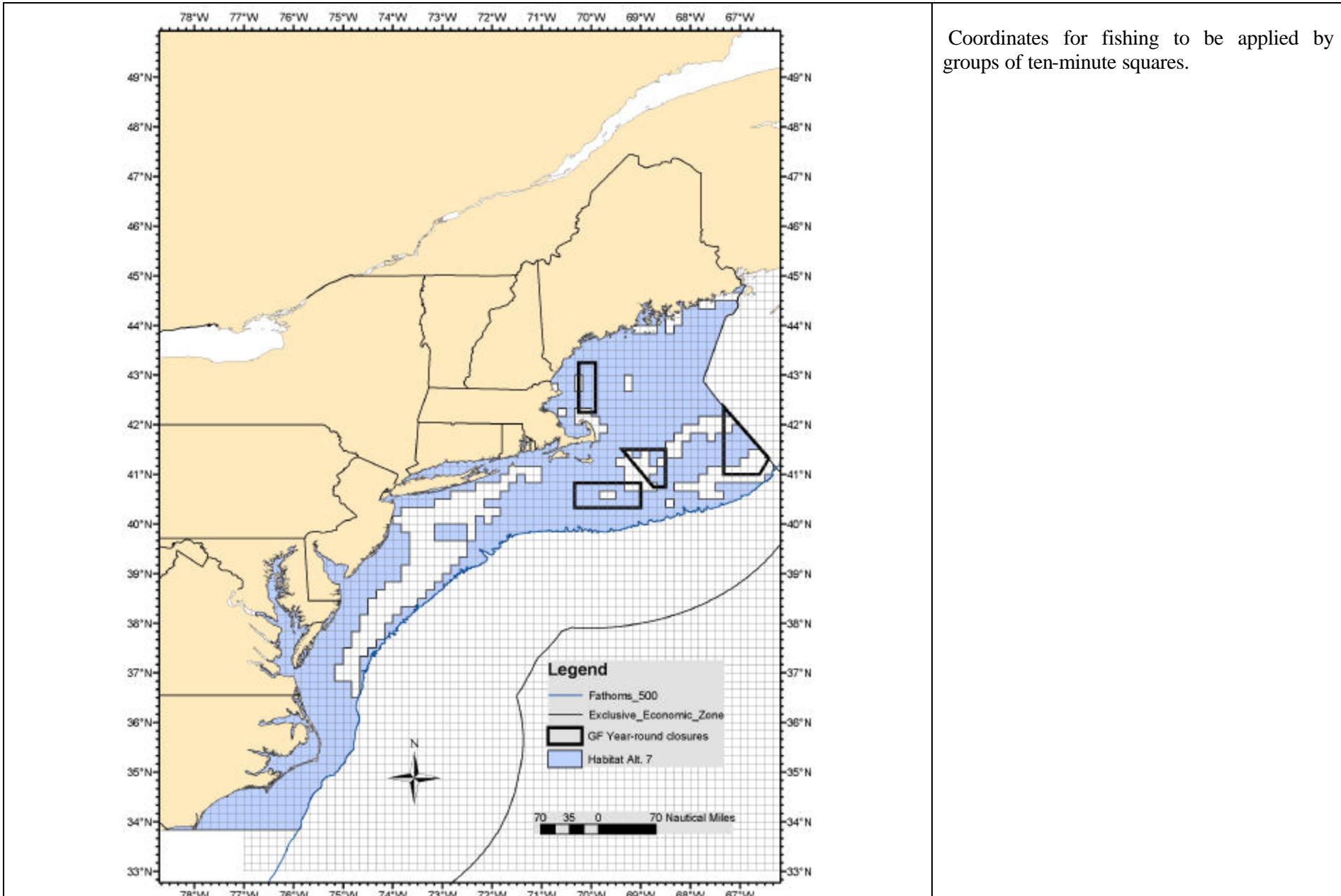
Map 21. Map and Coordinates for Habitat Alternative 5c. Current Groundfish closed areas included for reference.



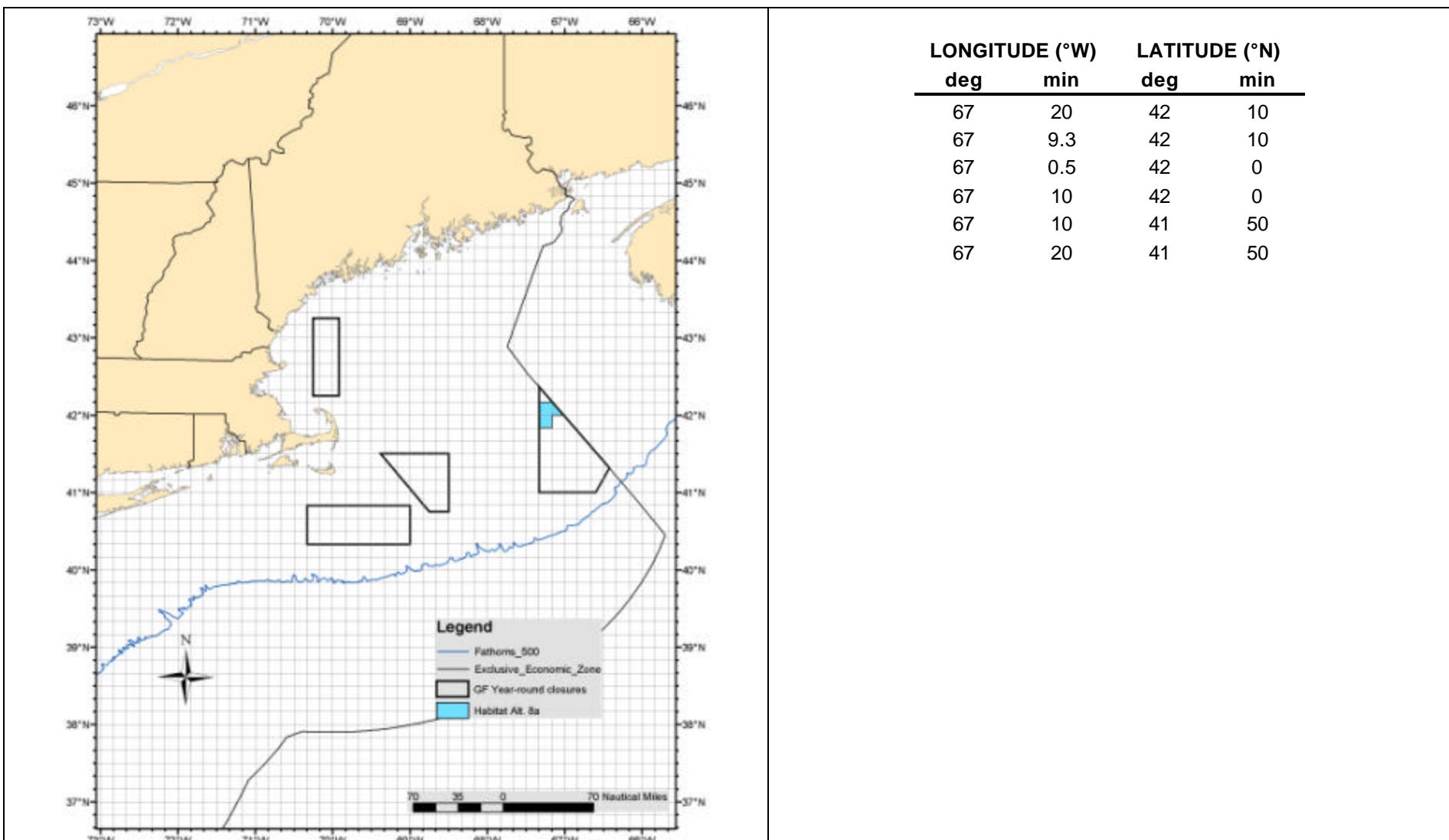
Map 22. Map and Coordinates for Habitat Alternative 5d. Current Groundfish closed areas included for reference.



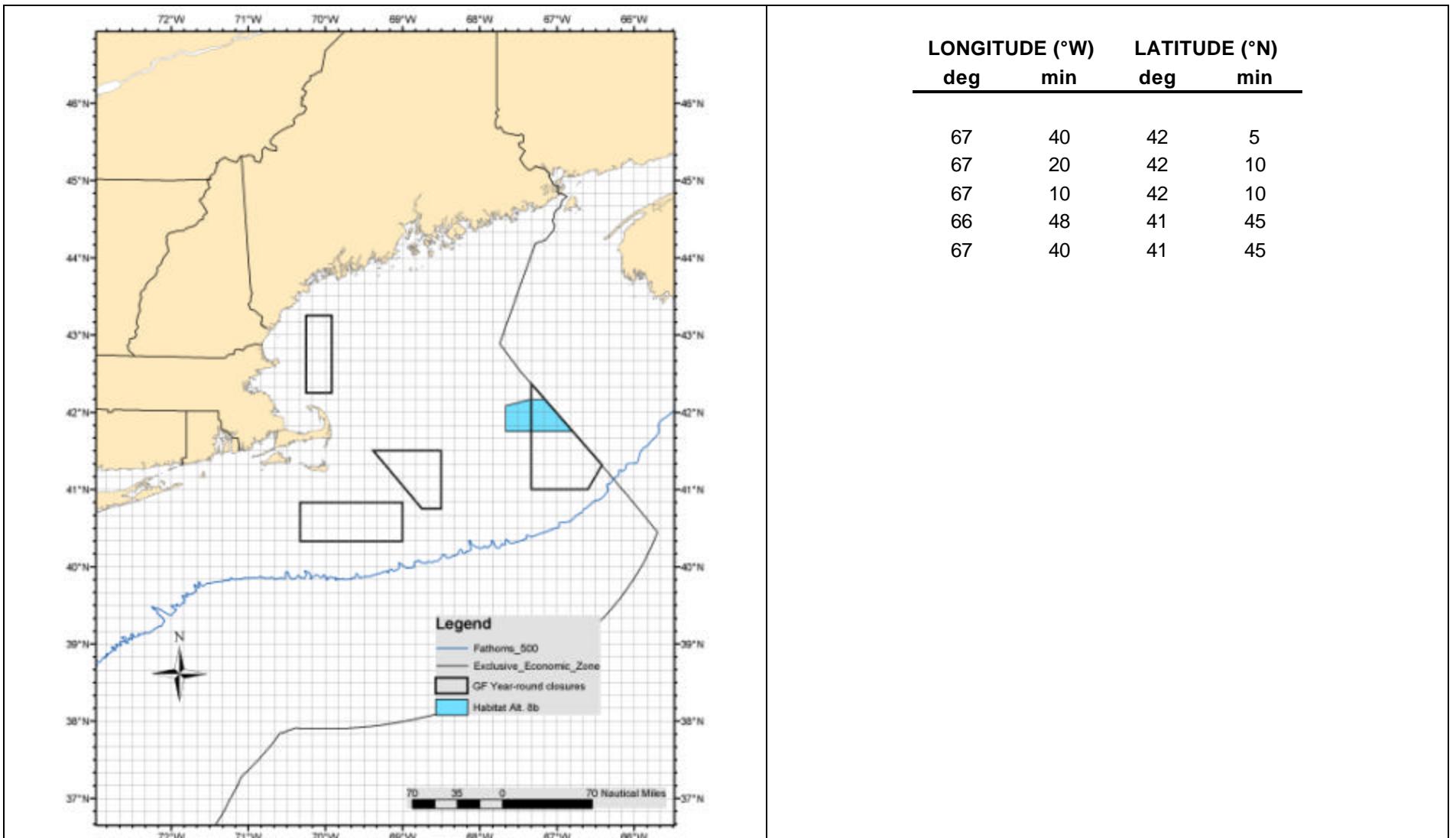
Map 23. Map and Coordinates for Habitat Alternative 6. Current Groundfish closed areas included for reference.



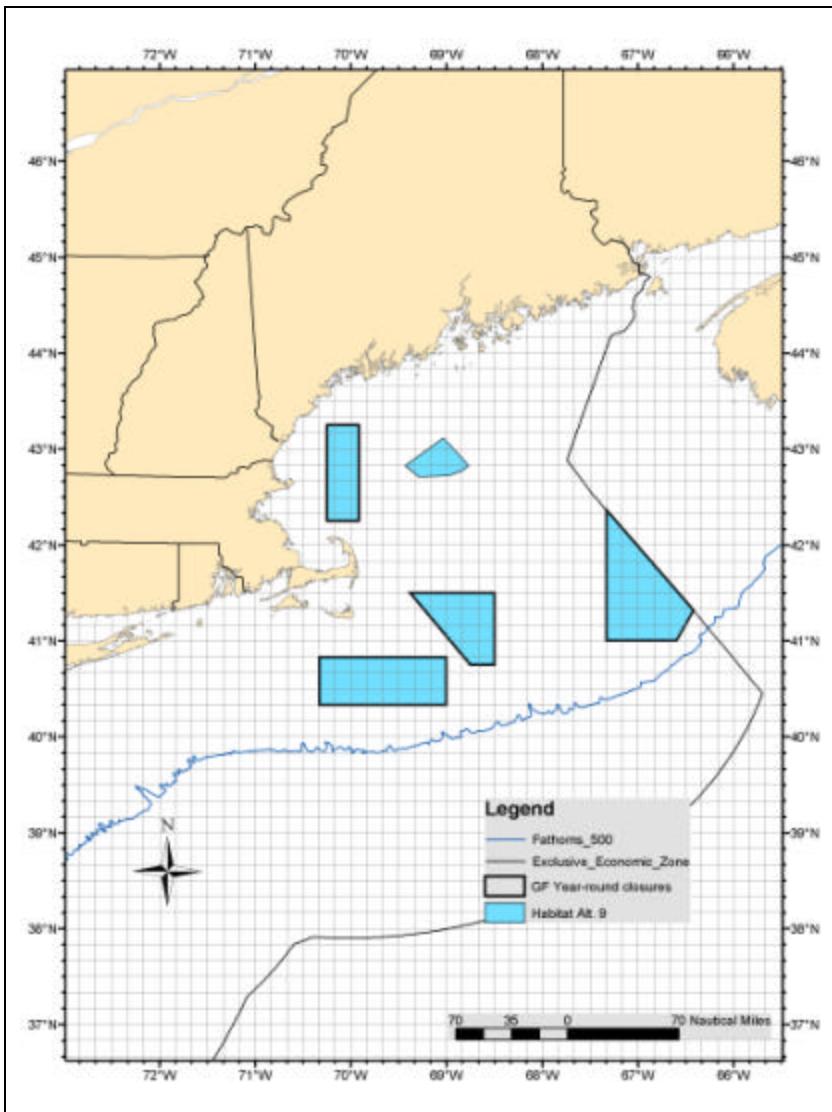
Map 24. Map and Coordinates for Habitat Alternative 7. Current Groundfish closed areas included for reference.



Map 25. Map and Coordinates for Habitat Alternative 8a. Current Groundfish closed areas included for reference.



Map 26. Map and Coordinates for Habitat Alternative 8b. Current Groundfish closed areas included for reference.



Map 27. Map and Coordinates for Habitat Alternative 9. Current Groundfish closed areas included for reference.

	LONGITUDE (°W)		LATITUDE (°N)	
	deg	min	deg	min
Closed Area I	69	22.8	41	30
	68	30	41	30
	68	30	40	45
	68	45	40	45
Closed Area II	67	19.5	42	21.7
	66	25.5	41	19.2
	66	36	41	0
	67	20	41	0
Nantucket Lightship	70	20	40	50
	69	0	40	50
	69	0	40	20
	70	20	40	20
WGOM	70	15	43	15
	69	55	43	15
	69	55	42	15
	70	15	42	15
Cashes	69	26	42	49.5
	69	2	43	7
	68	46	42	49.5
	68	50.5	42	46.5
	68	58.5	42	43.5
	69	17.5	42	42.5

5.3.4.10 Restrictions on rock chains (Alternative #10)

Vessels with limited access and general category scallop permits would have limits on the amount, and possibly configuration, of rock chains.

Rationale : Scallop vessels using dredges often use rock chains in some areas to deflect large rocks, boulders, and other debris. It prevents damage to fishing gear, handling problems at the surface and on deck, improves safety at sea, and reduces bycatch mortality due to crushing. On the other hand, the use of rock chains allows vessels to fish in more rugged areas, having complex habitats. Controlling the use of rock chains has the potential to reduce fishing in these areas having more sensitive and vulnerable habitats.

5.3.4.11 Increasing dredge ring size to 4-inches in all or select areas (Alternative #11; described fully in Section 5.3.2.9)

Option 1: Scallop dredge ring size would be required to be at 4-inches everywhere

Option 2: Scallop dredge ring size would be required to be 4 inches in a “re-opened” status, including groundfish closed areas if an access program is active.

Rationale : These alternatives are proposed primarily to reduce mortality on small scallops where scallops are of mixed sizes. Research has determined that the efficiency for catching larger scallops (e.g., greater than 110 mm shell height) also improves. Thus the improved dredge efficiency has the potential for reducing bottom time, non-catch mortality, bycatch, and possibly habitat effects. Option 2 is proposed because requiring the use of 4-inch rings throughout the resource could actually increase fishing time in areas where fewer large scallops are available.

5.3.4.12 Habitat research funded through scallop TAC set-aside (Alternative #12)

Scientists conducting habitat research that is related to the effects of scallop fishing could apply for funding through the research TAC/day-at-sea set aside (Section 5.3.8.1.4). Research is needed to quantify or evaluate the long-term effects of scallop fishing on the essential fish habitat and to estimate habitat recovery rates. Some of the funds from a TAC set-aside would promote such research.

Rationale : This alternative would broaden the range of research types that could be funded through the scallop research TAC set aside, proposed in Section 5.3.8.1.4. Research funded through this mechanism could identify fishing gear or methods that have fewer habitat impacts, or might be useful to identify ways that fishing is managed to minimize related habitat impacts.

5.3.4.13 Area based management and rotation based on habitat protection (Alternative #13)

This alternative would integrate habitat management with area rotation. The concept is outlined and described in Section 5.3.2.7, one of the scallop area rotation alternatives. Under the alternatives, the frequency, duration, and intensity of scallop fishing in rotation management areas would be modified to minimize adverse habitat impacts. Although the concept and structure of this alternative is described in

Section 5.3.2.7, specific criteria for controlling the frequency, duration, and intensity of scallop fishing have not been defined.

Rationale : Habitat impacts could vary with the frequency, duration, and intensity of scallop fishing. For example, rotation management area closures could reduce overall habitat impacts by allowing time for a more complete habitat recovery after a period of fishing. Some benthic species take longer to recolonize the bottom and restore ecological structure than it takes for scallops to grow from juveniles to an optimum size for harvest as adults. On the other hand, scallop yield loss from waiting too long to fish is small for a slightly longer closure (an additional 3-5 years, for example), but could have measureable benefits to the ecosystem. Over a longer period, the annual scallop yield loss (because scallops don't migrate) would approach the natural mortality rate, or about 20 percent per year. Very long rotation management area closures would also increase the risk of episodic, widespread scallop mortality from thermal stress or predation. Thus, habitat impacts from scallop fishing might be addressed through adjustments in area rotation strategies rather than long-term, indefinite closures described in other habitat alternatives in this section.

5.3.5 Alternatives for Reducing Bycatch and Bycatch Mortality

Area rotation and larger rings both significantly contribute to reducing bycatch by increasing dredge efficiency. By focusing fishing effort where catch rates are high and by improving the efficiency of catching large scallops, the total area swept by commercial dredges at the target fishing mortality decreases. In addition, a dredge using larger rings appears to catch fewer small fish for some species, and also catches fewer invertebrates (Section 8.2.8).

In addition to these alternatives described elsewhere in the document, the Council is proposing several additional measures that would reduce finfish bycatch and an alternative that would reduce the probability of interactions with sea turtles. The scallop fishery operates in areas that overlaps with concentrations of many other species of fish, marine mammals, turtles and other marine life. Because of the nature of the fishery, i.e., a mobile gear fishery, many species that are encountered have the potential for capture and mortality. Certain flounder species, such as yellowtail flounder, are frequently captured in scallop dredge and trawl gear, for example. Table 186 to Table 188 include a list of finfish species commonly caught in scallop fishery as bycatch. In addition, the scallop dredge fishery has seen an increase in sea turtle captures. In order to better comply with National Standard 9, which mandates that bycatch and bycatch mortality be minimized to the extent practicable, this section presents alternatives that are intended to reduce bycatch and bycatch mortality in the scallop dredge fishery. Alternatives are also included in order to address the takes of sea turtles which is prohibited or restricted under the Endangered Species Act.

5.3.5.1 Area rotation

These alternatives are described in Sections 5.1.3.1 to 5.3.2.8.

Rationale : Area rotation management will reduce fishing in areas with lower biomass of large scallops. Fewer vessels would target areas with abundant small scallops to pick larger scallops from the catch for shucking while towing large areas to compensate. This effect, combined with crew restrictions that cap shucking capacity, reduce the amount of fishing per day-at-sea when catch rates are higher than the crew's shucking capacity. Since finfish bycatch is proportional to the amount of area towed (unless effort is re-distributed to areas with higher finfish catch rates), bycatch declines as the amount of area swept decreases.

5.3.5.2 Increasing the minimum ring size to 4-inches in all or select areas

This alternative is described in Section 5.3.2.9

Rationale : Dredges with 4-inch rings increases efficiency for capturing large (> 110 mm) scallops by about 10-15 percent, thereby reducing the area swept by commercial dredges by 10-15 percent. Since finfish bycatch is proportional to the amount of area towed (unless effort is re-distributed to areas with higher finfish catch rates), bycatch declines as the amount of area swept decreases.

If few large scallops are available to the gear, however, it would take longer to capture the larger scallops retained by dredges with 4-inch rings. Tow duration would increase, and if the catches are near the crew's shucking capacity, the tow durations would increase to compensate for the reduced scallop catches. If the catch rates for a 3½-inch ring dredge were less than the crew's shucking capacity, the tow duration might increase only a little because the vessel hauled the dredge less frequently during continuous fishing operations. Vessels might also attempt to increase tow speed to compensate for the lower catch, if the 4-inch rings are used where abundance of large scallops is below average.

5.3.5.3 Increase minimum twine top mesh to 10-inches in all or select areas, and/or specify how twine tops should be installed in dredges

Scallop dredges would be required to be constructed with twine tops having mesh no less than 10-inches, increasing from 8-inches presently required in open scallop fishing areas. One option would make this a requirement everywhere and another option would make it a requirement for areas in a 're-opened' status. Factors that could be regulated include setting the number of meshes to be attached to the dredge, the minimum size of the twine top, and specifying the use of square or diamond mesh, whichever is more effective to allow finfish escapement.

Implementation would be delayed for six months for any rule that changed the type of twine tops that fishermen are required to use while fishing in open rotation areas. Implementation would coincide with the final rule for Amendment 10 for twine tops or configurations required in re-opened areas, including the groundfish closed areas.

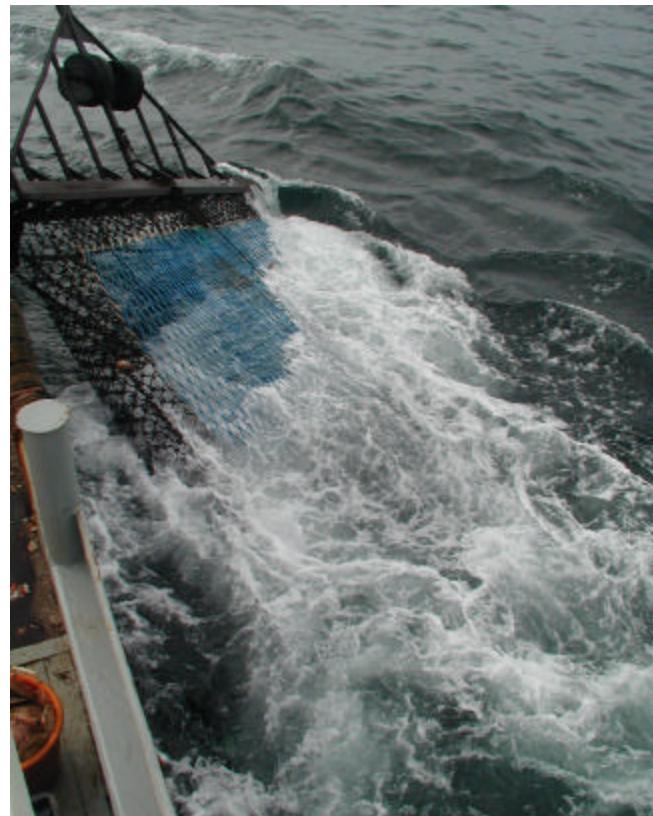


Figure 6. Picture of twine top with dredge at the surface.

Rationale : Larger twine tops reduce finfish bycatch for many species (Section 8.3.3), particularly in areas with large scallops that infrequently escape through the twine top. Specifications for how the twine tops is installed within the dredge or the number of meshes in a twine top could prevent fishermen from mitigating the effectiveness of the twine top.

Delayed implementation would allow suppliers to manufacture or obtain the 10-inch mesh twine tops. It would also allow suppliers to draw down existing gear inventory and allow fishermen time to use gear purchased before

Amendment 10 is implemented. Full-time vessels replace twine tops several times a year, but vessels keep a supply on hand to repair damaged dredges.

Twine top mesh larger than 10-inches was not considered in Amendment 10, because previous studies using 12-inch twine top mesh indicated excessive scallop loss, which would have the strong potential to reduce dredge efficiency and increase the effects of scallop fishing from compensatory towing and higher day-at-sea allocations to achieve optimum yield.

Probable short-term consequences

Twine tops with 10-inch mesh would immediately reduce finfish bycatch, particularly where large scallops are abundant. This would have little effect on the landings of non-target species because restrictive possession limits for many finfish already apply. Without measures to keep bycatch low, it is unlikely that scallop vessels would be authorized to fish in the Georges Bank groundfish closed areas, considerably reducing scallop yield and day-at-sea allocations.



Figure 7. Crewman sewing a twine top into a scallop dredge. This procedure takes about 30 – 45 minutes at the dock or in good weather.

5.3.5.4 Gear modifications based on recent research

Current research on finfish excluder devices (a modification of the dredge bail) show promising results for some species, but more testing is needed in a variety of areas and conditions. If the ongoing research show significant decreases of finfish catch and insignificant decreases in scallop catches, fishermen would be required to make modifications to the dredge bail to comply. The modifications to the research dredge have so far required only some changes to existing bails, which can be accomplished in a few hours by a welder. Alternatively, the Council may require gear modifications by framework adjustment, using a deliberative process outlined in Section 5.3.5.6.



Figure 8. Bail of a scallop dredge. The frame acts to keep the dredge bag spread wide and on the bottom. Note the shiny part of the bail that keeps contact with the bottom, versus other portions of the bail that do not.

Rationale : Research to date has been conducted via paired-comparisons on a single trip to a groundfish closed areas. The results for some species show very significant reductions in finfish catches, but catches of other species are unaffected by the modifications. If additional research in other areas shows consistently better results over the control dredge, the gear modification would be required through the final proposed actions in Amendment 10 or a future framework action.

5.3.5.5 Area-specific possession limits for some finfish species

The Council would specify possession limits for non-target finfish catches in re-opened rotation management areas through framework or other adjustments. A procedure outlined in Section 5.3.5.6 would be followed to identify which species would be managed with a possession limit and the amount of fish that may be retained.

Rationale : Prohibiting scallop vessels from landing finfish could reduce the incentive to fish in portions of rotational management areas that have higher bycatch than in other areas. Species that might be regulated with an area-specific possession limit include species that are vulnerable to capture by scallop gear and are overfished, e.g. Southern New England yellowtail flounder, monkfish, and possibly winter flounder).



Figure 9. Club stick and chafing gear attached to the rear of a scallop dredge.

5.3.5.6 Area-specific TACs for some finfish species

The Council would specify total allowable catches for some species of finfish bycatch through framework or other management actions (including automatic sunsets and annual specifications) that re-open areas to fishing after a period of closure. Catches of non-target species would be monitored by sufficient observer coverage to estimate bycatch at the scale of the area-based management program (see

Section 5.3.7.1). When the total catch (retained and discarded) meets the TAC for any such bycatch species, a rotation management area would close to scallop fishing for the remainder of the scallop fishing year.

The process for closing management areas for scallop grow out will occur on a periodic basis. At the time of closing an area, a duration and geographic area will be set for the closure. Therefore, when an area is closed, it is also scheduled to re-open on a date specific or predicted to re-open if adaptive re-openings are chosen. When the Council expects an area to re-open, at least 18 months prior, the committee will send out a notice to the appropriate committees to solicit input from a broader group should the need arise. Relevant questions to be evaluated include:

Is there an identified need to be addressed under this scallop plan in the re-opening?

If yes, to what magnitude?

If there is a need to constrain mortality for a species caught in the scallop fishery, a consulted committee may recommend a total allowable catch (TAC) and inform the Scallop Oversight Committee of other relevant issues.”

The Scallop Oversight Committee would respond with a framework adjustment or other management action, including an automatic sunset provision, that re-opens or set limits on re-opened rotation management areas. Possible actions include:

Set a season (Section 5.3.5.7)

Require a gear modification (Section 5.3.5.4)

Set a trip limit (Section 5.3.5.5)

Set a hard TAC for area opening (this alternative).

Rationale : The purpose of setting TACs for re-opened areas is to prevent incidental catches from exceeding biological limits from the higher than average scallop fishing effort in re-opened areas. The TAC for non-target species also is intended to induce fishermen to fish in portions of the area with lower bycatch and/or use gear or methods that reduce bycatch. If the catch of non-target species is above the biological limits, the scallop fishermen will have less access to the resource in a re-opened area that has critical species that are vulnerable to capture by scallop fishing. If the scallop fishermen can avoid catching these non-target species, the re-opened area could stay open as long as the scallop management plan allows.

Probable effects in 2003 and 2004

Several groundfish species are in an overfished condition and have a poor prognosis for rebuilding. It is likely that the Council would set TACs for re-opening the groundfish closed areas to scalloping, if the Council allows scallop fishing there. These species may include, but are not limited to yellowtail flounder, cod, winter flounder, barndoor skate, and monkfish.

5.3.5.7 Area-specific seasons to avoid bycatch

Based on analysis in Section 8.3.1, six of the 24 rotation management areas and 9 one-degree blocks are proposed for seasonal closures for all scallop gear to minimize bycatch. **The one -degree blocks only include areas that are outside of the rotation management areas that may overlap them** Unless otherwise prohibited, transiting these areas would be allowed, provided that gear is properly

stowed. These areas would protect species that are most vulnerable to scallop fishing and based on the analysis in this document to identify areas and seasons with extraordinary bycatch include:

1. Rotation management areas along the northern edge of Georges Bank (GB7 to GB9, and GB15) would be closed to scallop fishing in July to December.
2. In the Gulf of Maine, an area bounded by 42° to 43° N latitude and 67° to 71° longitude (4 one-degree blocks) would close to scallop fishing from July to October.
3. Two one-degree blocks around Cape Cod, bounded by 41° to 42° N latitude and 70° to 72° W latitude from July to December, excluding rotation management areas that may overlap these boundaries.
4. In the Mid-Atlantic rotation management area MA8 and an area bounded by 40° to 41° N latitude and 70° to 71° W longitude would close during October to December, excluding rotation management areas that may overlap these boundaries.
5. Rotation management area MA9 would close to scallop fishing from October to June.
6. Two one-degree blocks inshore of the rotation management areas offshore of NJ, bounded by 38° to 40° N latitude and 74° to 75° W longitude would close during July to September.

Rationale : These areas and seasons have the most frequent occurrences of high incidental catches and discards, for species that are frequently caught by scallop dredges. Seasonal closures would allow scalloping during a portion of the year when finfish bycatch is not exceptionally high. Should the Council select this alternative, it may be necessary to modify the seasons to ensure practicability of the action when taken in combination with other actions in Amendment 10.

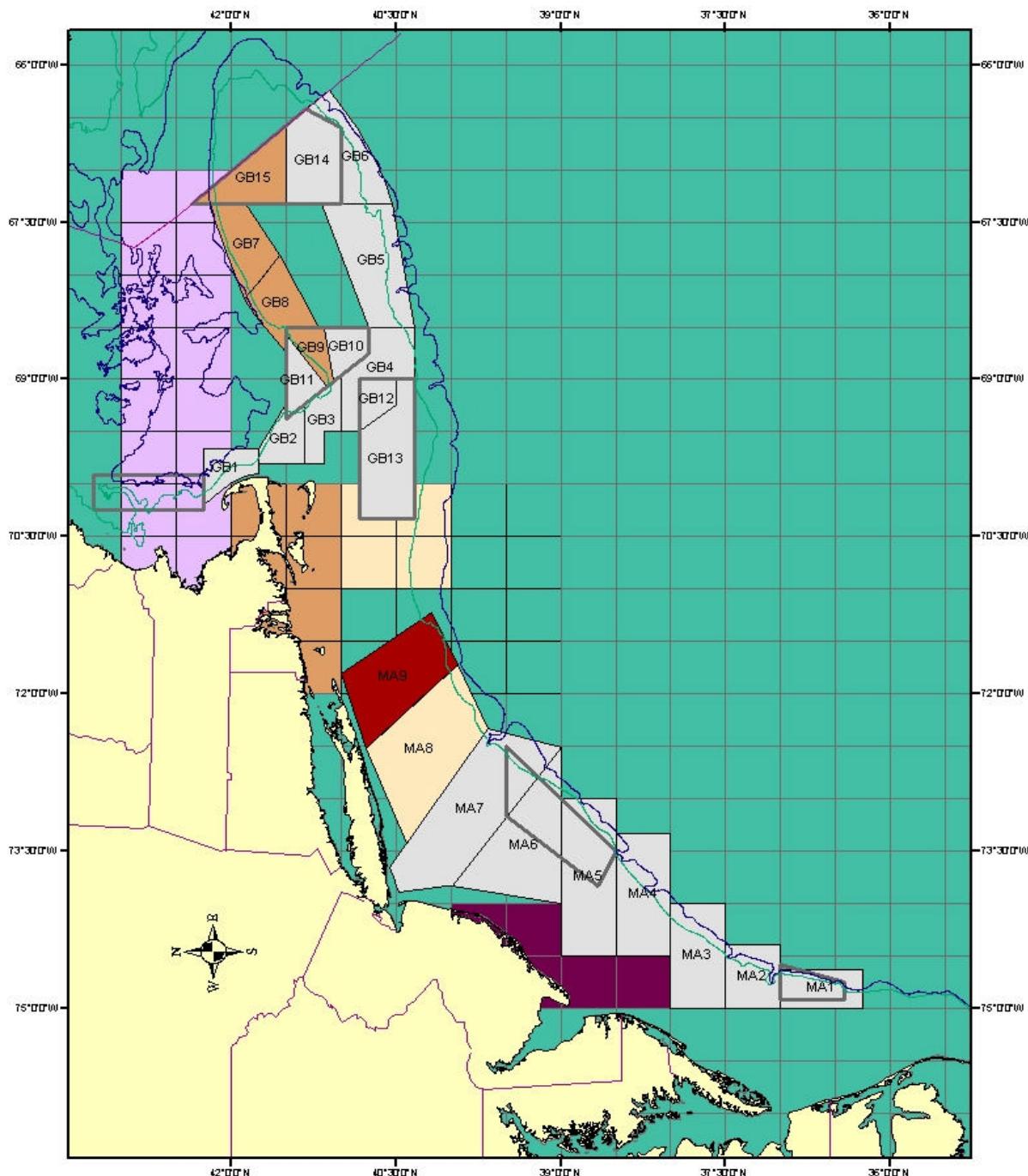


Figure 10. Proposed seasonal closures to minimize finfish bycatch and bycatch mortality. Violet areas (Gulf of Maine) would be closed during July to October. Orange areas (Georges Bank) would close during July to December. MA9 (maroon) would close from October to June. Beige areas (MA8 and west of Nantucket Lightship Area) would close during October to December. Plum areas (Mid-Atlantic) would close during July to September.

5.3.5.8 Long-term, indefinite closures to avoid areas with high bycatch levels

Areas with high bycatch may be closed to scallop fishing indefinitely when other methods to minimize bycatch and bycatch mortality are unsuccessful. Rotation management areas and other scallop fishing areas may be closed in whole or in part until the regulation is no longer needed (i.e. conditions change to reduce the interaction or other measures become effective). Areas such as those under consideration for the NE Multispecies FMP may be incorporated in the scallop FMP under this alternative, or other areas may substitute.

Rationale : National Standard 9 requires the Council to minimize bycatch and bycatch mortality, to the extent practicable. This is a failsafe mechanism to ensure that National Standard 9 is achieved, especially if other methods cannot minimize bycatch and bycatch mortality to acceptable levels. Closures should be used when other methods to minimize bycatch and bycatch mortality are unavailable or when bycatch is frequently very high.

Probable effects in 2003 and 2004

Portions of the groundfish closed areas that remained closed to scallop fishing during 2000 (Framework Adjustment 13) appear to have the most frequent occurrences of high catches of non-target finfish. These areas include rotation management areas GB10, GB11, GB13, and GB15. Keeping these area closed indefinitely is one of the options considered in Section 5.3.2.8.

5.3.5.9 Develop a proactive protected species program

The Council passed a motion at its November 2001 meeting that established steps to be taken to address protected species issues in the scallop fishery. This alternative is proposed to address the majority of the recommendations set out at that meeting. It provides a mechanism to close areas through a framework adjustment to reduce the risk of encounters between turtles (as well as other protected species) and fishing gear used in the scallop fishery, and the necessary data collection and analyses needed to address the Council's recommendations. It also provides suggestions for gear research to determine how sea turtles are caught and how to reduce the potential for those captures.

Management Measures – The alternative described in Section 5.3.5.7 would allow area re-openings to be timed in a manner to minimize the interactions between scallop gear and protected species found in the action area, particularly sea turtles. This measure could be applied to the Mid-Atlantic region during the sea turtle concentration period from June to November and be modified as resource conditions or fishery operations change.

This section provides for closures of areas or modifications to gear or fishing operations to protect sea turtles and any other protected species through a framework adjustment to the FMP. Further discussion in future framework documents would address the specific problem and fully describe the timing, duration and other requirements associated with the action, as well as provide the appropriate analyses and background information.

Data Collection and Analyses – Current data collection levels may not be adequate in the mid-Atlantic region where sea turtles are found and where interactions have been documented. At a minimum the Council recommends increased coverage of the scallop dredge and trawl vessels fishing in the mid-Atlantic area from May through December to more adequately:

- Determine turtle catches, spatially and temporally, by gear type; and
- Evaluate the co-distribution of sea turtles and scallop effort to identify time/area ‘hot spots’.

Gear Research – Sea turtle capture in, and escape from mobile bottom gear has been investigated by NMFS over many years of field gear research efforts. Therefore, it is important to involve the appropriate NMFS and Northeast scallop industry gear research experts in studying the operation of scallop dredge and trawl gear. Additionally, the alternatives in Sections 5.3.8.1 and 5.3.8.2 propose to establish a scallop TAC/DAS set-aside program that would include issues associated with protected species interactions. Useful areas of investigation at this writing include:

- Identifying how scallop gear may pose a threat to sea turtles during all phases of operation (towing on bottom, retrieving gear to surface, and towing at surface);
- Developing scallop dredge and trawl operations that would reduce or eliminate the threat of sea turtle capture;
- Developing appropriate escape gear or techniques that may be used without unacceptable reduction in scallop retention; and
- Comparing the turtle capture rates of similar gear in other fisheries such as the Mid-Atlantic summer flounder trawl fishery.

Rationale: In response to reports of sea turtle takes in the sea scallop fishery, NMFS reinitiated consultation under section 7 of the ESA on December 21, 2001. NMFS completed a Biological Opinion (BO) for the scallop fishery as a whole, including the measures included in Framework 15, on February 24, 2003. The BO concluded that the continued implementation of the scallop fishery and the proposed activity may adversely affect but is not likely to jeopardize the continued existence of loggerhead, Kemp’s ridley, green, and leatherback sea turtles. No designated critical habitat was likely to be affected by the fishery. In the BO, NMFS provided an incidental take statement allowing the annual take of 88 loggerhead (up to 25 lethal), 7 Kemp’s ridley (2 lethal), and 1 green (lethal or non-lethal) sea turtles in the sea scallop dredge fishery. In addition, the incidental take statement allows the lethal or non-lethal observed annual take of one loggerhead, Kemp’s ridley, green, or leatherback sea turtles in the scallop trawl fishery.

Many of the alternatives (other than this one) being considered by the Council may reduce the current impacts of the fishing effort conducted under the Scallop FMP on sea turtles, but the cumulative impact (beneficial or adverse) of this amendment will not be known until the preferred alternatives are selected and the final assessment of the overall impact to sea turtles is completed.

The BO completed by NMFS acknowledges that there is insufficient information to determine the full scope of sea turtle and scallop fishery gear interactions because of an overall lack of sufficient data and understanding of the interactions. NMFS is continuing to monitor the observed takes of sea turtles in this fishery and evaluate the potential impact of these interactions, which will require extrapolations of observed sea turtle takes within and outside of the Hudson Canyon and VA/NC Areas. Lacking this information, the Council does not have the benefit of more complete observer data to determine how to best mitigate these takes prior to submitting the draft phase of Amendment 10. Further Council action without such information and careful consideration of all relevant factors could displace fishing effort into areas of higher turtle bycatch than currently exists. The Council, therefore, is currently proposing broad measures for use in future actions that would contribute toward the protection turtles and other protected species. This alternative, however, provides a framework mechanism to mitigate takes of turtles in the scallop fishery and recommends enhanced observer coverage to collect the appropriate protected species

data to better identify the nature and scope of this problem. Further research to provide longer-term solutions is also recommended.

Figure 11

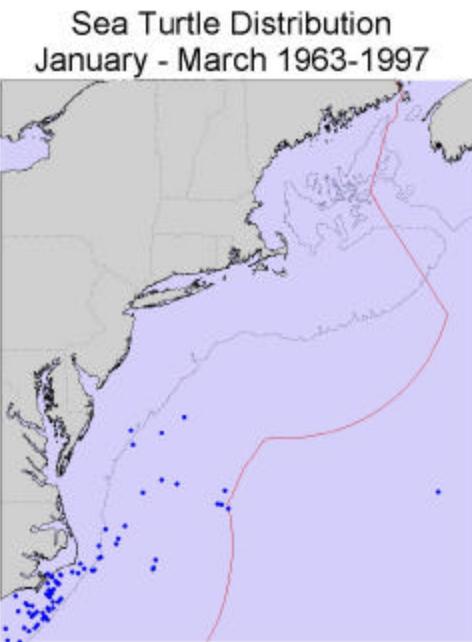


Figure 13

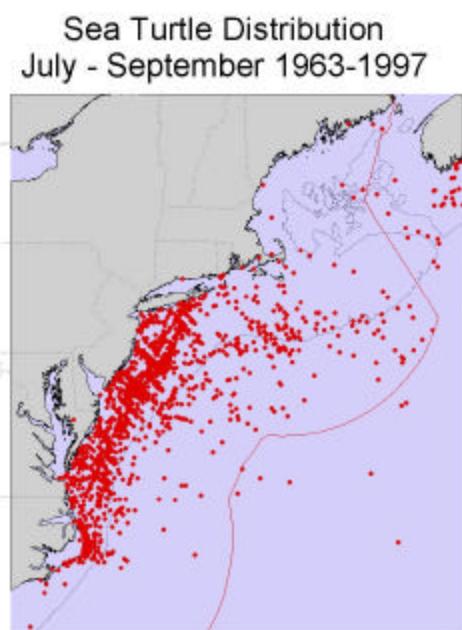


Figure 12

Sea Turtle Distribution
April - June 1963-1997

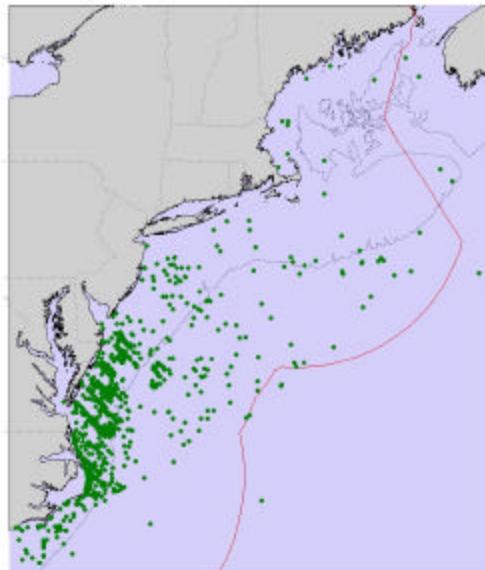
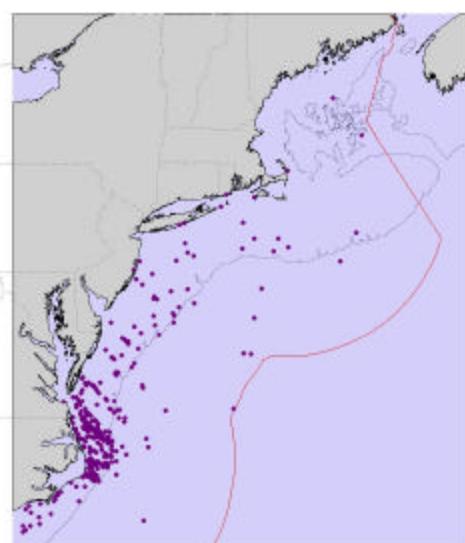


Figure 14

Sea Turtle Distribution
October - December 1963-1997



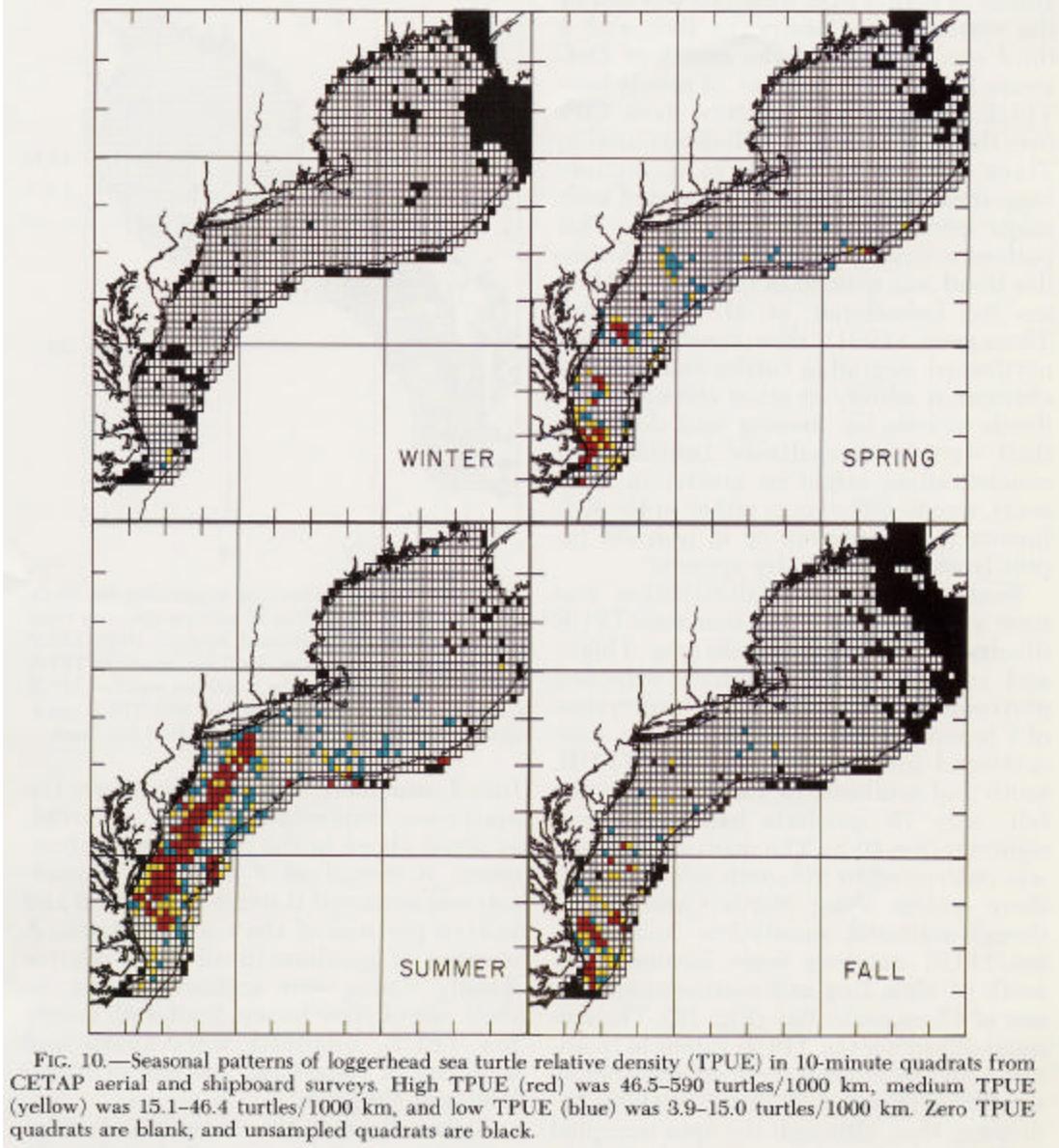


Figure 15. Seasonal patterns of loggerhead sea turtle relative density (TPUE) in 10-minute quadrats from CETAP serial and shipboard surveys.

5.3.5.10 Status quo

No specific action would be taken in the Scallop FMP, including area rotation, 4-inch rings, or gear modifications, to further reduce non-target catches below current levels or below levels that would occur under other management alternatives chosen from Amendment 10. This alternative could also maintain current management measures as sufficient to reduce the likelihood of sea turtle takes.

Rationale : The existing management program, including day-at-sea allocation, crew limits, and possession limits, have effectively minimized bycatch and bycatch mortality to levels deemed practicable.

5.3.6 Alternatives for Managing Scallop Fishing By Vessels Fishing With a General Category Permit or Fishing for Scallops when Not On a Day-At-Sea

5.3.6.1 Incidental catch permit with a reduced possession limit; General category permit for targeting scallops and enhanced reporting requirements and area-specific or overall TACs

A new general category permit would be issued to vessels that intend to target sea scallops, with enhanced monitoring and reporting requirements and a hard (possibly area-specific) TAC. This permit would also enable the Council to allow vessels to access re-opened, managed scallop fishing areas. Vessels that have this permit may target sea scallops with dredges only on declared trips. Vessels with limited access scallop permits would not be eligible for this new general category permit, because the narrower focus of this permit would allow higher days-at-sea allocations for limited access vessels than if the limited access vessels could fish in both permit categories.

A second permit would enable vessels to retain a smaller amount of scallops as bycatch while targeting other species. The intent is to issue this permit to any vessel that is otherwise permitted to use gears that are capable of catching sea scallops, i.e. mobile gear. Vessels may obtain one or both permits to allow them to target sea scallops during some seasons (if they wish) and to retain a smaller amount of scallop catch that they may encounter while targeting other species. This permit would allow the commercial sale of the scallop bycatch, unlike the present personal use (40 lb.) allowance for vessels without a scallop permit.

5.3.6.1.1 General Category Permit

- Permits may be obtained by any fishing vessel that operates a vessel monitoring system (VMS), except a limited access scallop vessel, but must use one or more legal scallop dredges (including 4-inch rings if required for vessels on a scallop day-at-sea using a dredge) that do not exceed 10½ feet in combined width.
- TACs may be area specific or stock wide and trips may be made only while landings by vessels on a general category trip are less than the specified TACs.

Preferred option: TACs should be no more than one to five percent (range) of projected total scallop landings that do not exceed the annual fishing mortality target. The fishing year should be the same

as the fishing year for limited access vessels. If there is a stock-wide TAC, it could be partitioned into quarters to prevent the seasonal landings from one area filling the TAC and limiting the ability to fish for scallops in another area.

- A possession limit would be specified in the FMP and may be area specific. Preferred option: Increase the scallop possession limit to 400 pounds (a single vessel may land no more than 400 pounds of sea scallop meats in a 24 hour period, not to exceed 400 pounds on trips longer than 24 hours. The general category possession limit would be zero for areas where landings from vessels on declared scallop trips have met the TAC or for areas that are closed by scallop management regulations.
- Area restrictions: Vessels may not be in closed scallop areas during declared scallop trips, unless fishing gear is properly stowed. Vessels would be able to fish in controlled access (i.e. re-opened) areas, unless otherwise restricted by future plan amendments or frameworks. In other scallop management areas (i.e. those open to scallop fishing under general rules), vessels with general category permits or not fishing on a scallop day-at-sea would need special exemptions to target scallops on Georges Bank and in the Gulf of Maine, outside of the existing small dredge exemption area.
- Reporting and compliance requirements: Vessels with a general category permit must operate a VMS and declare into the scallop fishery, enabling the enforcement of possession limits, area closures, and TAC monitoring (landings reports). Fishermen must make trip reports, if the VTR program is continued for limited access vessels, or report landings via VMS if the VTR is discontinued. Landings must be reported by dealers and dealers must have a permit. Vessels with a general category permit may be required by the Regional Administrator to carry an observer.

5.3.6.1.2 Incidental Catch Permit

- Any vessel that has a permit to fish mobile gear in the Northeast Region may obtain an incidental catch permit. Mobile gear includes legal trawls, dredges, beam trawls, or any other gear towed from a vessel and capable of catching sea scallops. Vessels permitted to use only gill nets, lobster traps, or hand line, for example would not have a need for an incidental scallop permit and should not be eligible to receive the permit. Vessels with a general category permit may also obtain this incidental catch permit for trips that do not target sea scallops.
- The possession limit should be consistent with normal bycatch levels while fishing for other species. Preferred option: 100 pounds of meats per day-at-sea, not to exceed 200 pounds on a trip.
- Area restrictions: Vessels may fish and retain scallops in any area that is open to fishing for the target species, potentially including areas that are closed for sea scallop fishing. This is similar to the former restrictions for the Hudson Canyon and VA/NC Areas.
- Reporting and compliance requirements: No changes to present requirements unless required by future amendments to other FMPs.

Rationale : This alternative would allow any vessel to obtain a general category scallop permit, target scallops, and possibly fish in re-opened rotation areas. It would limit the total catch by vessels with general category permits to a reasonable fraction of the overall and area specific TACs.

Except for vessels with a limited access scallop permit, any vessel could obtain a re-defined general category permit, which would be associated with a high possession limit, enhanced reporting requirements (including VMS), and access to re-opened scallop fishing areas. Fishing in some or all areas would be constrained by area-specific or overall hard TACs, which would be taken into account as a source of scallop mortality for setting day-at-sea allocations for limited access vessels. Any vessel could also obtain a new incidental catch permit that would be similar to the existing general category permit, but would have a lower possession limit consistent with customary scallop bycatch.

Increasing the scallop possession limit would allow the fleet of vessels with general category permits to fish more economically and be consistent with the change in scallop biomass. During the early 1990s, when the Council selected the 400 pound limit, limited access vessels were catching up to 1,000 pounds per day. Catches in 2001 were around 1,800 pounds per day-at-sea. On one hand, increasing the possession limit would allow vessels with general category scallop permits to operate economically with the higher reporting requirements and VMS equipment. On the other hand, increasing the possession limit would cause the fleet to reach the TAC quicker.

5.3.6.2 Open access for vessels to obtain either an incidental or general category scallop permit; no TAC would apply except possibly in re-opened scallop management areas; possession limits for each open access permit

Like the above alternative in Section 5.3.6.1, two open access permits would be created: an incidental catch permit with a low scallop possession limit and a newly-defined general category permit for vessels that target sea scallops while not on a scallop day-at-sea.

The new general category permit would be issued to vessels that intent to target sea scallops and vessels with this permit must participate in a call-in system to track fishing activity. The vessel operator would have to call in and report any trip that exceeded the incidental catch possession limit described below. Once the vessel exceeded 45 days of scallop fishing trips under the permit or if the vessel fishes for sea scallops in a re-opened rotation area, the vessel would be required to operate VMS equipment in lieu of the call-in requirement. No TAC would apply to landings by vessels with a general category permit fishing for sea scallops under the call in or VMS program. There may be a TAC set aside in re-opened rotation management areas, however. Depending on the final option chosen by the Council, vessels with a limited access scallop permit may or may not be eligible for this permit.

A second permit would enable vessels to retain a smaller amount of scallops as bycatch while targeting other species. The intent is to issue this permit to any vessel that is otherwise permitted to use gears that are capable of catching sea scallops, i.e. mobile gear. Vessels may obtain one or both permits to allow them to target sea scallops during some seasons (if they wish) and to retain a smaller amount of scallop catch that they may encounter while targeting other species. This permit would allow the commercial sale of the scallop bycatch, unlike the present personal use (40 lb.) allowance for vessels without a scallop permit.

5.3.6.2.1 General Category Permit

- Permits may be obtained by any fishing vessel. Vessels that call in a scallop trip under general category rules must use one or more legal scallop dredges (including 4-inch rings) that do not exceed 10½ feet in combined width.

- Option 1 – Vessels holding a limited access scallop permit at any time during the fishing year would not be eligible for a general category scallop permit or be eligible to target scallops while not on a scallop day-at-sea.
 - Option 2 – All vessels would be eligible for a general category scallop permit and limited access scallop vessels would be authorized to fish for and retain up to the possession limit allowed for vessels having a general category scallop permit.
- The Council may by framework adjustment specify a general category TAC for re-opened rotation management areas according to the area's relationship to ports with general category vessels and/or the history of scallop fishing by vessels without limited access scallop permits in such area. Otherwise, a TAC for scallop landings by vessels with general category permits would not apply.
- A possession limit would be specified in the FMP and may be modified by framework action for re-opened rotation management areas.
Preferred option: Continue the 400-pound possession limit (a single vessel may land no more than 400 pounds of sea scallop meats in a 24 hour period, not to exceed 400 pounds on trips longer than 24 hours. Vessels that exceed 45 days of scallop fishing or that apply to fish in re-opened scallop rotation management areas would be allowed to retain and land a greater amount of scallops, set by future framework that re-opens scallop rotation management areas. The general category possession limit would be zero for areas that are closed by scallop management regulations.
- Area restrictions: Vessels may not be in closed scallop areas during declared scallop trips, unless fishing gear is properly stowed. Vessels that operate VMS equipment would be able to fish in scallop managed (i.e. re-opened) areas, unless otherwise restricted by future plan amendments or frameworks.
- Reporting and compliance requirements: Vessels with a general category permit may not land more than the incidental permit scallop possession limit, unless the vessel operator participated in the general category call-in program to report his intent to fish for scallops. Vessels whose scallop fishing trips reported in the call-in program exceeded 45 days and vessels that fish in re-opened rotation management areas must continuously operate VMS equipment with the same polling frequency that applies to limited access vessels with VMS equipment.

Fishermen must make trip reports, if the VTR program is continued for limited access vessels, or report landings via VMS if the VTR is discontinued. Landings must be reported by dealers and dealers must have a permit. Vessels with a general category permit may be required by the Regional Administrator to carry an observer.

5.3.6.2.2 Incidental Catch Permit

- Any vessel that has a permit to fish mobile gear in the Northeast Region may obtain an incidental catch permit. Mobile gear includes legal trawls, dredges, beam trawls, or any other gear towed from a vessel and capable of catching sea scallops. Vessels permitted to use only gill nets, lobster traps, or hand line, for example would not have a need for an incidental scallop permit and should not be eligible to receive the permit. Vessels with a general category permit may also obtain this incidental catch permit for trips that do not target sea scallops.
- The possession limit should be consistent with normal bycatch levels while fishing for other species.
Preferred option: 100 pounds of meats per day-at-sea, not to exceed 200 pounds on a trip.

- Area restrictions: Vessels may fish and retain scallops in any area that is open to fishing for the target species, potentially including areas that are closed for sea scallop fishing. This is similar to the former restrictions for the Hudson Canyon and VA/NC Areas.
- Reporting and compliance requirements: No changes to present requirements unless required by future amendments to other FMPs.

Rationale : This alternative would allow any vessel to obtain a general category scallop permit, target scallops, and possibly fish in re-opened rotation areas. Requiring less active fishing vessels with general category permits to continuously operate VMS equipment would be inconsistent and inequitable if vessels with occasional limited access permits were not also required to operate VMS equipment.

The enhanced reporting requirements are needed to monitor fishing effort in a re-opened rotation management area and for the more active scallop fishing vessels with a general category permit. Participation in a less-burdensome and costly call-in system would be needed to monitor fishing activity of a vessel and determine when it reaches the activity level that requires VMS operation. A sector TAC would only apply to some re-opened rotation areas and would not create a derby-style fishery in other open fishing areas.

5.3.6.3 Prohibit vessel with limited access scallop permits from targeting scallops under general category rules when not fishing on a scallop day-at-sea

Unless exempted under the state waters exemption program, (50 CFR, §648.54), vessels holding a limited access scallop permit during a scallop fishing year will be subject to the open access sea scallop possession limit (50 CFR, §648.52(b), presently 40 lb. (18.12 kg) of shucked, or 5 US bu. (176.2 L) of in-shell scallops. Thus, 50 CFR §648.52(a) would no longer apply to vessels holding a limited access scallop permit during the fishing year, but the regulation would remain unchanged for all other vessels.

Rationale : An increasing number of limited access scallop vessels have begun targeting scallops while not on a scallop day-at-sea, landing up to 400 lb. of shucked scallop meats. About 2/3^{rds} of the total sea scallops landed in 1999 on trips with less than 400 lbs. originated from vessels having a limited access scallop permit (Table 17; NEFMC 2000). Since all sources of mortality must be taken into account to prevent overfishing, higher landings by vessels not on a day-at-sea would result in lower day-at-sea allocations for all limited access scallop vessels. Thus, it could create a competitive situation where more limited access vessels target sea scallops while not on a day-at-sea to compensate for lower day-at-sea allocations caused by vessels targeting sea scallops while not on a day-at-sea.

Without establishing different permits for vessels targeting sea scallops under general category rules and those landing sea scallop bycatch while targeting other species, it would be difficult to ensure compliance without resorting to a limit as a percentage of the total catch on board. Since scallop bycatch mortality is usually low, it may be far simpler and cost-effective to simply prevent limited access vessels from fishing under general category rules.

Applying this alternative to a vessel that held a limited access permit at any time during the fishing year would prevent vessel owners from frequently converting the permit to a Confirmation of Permit History to target scallops with a general category permit during the same fishing year.

5.3.6.4 Status quo

Any vessel could obtain a general category scallop permit and land up to 400 pounds per day or trip, whichever is less. Vessels with a limited access scallop permit would be eligible to fish for scallops and land up to the scallop possession limit while not on a scallop day-at-sea.

Rationale : The current general category permit provisions, including possession limit and considerations of access to re-opened areas, is sufficient to manage, monitor, and assess the general category portion of the scallop fleet..

5.3.7 Alternatives for Improving Data Collection and Monitoring

5.3.7.1 Adequate observer coverage and funding by day-at-sea or TAC set aside

This alternative would continue the successful practice of providing compensation for industry funded observer coverage and would allocate a portion of the scallop TAC(s) and or DAS in order to allow vessels to recoup the cost of carrying observers. It is intended to help achieve a target level of sampling to yield for a statistically adequate level of coverage, and to determine bycatch with an accuracy appropriate to the scale at which the bycatch information will affect management decisions.”

Rationale : Increased observer coverage is necessary to monitor TACs for scallops, to help quantify the amount of finfish bycatch in order to better comply with National Standard 9, and to determine the level of sea turtle takes in the scallop fishery. Because the increase in observers would be costly and may not be entirely within the capabilities of NMFS to pay for such increases, the TAC and/or DAS set-asides would allow compensation to vessel owners and crews which have paid for observers. This program has proven to be successful in limited applications under the Georges Bank Closed Area Exemption Programs in 1999 and 2000 and under the Mid-Atlantic Area Access Program implemented in 2001, 2002.

5.3.7.2 Bag tags and standard bags – Alternative 1

The need for bag tags has arisen with the need to enforce possession limits. Possession limits exist in the scallop fishery in the general category (400 pounds) and possibly in the limited access vessel category as a tool to control removals from special management areas. The bag tag is a means to provide accountability to the scallops after they leave the harvesting vessel until some point of first processing.

In the January 8, 2002 NMFS Enforcement Guidance there was the recognition that enforcement would be enhanced if fish were accountable and traceable throughout the wholesale process. The scallop industry understands and supports this need, and believes that the accountability and traceability must begin on the harvesting vessel. The simplest step would be to require all bags of scallops to be labeled with a tag that identifies the landing vessel and permit number. Additional tag information could include a landing date, unique identifying number, and the meat count. Kevlar tags are available on the market today for about \$50/1000. The **primary purpose** of the tag is to maintain accountability after the scallops leave the possession of the harvester until the first point of wholesale processing. Individual bags of scallops, commonly weighing 50 pounds, have a value of about \$250.00; a bag of U-10's about \$350.00.

A bag tag system that would be utilized for controlling landings may require a standard bag size. A common bag used today is made of a piece of linen cloth, measuring 25 inches by 34 inches, folded

over and stitched on two sides to form an open ended bag that will hold 50 pounds of scallops. A specification could be written stating that a bag had to measure no more than 17 x 24 inches between seams and that a standard bag should weigh when filled no more than 50 pounds with a 10% tolerance. The enforcement protocol of a bag measurement should not differ from the enforcement of a mesh size. In practice, it is easier as a filled bag does not need to be measured unless the weight (w/tolerance) is observed to be exceeded; a clear violation. In effect, the bag measurement is secondary to the weight limit.

The weight limit is easy for a vessel crew to comply with as long as crews do not try to play the tolerance too close. Currently, with possession limits there is a tendency for a complying vessel to loose catch if they take a precautionary approach in determining the amount of scallops onboard. In a system with a 10,000 pound possession limit a good crew, trying to insure they are in compliance, will usually land a catch several hundred pounds below the limit. A crew that isn't worried about dockside checking will land several bags (or more) above the limit, record the 10,000 lb landing and move the extra bags over the dock quickly to the cooler. In a bag tag system, a crew knows it can land 200 bags without fearing an overage due to the tolerance. A complying crew may end up landing several hundred pound more than the possession limit due to playing the tolerance conservatively. However, moving the illegal scallops over the dock fast has a much greater chance of being caught because the enforcement agents do not have to be present during the entire unloading sequence; they can arrive late and check coolers, fish boxes, and pick-up trucks. Bag tags should reduce the economic incentive to land illegal scallops.

A bag tag system would require that the tag remain with the scallops until they are re-packaged or consumed. A bag tag system will also have to allow vessels to land a packaged product that differs from the conventional bag.

5.3.7.3 Bag tags and standard bags – Alternative 2

5.3.7.3.1 Background

Amendment #10 may manage with “open areas managed by DAS” and “controlled access to Closed Areas with DAS and trip limits”. Amendment #10 should contain measures to increase the level of accuracy of landings and catch monitoring.

It is not clear whether in the long term scallop management will continue solely with DAS management or continue to evolve to a hybrid with special management areas coupled with trip limits. Management by DAS in the long-term means the industry is tied to inefficient methods of harvest and reduces the ability of the industry to make and sustain profits, but it is relatively easy to monitor through DAS reporting by Boatracs. Management by trip or catch limits allows the industry flexibility and enhances safety, without affecting the biological goals of the Scallop plan, thereby enhancing long term profitability and the industry’s long term sustainability, but trip limits change the needs of enforcement. Unless trip and catch limits are easily enforceable and NMFS is able to easily monitor a plan based partially on trip limits; the catch limits could easily be violated and the biological goals of the plan thwarted.

NMFS has developed precedents for monitoring catches utilizing outside vendors to provide services to Industry and NMFS in both the Boatracs system and the surf clam / quahogs cage tag system. Annually limited access surf clam and quahog owners receive a NMFS Letter of Authorization permitting them to purchase from an NMFS approved vendor a specific number of pre-numbered and color coded clam cage tags. If the limited access surf clam/quahog owner wishes to harvest he must pay to the vendor for the tags. In the clam industry NMFS specifies that a clam cage must be a standard steel cage 3 feet by

4 feet by 5 feet. Each full cage weighs over 3,000 pounds and is not easily transportable or converted into cash. Scallops are handled in 50-pound bags easily transported and easily turned into cash. It might be much better to monitor scallops through a NMFS authorized standard and pre-marked bag, which by its nature would be standard and would not be able to be reused. Also NMFS currently sets the specifications for vessel tracking, which are provided by an outside Vendor (Boatracs), but whose costs are borne by the Vessel owner and are a condition of the management and enforcement plan. In fact, the Boatracs unit can be integrated into a reporting plan for scallop catches and landings to lower the cost of landing and trip limit monitoring in conjunction with Standard NMFS authorized Scallop Bags.

Goal

Since Amendment #10 may be a hybrid plan of both DAS management and area specific trip limits we should include in Amendment #10 a monitoring system, which will allow managers and enforcement to test whether an effective trip limit could be fully implemented and easily monitored in the Scallop fishery. Since scallops are easily transported in small quantities and easy to turn into cash, the system must be established to thwart cheating. In addition, the costs of the enforcement plan should be primarily borne by the industry with little added costs to NMFS.

Proposal

All fresh shucked scallop meats (other than a maximum of 50 bushels of shellstock per trip or sea-frozen) must be landed only in standard NMFS pre-marked and pre-numbered scallop bags. NMFS will competitively bid for one or more vendors to produce and supply scallop bags to the industry. Limited access scallop vessels can only land scallops in these NMFS specified bags. The Scallop Harvesting Industry must buy their bags only from NMFS approved vendors. The annual specifications for the bags will include:

- 1) Standard material and size
- 2) Serial numbering system
- 3) Different color print for each specific harvest area (i.e. if one year we are allowed to harvest in open areas, Hudson Canyon, and Nantucket Lightship there would be three different color printings to help identify the harvest area).
- 4) Annually NMFS would provide to each limited access permit holder a letter of authorization permitting them to purchase a fixed amount of pre-numbered bags for each controlled opening of Closed Areas and pre-numbered bags for the open areas.
- 5) The scallop limited access vessel owner would provide a their letter of authorization to purchase scallop bags to the approved vendors and pay for the bags they receive. It is the vessel owners' duty to protect and take care of their bags.
- 6) General Category scallop vessels must land all scallops in NMFS authorized bags, but General Category scallop vessel owners can only purchase pre-numbered color-coded bags for the open areas. Only permitted vessels can purchase NMFS Authorized Standard Bags.
- 7) The approved vendors would periodically (weekly) report to NMFS all bags sold to both Limited Access Scallop Permit holders and to General Scallop permit holders.
- 8) It is illegal to land any scallops, other than in these standard pre-numbered bags. Catch limits will be issued not in pounds but in total of bags that can be landed from specific areas. (I.e. assuming the standard bags averaged 50 pounds rather than having a catch limit of 30,000 pounds for a specific area or trip the vessel would be approved to purchase and land 600 pre-numbered and color-coded standard scallop bags.)
- 9) It is illegal for a dealer to purchase scallops from either limited access or general access scallop vessel unless they are in standard issue bags with all serial numbers landed weekly being reported to NMFS by the dealer.

- 10) All limited access scallop vessels must notify NMFS enforcement by Boatracs Macro message at least 4 hours prior to crossing the demarcation line of the number of and serial numbers of all bags to be landed, the proposed port of landing, and the proposed dock for offloading. This will provide NMFS (and their state enforcement partners) with sufficient opportunity to randomly monitor a small number of landings (5%?). With random monitoring there will be little chance of cheating.
- 11) All scallop offloading must take place between 7:00 a.m. and 6:00 p.m. Monday through Friday, and may optionally include Saturday and Sunday.
- 12) Shucked scallops onboard a vessel and stored in a cooler, pen, or below decks must be contained and sealed in standard bags designated for the area where the vessel caught the scallops. Vessels may only have one type of standard bag onboard the vessel. Since in Amendment 19 we will be working on a hybrid system, some of the catches will come from areas with no trip limits (only DAS controls) and some of the catch from Closed Areas with trip limits, it will be illegal to have any other type of scallop bag (other than those pre-numbered and color coded for that trip) on the vessel when it is on the trip and offloading.
- 13) If a vessel wishes to freeze at sea they must apply for a special permit to freeze at sea. Similar to clam processing at sea they must provide a plan to NMFS specifying standard packaging of the final product. Vessels freezing at sea would be required to contract with an approved NMFS vendor to have each offloading monitored. The cost of this NMFS approved monitoring would be borne by each vessel freezing at sea as part of their approval for their special permit.

5.3.7.4 Require vessels to make daily reports of vessel trip report (VTR) data through the vessel monitoring system (VMS)

All data currently reported through VTRs would be reported on a daily basis through VMS equipment, to enable real-time monitoring. This includes data on the vessel, gear, crew, location fished, and haul weights of amount kept and discarded by species and three-digit area.

Rationale : Reporting by VMS equipment will improve the timeliness of data for real time monitoring of TACs. Higher VMS costs could be offset by eliminating the costs associated with vessel trip reports. Failure to make reports can be flagged immediately.

5.3.7.5 Replacement of vessel trip reports (VTR) with effort reporting via VMS, real-time landings reporting by dealers, and discard characterization by enhanced observer coverage.

Vessel, gear, the amount of scallop bags retained, and crew data would be reported for each trip by VMS, which also records location fished. Landings would be reported by dealers, although landings estimates could also be reported through the VMS at the end of trips. Discard estimates would be made from more-reliable sea sampling, enhanced through a TAC/day-at-sea set aside to recompense vessels for their observer expenses.

Rationale : Vessel trip report data collection would be replaced by more efficient and reliable systems, requiring vessels to make reasonable daily reports via VMS equipment. Costs of daily reporting via the VMS could be entirely offset by eliminating costs associated with vessel trip reports. Unreliable discard data would not be collected, since vessels rarely report discards and when it is reported, it is usually incomplete.

5.3.7.6 Require all limited access vessels to operate a vessel monitoring system (VMS)

Vessels with limited access occasional scallop permits would be required to obtain and operate VMS equipment, consistent with the regulations that apply to part-time limited access vessels and to new requirements for vessels with a re-defined general category permit.

Rationale: Only occasional scallop permits are allowed to report limited access scallop trips via call in, rather than operate a VMS. If vessels with general category scallop permits are required to operate VMS equipment, it would be inequitable if other vessels that seasonally target scallops on a day-at-sea were exempt from this requirement. This is especially true, since some fishermen with general category permits decided not to apply for limited access due to the record keeping requirements to prove eligibility, even though some general category vessels might have qualified for an occasional limited access scallop permit.

5.3.7.7 VMS Suppliers

NMFS would be encouraged to secure and certify two or more vendors of vessel monitoring system equipment.

Rationale : Competition among vendors is expected to make pricing competitive and spark innovation. NOAA Fisheries Enforcement is currently evaluating a new VMS unit (Thrane and Thrane (TT) 3026). They are on schedule with our rollout of the SmarTRAC platform and the TT-3026 transponder. The internal system changes required to support Inmarsat-C transponders are also proceeding well. Static testing and general familiarization with the TT-3026 has been completed. Specific setting of the firmware and the deployment plan are in progress but still need to be completed. Final testing of the new unit is expected to be completed by March 2003.

5.3.7.8 Scientific resource surveys conducted with industry vessels and crew, funded by the TAC/day-at-sea set-aside and authorized as scientific research

Cooperative surveys involving scientists and industry could be conducted under a scientific permit, without requiring an experimental fishing permit. Vessels participating in the surveys could be compensated under the rules for the TAC/day-at-sea set-aside program.

Rationale : Industry-funded and supported resource surveys are needed to increase the sampling intensity and support area rotation, especially if many small areas need to be evaluated to close or open rotation management areas.

5.3.7.9 Status quo

No change in the existing reporting requirements for vessels with limited access or general category scallop permits.

Rationale : If area rotation is not adopted, the present amount of reporting and monitoring could be adequate.

5.3.8 Alternatives for Enabling Scallop Research

This section describes how scallop research would be managed in the Scallop FMP, utilizing a set-aside of day-at-sea allocations or a portion of the total allowable catch (TAC). For cooperative research projects funded by the set-aside, the Council would establish priorities in Amendment 10 and through decisions made by the Council's Research Steering Committee (Section **5.3.8.1**) or during the framework adjustment process (Section **5.3.8.2**).

Whether funded by the set aside or by other sources, this section also describes the type of research that may be conducted under an Experimental Fishing Permit, without preparing an Environmental Assessment (EA) or Environmental Impact Statement (EIS). To qualify for this exemption from the normal application procedures, the research must not cause mortality or impacts that differ from that created by normal scallop fishing on a day-at-sea (Section 5.3.8.2.2). Research projects that are not conducted on a day-at-sea (an allocated day or a set-aside day), in areas that are otherwise closed to scallop fishing, or using gear that is otherwise prohibited while fishing for sea scallops would be required to follow the normal application procedures (Section 5.3.8.3).

Nothing in the alternatives in this section is intended to supercede the requirements of the Magnuson-Stevens Act provisions with respect to experimental (exempted) fishing activity. Rather, the alternatives in this section are intended to incorporate the requirements of the Magnuson-Stevens Act provisions into the Amendment 10 process or into future specification or framework processes in order to facilitate future research. Based on the analysis contained herein and associated with a customary scallop fishing day, the applicant may be relieved of preparing an EA or EIS for a research application. If the research is deemed to have greater impacts, however, these procedures may require the applicant to prepare an EA or EIS to be authorized to conduct the research.

5.3.8.1 Process for managing research funded through scallop TAC or day-at-sea set-aside.

5.3.8.1.1 Identification of Research Priorities

The Council's Research Steering Committee would recommend research priorities to be included in Amendment 10. Research priorities should be broad in order to include a sufficient range of potential research proposals, including those related to protected species interactions. These research priorities would be evaluated and modified periodically by the Research Steering Committee and included in the list of desired research when the Council issues a request for proposals (RFP).

5.3.8.1.2 Resource Surveys - #1 Priority in Amendment 10

Resource surveys conducted to determine appropriate areas to close or reopen under Amendment 10's area rotation program would be the #1 research priority in Amendment 10. Resource surveys will be scientific research, although some projects may be considered experimental fishing if the vessels involved land a portion or all of their catch, even though the design of the project is purely scientific. Alternatively, scallops landed during scientific research cruises could be considered also a compensation trip covered by the TAC and/or DAS set-aside. Resource surveys should not be superceded by other types of research. Therefore, the overall research TAC set-aside would contain a portion specifically for the resource surveys that could not be used to compensate any other type of research. The PDT indicated that it favored a pre-determined amount of set-aside, rather than a percentage of the overall TAC/DAS that would change over time.

5.3.8.1.3 Identification of Types of Research, When, Where, and Under What Conditions Research will Occur and Inclusion of Analysis of the Research in Amendment 10

The identification of the type of research, and when, where and under what conditions research will occur in Amendment 10 will provide the ability to include detailed and complete NEPA (and other applicable laws) analyses in the Amendment. This would provide for research to be authorized without the lengthy and difficult separate EFP process. These determinations can be broad if the analyses leave researchers enough flexibility to submit requests for a wide range of projects under a type of research. It should also allow researchers to be flexible in when and where their research would take place as well as in the conditions of their research. Anyone with a proposal that does not fit within the parameters set in Amendment 10 would have to go through the EFP process (and prepare their own analysis of impacts).

5.3.8.1.4 Establishment of Set-asides of Scallop Resource and DAS for Funding Research

Amendment 10 would set aside a portion of the TAC (where TAC is used) and/or DAS for compensating researchers and/or vessels for projects they complete. Amendment 10 would create a pool of \$3 million per year (about 1 to 2 percent of the total yield at current biomass levels) to fund compensation for fishing under the set aside and for conducting the approved research. Allocation of the TAC and/or DAS set-asides requires that the selection of researchers to receive compensation is competitive. Currently, the RFP process is the only method that can be used. Amendment 10 should include the RFP process, but the RFP should not wait until Amendment 10 is final. Once the final EIS is in preparation, the RFP should be issued so that there is sufficient time to get proposals in.

5.3.8.2 Alternative Process for setting research priorities

An alternative would be to identify and analyze specific research projects in annual, bi-annual, or other period, adjustments. This process has been proposed in the Mid-Atlantic's Framework 1 action for all of their managed species (except Surf/Clam and Ocean Quahog and Dogfish FMPs). The major difference in the Mid-Atlantic's action is that the Framework set up the process and the first implementation of research set-aside use would come during the first specifications-setting process after the framework is implemented. Because Amendment 10 will need to implement a process that allows research to occur immediately, at least initially the process won't work. However, it could fit in with the annual adjustment process or specification process under Amendment 10.

Amendment 10 would be implemented as described above, with pre-determined research goals, priorities, descriptions of the types of projects, descriptions of where, when and under what conditions research will occur, and full analyses of the impacts of the anticipated research. Applicants would submit proposals under a competitive process (RFP issued well in advance of Amendment 10 approval date) and research period would be from implementation of Amendment 10 through the first adjustment of research priorities etc. that would be required at the first annual framework or specification.

The framework would then be set up as follows (modeled after Mid-Atlantic's Framework 1 to all but dogfish, surf clam and quahog):

- Research Steering Committee, in consultation with the Council's Scallop Oversight Committee, would recommend new research priorities, if necessary. These research priorities, to ultimately be

funded via the sea scallop TAC research set-aside, could include but are not limited to the following areas of investigation:

- ❖ Research on scallop biology and scallop fishery social science, including ways to improve benefits to the fishery
- ❖ Research on habitat effects from scallop fishing and identify practicable methods to minimize those impacts
- ❖ Research to identify the extent of and possible remedies to interactions between sea turtles and scallop fishing gear.
- Based on Research Steering Committee and Scallop Committee recommendations, the Council would forward an RFP to NMFS to be published immediately requesting submission of proposals prior to the development of the first framework. Requests for set-asides would be based on pre-determined amount established in Amendment 10. RFP would identify an expected average price of scallops for proposals to be based on. The RFP process would take about two months (30 days for applicants to submit proposals, 30 days to approve at RA level).
- Based on the Council recommendations, the Regional Administrator would approve Experiments/Research proposals to be submitted to NMFS headquarters for grants approval prior to development of the framework document (prior to first framework meeting).
- Council develops framework including research projects recommended by the Regional Administrator for approval under the RFP. Each proposal is analyzed in the framework.
- NMFS publishes final rule for framework implementing new measures and authorizing research and compensation.

The development of a SAFE document would be coordinated within this process to recommend research priorities, or aspects of research (when, where, under what conditions), to the Council. Changes in the TAC set-asides could also be included in the SAFE recommendations. However, the timing of preparing the SAFE to coordinate with this process may be tricky in that it would have to be done with enough time to put out the RFP and have proposals approved by the RA in time for the first framework meeting.

This process would not include resource surveys to determine what areas to open and/or close since these surveys are more likely to remain constant in design, particularly for consistency in data gathering and standardization of scientific methods.

The Mid-Atlantic's version is new and it remains to be seen how effective it will become. In concept though, it would address some major concerns:

- Allows flexibility for research over time - does not lock research into box created in Amendment 10.
- Provides the ability to determine the appropriate amount of research set-aside when adjustments are done.
- Allows Council and NMFS to analyze the impacts of research projects in the adjustment rather than the researcher being tasked to do this.

- RFP process is done well in advance of the implementation of an adjustment so researchers do not have to wait to do research after a framework or amendment is implemented.
- Allows for more diverse research since more proposals could be expected over time.
- In theory establishes a “boiler plate” RFP to expedite future RFPs.

5.3.8.2.1 Other considerations and definitions

Scientific Research versus Experimental Fishing

Scientific research is not considered fishing, as defined by the Magnuson-Stevens Act, and is therefore not subject to the restrictions of the Magnuson-Stevens Act. Scientific research must be conducted by universities (or other accredited educational institutions), foreign governments, U.S. state agencies, Federal agencies, international treaty organizations, or scientific institutions. A scientific research vessel does not have to be a NOAA Research Vessel. However, to be considered a scientific research vessel, a vessel (including fishing vessels) must be under contract with and under the control of a university (or other accredited educational institutions), foreign government, U.S. state agency, Federal agency, international treaty organization, or scientific institution. Scientific research includes survey cruises designed to investigate behavior, disease, aging, growth, migration, recruitment, distribution, abundance, ecology, stock structure, etc. Photographic studies would be considered scientific research, as would sediment sampling and other types of surveys to study a resource’s environment. Fishing gear studies are not considered scientific research. Experimental fishing, on the other hand, is considered fishing activity and is therefore restricted by the Magnuson-Stevens Act. Experimental fishing may not occur without approval by the National Marine Fisheries Service. Experimental fishing may include such things as market development for a species; gear selectivity studies; and gear efficiency to name a few. Any activity that can reasonably be considered fishing, and that is not an activity designed to further the scientific knowledge of a species and its environment, will be considered experimental fishing. In addition, if a vessel is conducting scientific research, but is also conducting fishing operations (to supplement or “fill time”), or is landing a portion or all of its catch, an EFP may be required to cover these fishing activities.

The Magnuson-Stevens Act allows for compensation trips to cover the expenses of scientific research as well as experimental fishing as seen in Frameworks 13 and 14 to the Scallop FMP. Compensation trips are allowed by NMFS through regulation and generally have to be covered by a letter of authorization. This includes landing of fish for compensation as part of a scientific research trip. Compensation for scientific research and experimental fishing has been a difficult and time-consuming task because it requires authorization by NMFS for a vessel to take a portion of a fishery resource. In turn, this requires that NMFS use grants process to approve compensation trips for research since NMFS is allocating resource (which converts to dollars).

The experimental fishing permit (EFP) process is also time-consuming and difficult, particularly for the applicant. The applicant must allow 60 days for an application to be processed by NMFS, and must consider the impacts of the project on the environment. The probable cumulative effects of experimental fisheries has made it more likely that some larger-scale projects require Environmental Assessments (EA) under NEPA. Most applicants are not familiar with the EA process and requirements. The completion of appropriate analyses and the EFP process can delay the start of a project beyond the applicant’s original anticipated start-date.

Goal of Amendment 10 with Respect to Research

In order to provide for compensation of both experimental fishing and scientific research, Amendment 10 should allocate scallop resource through an allocation of scallop biomass and/or DAS dedicated to scallop research. Also, in order to facilitate experimental fishing, Amendment 10 should establish a process to analyze and approve experimental fishing projects under a set of research priorities without needing to go through the EFP process and analysis of impacts for each proposal.

To achieve this goal, the PDT identified the following issues that need to be addressed to facilitate research in Amendment 10:

- Identification of research priorities.
- Resource surveys to base area rotational management decisions #1 priority.
- Identification of types of research to be conducted under Amendment 10 with analysis in SEIS.
- Identification of when, where, and under what conditions experimental fishing will take place.
- Establishment of set-asides of scallop resource and DAS for funding research.
- Identification of a modification of the grants procedure to facilitate approval process ³⁶.
- Provide the ability to modify research priorities, types of research, details of research, analyses of research, and set-aside amounts.

5.3.8.2.2 Research activities (including compensation) that have impacts and mortality no greater than and similar to those caused by a conventional commercial fishing trip using the associated TAC or day-at-sea for normal fishing activities; analysis of impacts of research necessary for supporting area rotation

The Amendment 10 DSEIS analyzes the effects the target scallop mortality rates and of the allocation of day-at-sea, trips, and/or TAC. By definition, a set-aside would reduce environmental impacts below those that are analyzed in the SEIS and any research conducted under the set-aside and complies with the fishery regulations would be within the scope of effects analyzed in the EIS for the FMP. Research projects included are those conducted during a normal scallop fishing trip, during trips taken under set-aside days (see above), or during trips that do not cause additional scallop or bycatch fishing mortality, or have other effects (habitat, economic and social impacts, etc.) beyond that estimated to occur from the fishing effort allocations in the FMP. Researchers could rely on this analysis to justify and report the effects in experimental fishing permit applications for compliant trips.

Types of research activities that would automatically be considered as analyzed by the SEIS are:

- Research that causes negligible mortality and disturbance of the sea floor, such as video surveys.
- Research that uses unmodified commercial fishing gear or commercial fishing gear that causes less mortality or disturbance of the sea floor, such as:
 - Paired tow comparisons using gear that complies with existing fishing regulations.

³⁶ There is no other process that is currently available to authorize the allocation of portions of the resource or DAS. The RFP process for TAC set-asides was developed in conjunction with Framework 13 and discussions to use other processes were not productive. This priority is not considered in the discussion of the priorities included in this segment.

- Resource surveys with unmodified commercial dredges or trawls.
- Tagging of animals caught by gear that complies with existing fishing regulations.
- Observation of discard mortality during regular commercial fishing.
- Retention of catches that exceed a possession limit, unless it exceeds the amount associated with a TAC or DAS set aside.

Not included is research that:

- Uses commercial fishing gear that does not comply with existing regulations
- Requires fishing in closed areas
- Requires fishing on a day that exempt from the DAS regulations, except as provided for in a TAC or DAS set aside program.
- Uses liners or other gear that increases retention of scallops or non-target species, unless accounted for by a TAC or DAS adjustment under a set aside program.

Rationale : Impacts of experimental fishing that are no greater than those expected on a standard commercial fishing trip can be estimated, anticipated, and evaluated in the Amendment 10 DSEIS. The various effects of this character of experimental fishing programs would furthermore be accounted for in the mortality controls on the commercial fishery. Experimental fishing proposals that exceeded this level would be difficult to anticipate and hard to analyze in advance, without knowing the details of the proposed experimental fishing activity.

5.3.8.3 Status quo: Research funded through grants and contracts; research proponents may have to prepare an EA or EIS

Research and experimental fisheries that increase fishing mortality or have other effects beyond what is anticipated by the FMP and analyzed in the DSEIS may be authorized through the existing experimental fishery application process or as scientific research. These projects may be required to have an environmental assessment (EA) or environmental impact statement (EIS), depending on the nature of the proposed research. This is the existing process for approving experimental fisheries or scientific research.

Rationale : The existing process is necessary and works sufficiently well to permit some types of experimental fishing permits, especially if an associated environmental impact statement is prepared.

5.3.9 Alternatives for Adjusting Management Measures

The present framework adjustment process is very consuming of time and resources. The frequency of these management actions also introduces considerable uncertainty about the future management effects. The following sections describe several management options to address various issues and problems associated with the current process.

An area action notice (Section 5.3.9.1) would allow for a rapid response to close areas with high abundance of small scallops. This process could occur by itself, initiating a Notice Action to effect a closure or it could be combined with an annual specification or framework adjustment when the timing works out to do that. An annual specification process (Section 5.3.9.2) would allow for minor “corrections” to the level of allocations or other management measures during the “off” year if the framework adjustment process is changed to a two-year cycle. The routine or schedule framework

adjustment (Section 5.3.9.3) could remain the same as the present system, but it could be streamlined by changing the fishing year (Section 5.3.9.4) to a time that is more compatible with when the survey data becomes available for analysis.

A framework adjustment cycle that is longer than one year is not new. Amendment 4 initially adopted a three-year framework adjustment cycle, primarily to allow time for new management measures to take effect, be monitored, and be analyzed for the upcoming adjustment. Amendment 7 changed the process to an annual cycle because of considerable uncertainty about the level of allocations needed to meet the new, lower mortality targets. We now seem to have a better understanding and ability to forecast these management needs and the probable effects, possibly allowing a greater time between major plan adjustments.

5.3.9.1 Scallop harvest area action notice to close areas

In-season actions that close rotation areas to scallop fishing, in accordance with a pre-established area rotation policy analyzed in an EIS, could be processed through abbreviated rulemaking. The following procedure is modeled after existing procedures in other FMPs and complies with the Administrative Procedures Act (APA).

Spring action	Fall action	Procedure description
March 1 - March 7 (7 days)	October 1 - October 7 (7 days)	(a) The Council will request proposals for areas that might be closed to protect small scallops or opened to catch large scallops, based on industry observations, survey results, or other sources of information. Proposals for changes in area management must be submitted by March 1 and October 1 of each year. These proposals will be evaluated by a Scallop Monitoring Committee to determine what areas are good candidates for additional surveys and possible closure. The committee will recommend to the Council within seven days of the above dates what areas should be surveyed and evaluated whether they meet the Amendment 10 criteria for closure or opening.
March 10 (3 days)	October 10 (3 days)	(b) The Chair of the Scallop Oversight Committee, upon receiving the Monitoring Committee report, shall determine if the situation warrants further investigation and possible Council action. In making this determination, the Committee Chair shall consider the criteria for closure a scallop harvest area in accordance with the procedures therefore in Amendment 10 to the Atlantic Sea Scallop FMP. If he/she and the Council determine it is necessary, the Council will request the Regional Administrator to conduct supplementary industry or research surveys to accurately determine the amount and size of scallops in areas where further investigation and data collection is warranted. If sufficient funds and vessels are available, the supplemental surveys will be conducted within two weeks of the Council making the request. If supplemental surveys cannot be conducted, the Regional Administrator will summarize the applicable data from the annual research survey that bears on a decision on whether to close areas identified in paragraph (a).

Spring action	Fall action	Procedure description
March 21 (14 days)	October 21 (14 days)	(c) After the surveys had been conducted and the data have been processed, the Regional Administrator will forward the information to the Scallop PDT to determine the condition of the scallop resource to determine the presence of large concentrations of small or spawning scallops, within the deadlines specified in Amendment 10 and provide the technical analysis required by Amendment 10.
April 4 (14 days)	November 4 (14 days)	(d) The NEFMC shall prepare an analysis of the economic impacts of the potential management options under consideration within the deadlines specified in Amendment 10.
April 18 (14 days)	November 18 (14 days)	(e) Copies of the analysis and reports prepared by the (To Be Determined - Regional Administrator, Scallop PDT, or Scallop Monitoring Group) and the NEFMC shall be made available for public review at the NEFMC's office and the Council shall hold a meeting/public hearing, at which time it shall review the analysis and reports and request public comments. Upon review of all available sources of information, the Council shall determine what course of action is warranted by the facts and make a recommendation, consistent with the provisions of Amendment 10 to the Regional Administrator. The Council may delegate the decision for closures to the Scallop Oversight Committee.
April 26 (8 days)	November 26 (8 days)	(f) By the deadline set in Amendment 10 the Regional Administrator shall either accept or reject the Committee's recommendation. If the recommended action is consistent with the record established by the monitoring committee and PDT reports, the impact analysis, and comments received at the public hearing, he/she shall accept the Committee's recommendation and implement it through notification in the Federal Register and by notice sent to all vessel owners holding Scallop permits. The Regional Administrator shall also use other appropriate media, including, but not limited to, notification by Vessel Monitoring System messages, mailings to the news media, fishing industry associations and radio broadcasts, to disseminate information on the action to be implemented.
May 1 (5 days)	December 1 (5 days)	(g) Actions taken under this section will ordinarily become effective upon the date of filing with the Office of the Federal Register. The Regional Administrator may determine that facts warrant a delayed effective date.
Annual adjustment via framework		(h) Once implemented, the Regional Administrator shall monitor the scallop harvest area, in accordance with the procedures in Amendment 10, to determine if the closure is still warranted. If the Regional Administrator determines that the circumstances under which the closure was taken, based on the monitoring committee and PDT report, the NEFMC's report, and the public comments, are no longer in existence, he/she shall terminate the closure and open the scallop harvest area by framework adjustment in accordance with the provisions of §48.55.

Rationale : A mechanism to quickly close areas where small scallops occur is needed to make an area rotation/management system have the desired effects. The following table summarizes a system that could allow area closures to take effect in as little as 2-3 months after detection by survey or reports by fishermen.

A specific, formal procedure (see above table) would enable relatively rapid action to close areas when small scallops are locally abundant. This procedure would be followed to collect detailed information to determine the range of the strong recruitment, to gather information through public input and comment, and to implement the closures via a Notice Action. Based on PDT analysis, it appears that areas could be closed in as little as two months if the FAAS action-like procedure is followed. The PDT recommended that this planned procedure should be initiated on March 1 and October 1 to effect closures on May 1 or December 1, respectively. An environmental assessment (EA), but not an environmental impact statement (DSEIS), would normally be associated with this action.

5.3.9.2 Annual specifications during non-framework years

Standard rule-making processes would be followed to effect changes only in allocations of days-at-sea and TAC setting, and/or zero allocations for new or existing closures. Other management changes would be reserved for the bi-annual framework adjustment process, an existing ad hoc framework adjustment process, or a plan amendment, depending on the nature of the proposed regulatory amendments. An environmental assessment (EA), but not an environmental impact statement (DSEIS), would normally be associated with this action.

Rationale : An substitute process is needed to make routine management adjustments (i.e. day-at-sea and TAC specifications) to make a two-year framework adjustment cycle viable.

5.3.9.3 Two-year cycle framework adjustment process

The present framework adjustment process and monitoring report development would occur every two years, instead of one. This process would remain essentially the same as the present procedure, except that allocations and closures would be specified annually through the annual specification process (Section 5.3.9.2) when a framework adjustment was not considered. A comprehensive SAFE Report and scheduled framework adjustments would occur every two years, rather than every year as now conducted.

New frameworkable measures, supporting area rotation would be added, including:

- Size and configuration of rotation management areas
- Option to apply constraints to units within blocks (e.g. areas of boulder bottom), rather than whole blocks.
- Re-opening seasons.
- Area-specific day-at-sea or trip allocations
- Amount and duration of TAC specifications following re-opening.
- Limits on number of closures.
- TAC or day-at-sea set asides for funding research, for funding research, and for scallop fishing by vessels not on a scallop day-at-sea.
- Priorities for scallop-related research that is funded by a set aside from scallop management allocations.

Rationale : This change would allow the Council and NMFS time to administer a more complicated area rotation management system, as well as time to develop future plan amendments when necessary. An environmental assessment (EA) would normally be associated with this action, but a DSEIS may be prepared with an expansion in the normal framework adjustment process time line to accommodate the more in-depth analysis.

The longer framework adjustment cycle could reduce administrative costs arising from frequent extensive analysis, review, and approval currently associated with framework adjustments. The longer cycle would be adequate to manage the scallop resource and fishery, especially with minor interim annual specifications and/or area action notices to respond to variations in the fishery and the resource.

5.3.9.4 Scallop fishing year

The scallop fishing year would change from March 1 to a date between July 1 to September 1, inclusive. Day-at-sea allocations and area re-openings would occur beginning on July 1 to September 1. New management regulations that are proposed and implemented would also likely begin between these dates. See Table 31 for comparison with the status quo.

The SAFE Report would be developed beginning in October or November after the results of the annual resource survey are available. The first framework meeting would be in March, followed by a final framework meeting would be in April or May. A two-month review of the framework adjustment process in June and July would occur for implementation on August 1. If the survey results are routinely available earlier than this, the entire process could be moved up a month or two.

A longer “bridge” year would allow for transition by allocating 16 to 18 twelfths of the normal day-at-sea allocation for full-time, part-time and occasional limited access permits. If for example the fishing year is moved to August 1, a full-time vessel would receive 170 days to fish between March 1, 2003 and July 31, 2004 (17 months, assuming a 120 day-at-sea annual allocation).

Rationale : This alternative would streamline annual adjustments to take into account the most recent Albatross survey data and align the fishing year with the timing of the resource survey. It would reduce the amount of duplicative analyses that are currently required when the annual survey data becomes available in the middle of the annual adjustment review process.

Fishing year options for Amendment 10

Status quo: March 1 to February 28/29

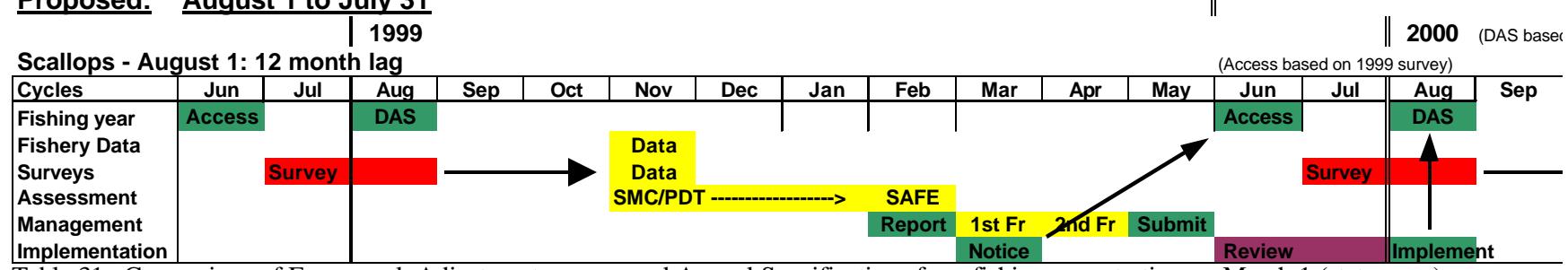
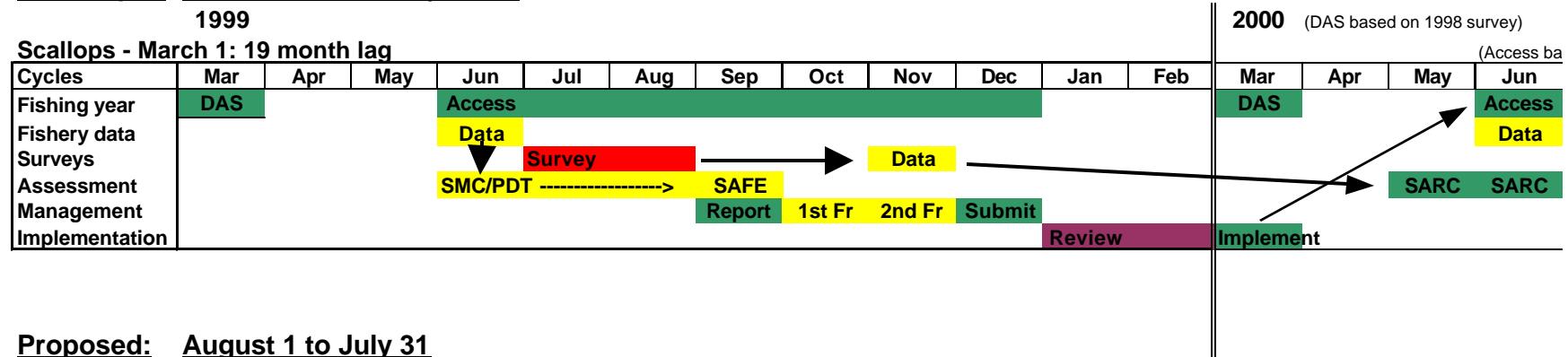


Table 31. Comparison of Framework Adjustment process and Annual Specifications for a fishing year starting on March 1 (status quo) versus August 1 (proposed)

5.3.9.5 Increase the carry over day limit (range: 10-30 days)

The present 10 day carry over for vessels that have 10 or more days-at-sea unused at the end of the fishing year would increase to an amount between 10 and 30 days. Vessels would be eligible to use carry over days for only the following fishing year.

Rationale : This measure is intended to reduce the business risk associated with changing the fishing year to start in mid-summer, if vessels are caught in a situation of not being able to use all of their annual allocations due to weather, equipment failure, or other circumstances.

5.3.9.6 Adjustments for Broken Trips

If the management limits in re-opened rotation management areas rely on trip allocations and day-at-sea tradeoffs (Section 5.3.3), fishing in re-opened rotation management areas involves a risk that may not be adequately balanced by a generous scallop possession limit for the day-at-sea charge. If management limits in re-opened management areas rely on area-specific day-at-sea allocations, however, the procedure in this section would be unnecessary.

This risk of course, varies between vessels and some do not feel that the automatic day-at-sea charge is worth it. The risk from incomplete trips that land much less than the possession limit include equipment failures, medical emergencies, extremely bad weather, or other causes. The mechanism described below would reduce the risk from incomplete trips and encourage more vessels to fish their authorized trips.

If a trip is terminated early and the captain meets the requirements identified in this section below, the vessel will be charged two days-at-sea plus a day-at-sea for each 10 percent of the scallop possession limit (e.g. 1,500 pounds of the hailed scallop landings if the scallop possession limit is 15,000 pounds) or portions thereof. If the day-at-sea tradeoff in re-opened rotation management areas is a value other than 10 days, the vessel would be charged two days-at-sea plus 10 percent of the re-opened area automatic day-at-sea charge for each 10 percent of the scallop possession limit (see Table 32).

Actual time will be charged against a vessel's annual day-at-sea allocation for trips that are longer than these amounts, unless a special exemption is granted by the Regional Administrator. The schedule for the day-at-sea charge for early terminations is given in the table below.

Vessels may terminate a trip early for an emergency, poor weather, or any other reason deemed appropriate by the captain and have fewer than 10 days-at-sea charged against the vessel's annual allocation. To terminate a trip and have a reduced day-at-sea charge of a Hudson Canyon or VA/NC Area trip, the Captain must notify NMFS of his intent to terminate the trip before landing; and report the reason for the termination, the hail weight of the scallop catch onboard the vessel, and the intended time and location of offloading and landing.

Table 32. Schedule of day-at-sea charges for trips terminated early by limited access scallop vessels for trips in the Hudson Canyon and VA/NC Areas. This is an example day-at-sea charge schedule if the scallop possession limit is 15,000 or 24,000 pounds and the re-opened area day-at-sea tradeoff is 10 or 14 days.

Proportion of scallop landings to the scallop possession limit	<i>Example haul weight of sea scallops (meat weight, pounds)</i>		<i>Minimum day-at-sea charge</i> ³⁷	
	15,000 pound possession limit	24,000 pound possession limit	10 day-at-sea tradeoff	14 day-at-sea tradeoff
0 percent	Zero	Zero	2 days-at-sea	2 days-at-sea
More than 0 to 10 percent	1 to 1,500	1 to 2,400	3 days-at-sea	3.4 days-at-sea
More than 10 percent to 20 percent	1,501 to 3,000	1,501 to 4,800	4 days-at-sea	4.8 days-at-sea
More than 20 percent to 30 percent	3,001 to 4,500	3,001 to 7,200	5 days-at-sea	6.2 days-at-sea
More than 30 percent to 40 percent	4,501 to 6,000	4,501 to 9,600	6 days-at-sea	7.6 days-at-sea
More than 40 percent to 50 percent	6,001 to 7,500	6,001 to 12,000	7 days-at-sea	9.0 days-at-sea
More than 50 percent to 60 percent	7,501 to 9,000	7,501 to 14,400	8 days-at-sea	10.4 days-at-sea
More than 60 percent to 70 percent	9,001 to 10,500	9,001 to 16,800	9 days-at-sea	11.8 days-at-sea
More than 70 percent	Over 10,500	Over 19,200	10 days-at-sea	13.2 days-at-sea

Rationale: An adjustment to the day-at-sea tradeoff (Section 5.3.3.2) for broken trips is needed to reduce the business risk of fishing in re-opened rotation management areas. This risk, e.g. losing 10 days-at-sea from a vessel's annual allocation without landing a significant fraction of the possession limit, inhibits fishermen from participating in the program. Since the day-at-sea tradeoff reduces fishing effort and mortality in the remaining open areas, it is beneficial to the resource to reduce this risk and encourage scallop fishing where intended according to area rotation management policies. Encouraging more participation by scallop vessels decreases the need and/or size of an in-season adjustment to re-allocate unused trips, which would discourage fishing effort from being concentrated in the less desirable fall season and ensure that the fishery achieves optimum yield. A third effect would be to improve safety. In some cases, fishermen would be less inclined to keep fishing in the face of bad weather if they knew that they wouldn't lose the full 10 day-at-sea charge if they came home early. At present, fishermen are unsure of whether they would be granted an adjustment and could be less prudent in bad weather because of this risk of not landing sufficient scallops to make a 10 day-at-sea charge a profitable swap.

In Framework Adjustment 14, the day-at-sea adjustment for broken trips became a non-preferred alternative because of law enforcement concerns. Although vessels would be required to hail the catch and report the intended time of landing, law enforcement interests thought that this program could create opportunities for abuse. A second factor in the decision was that NMFS believes that an existing program performed satisfactorily and reduced the risk vessels face when fishing in the Hudson Canyon and VA/NC Areas. Under the existing program, vessels can apply for an adjustment to the day-at-sea charge

³⁷ Actual time at sea will be charged against the vessel's annual day-at-sea allocation for trips longer than these amounts, unless a special exemption is granted by the Regional Administrator.

for broken trips. NMFS has granted or denied adjustments on a case-by-case basis for vessels that claim a medical emergency, equipment failure, bad weather, or other legitimate reason to return early to port.

This provision furthermore establishes no guidelines for determining emergency situations or granting day-at-sea adjustments and leaves the provision open for abuse. Due to the opportunity and potential for this abuse, NMFS and the Office of Law Enforcement could not ensure the integrity of the day-at-sea adjustment program. Under the present system, vessels that mistakenly selected a closed area access trip, or that believe that a portion of the day-at-sea charge should be credited for a particular trip, should request a credit based on evidence that the charge was made in error. NMFS reviews each case individually and a determination is made based on a policy enacted by the Regional Administrator. Several vessels have successfully been able to take advantage of this policy due to weather conditions, gear problems and breakdowns that cut trips short or prevented the vessel from entering a closed area despite that they had indicated that they were beginning a closed area access trip.

On the other hand, the amount of fishing activity in the Hudson Canyon and VA/NC Areas in 2001 was significantly below desired amounts and only about ½ of the TAC was landed. Few trips in the Hudson Canyon Area have so far been taken in 2002 also. Part of the reason for the sub-optimal amount of fishing effort (and corresponding mortality reduction in other scallop fishing areas) is because catch rates outside of the Hudson Canyon and VA/NC Areas was around 1,800 pounds per day, reducing the attractiveness of fishing in the Hudson Canyon and VA/NC Areas with an 18,000 pound possession limit and a 10 day-at-sea tradeoff.

Without the risking an automatic 10 day charge for a Hudson Canyon and VA/NC Area trip, it may have been attractive to fish there for the larger, more valuable scallops. For many vessels, the added costs associated with fishing in the Hudson Canyon and VA/NC Areas wasn't worth the marginal increase in revenue from landing larger scallops. Market changes also reduced the premium between the size of scallops in the Hudson Canyon Area and the scallops available elsewhere. In any case, reducing the administrative cost of potential incomplete trips will allow area rotation to work more effectively.

5.3.9.7 Status quo

Monitoring (SAFE) reports and standard framework adjustments would be initiated on an annual basis. A first framework meeting and a second framework meeting would be conducted around September and November, respectively, allowing for implementation of fishing year measures on March 1. The scallop fishing year would remain unchanged. Day-at-sea allocations and new management measures that are approved by framework adjustment would take effect on March 1. The status quo would also retain the current 10 day maximum day-at-sea carry forward provision and the broken trip adjustment process would continue to operate under the discretionary authority of the Regional Administrator.

Unless the survey were moved up a few months, the SAFE Report would contain resource condition information from the previous, rather than current, year. The analysis of management alternatives in the framework adjustment would require an update of the SAFE Report information

Rationale : The review and analysis begins in early July and survey data become available in late August to early October. Depending on the timing of the first framework and associated meetings, the annual survey data may or may not be available during for the first framework meeting.