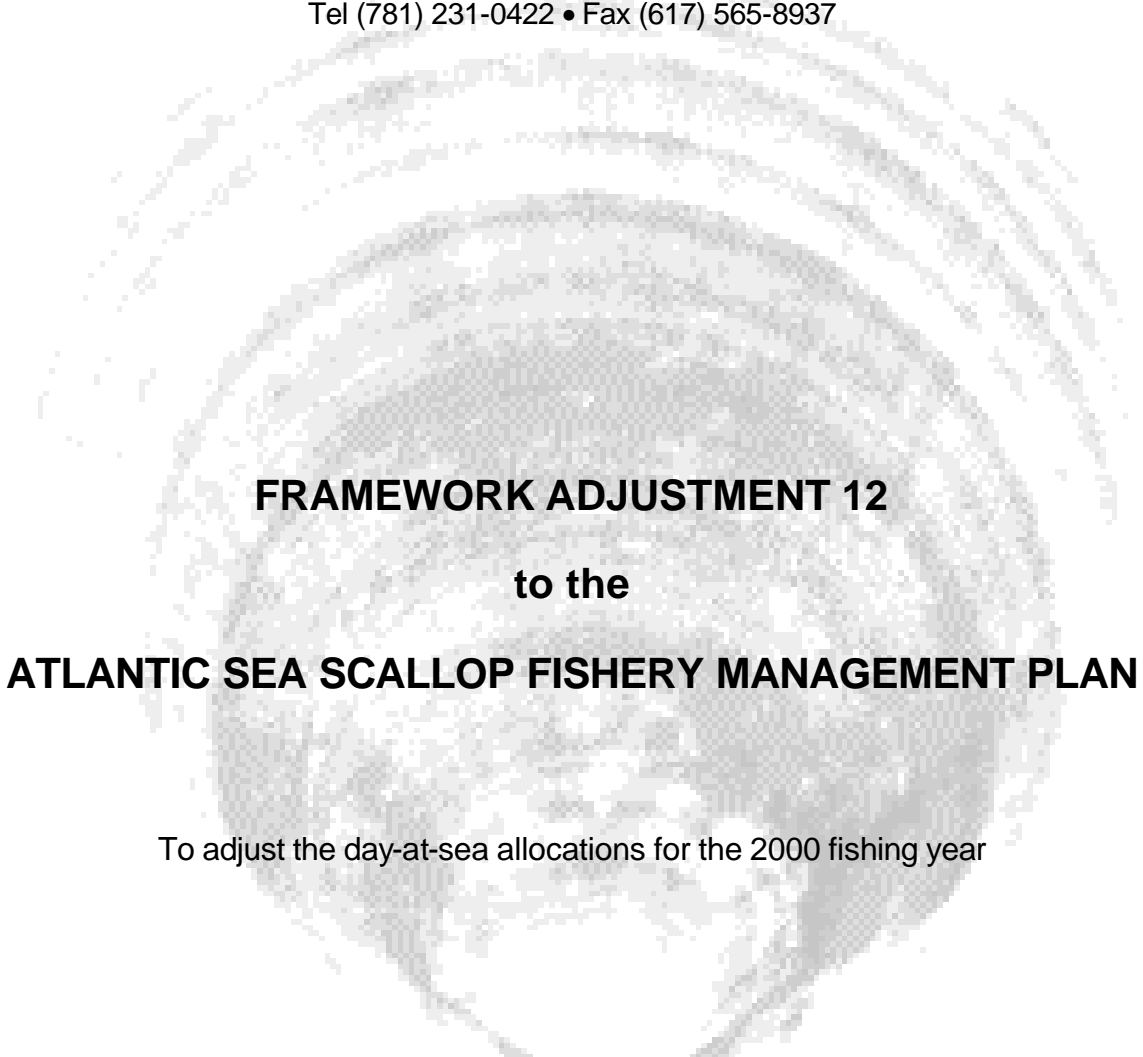


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FRAMEWORK ADJUSTMENT 12

to the

ATLANTIC SEA SCALLOP FISHERY MANAGEMENT PLAN

To adjust the day-at-sea allocations for the 2000 fishing year

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

Initial framework meeting: September 22, 1999

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2.0 INTRODUCTION and BACKGROUND

Framework Adjustment 12 proposes to adjust the annual day-at-sea allocation for the fishing year, beginning on March 1, 2000. No other action is proposed by this framework, but other in-season adjustments may be considered in a future framework adjustment, particularly to allow access to some closed areas. If approved, the proposed action (Section 5.1) would increase the annual day-at-sea allocation for vessels with limited access scallop permits. Full-time vessels would be allocated 120 days. Part-time vessels would be allocated 48 days and occasional vessels would be allocated 10 days. Under the status quo, these vessels would receive 51, 20, and 4 days-at-sea respectively. In addition to these allocations, vessels may carry forward up to 10 unused days from the prior fishing year according to existing regulations.

This action is being proposed via the annual framework adjustment process, authorized by §648.55 of the regulations for the Atlantic sea scallop fishery. It follows Amendment 7, a major plan amendment to implement a new overfishing definition, comply with the Sustainable Fisheries Act (SFA) mandates, and start the process to rebuild stock biomass to maximum sustainable yield (MSY) conditions. The fishing year beginning on March 1, 2000 represents year 2 of the 10-year rebuilding schedule and this is the first framework adjustment following implementation of Amendment 7.

2.1 Amendment 7

Amendment 7 was the last major change for the management of the Atlantic sea scallop fishery and the proposed action in this framework would make an annual adjustment to the Amendment 7 specifications for the fishing year, beginning on March 1, 2000. Amendment 7 was needed to comply with the Sustainable Fisheries Act, which Congress passed in October 1996. In this amendment, the Council implemented a new overfishing definition and fishing mortality control rule, initiated a ten-year rebuilding program, changed and extended the Amendment 4 day-at-sea schedule and fishing mortality targets, and revised the framework adjustment process.

In Amendment 7, the Council changed the annual fishing mortality targets to stop overfishing according to the new definition and achieve rebuilding in 10 years or less. The first year of Amendment 7 (1999) continued the final year of the Amendment 4 mortality schedule to allow for industry adjustment and for development of new management strategies. This initial target would be followed by a series of reductions through the 2002 fishing year to stop overfishing and additional reductions in 2003 – 2007 to boost stock rebuilding. Amendment 7 would allow the target fishing mortality to rise to the overfishing definition target (80 percent of FMSY) by 2008 or earlier if management achieved the biomass target. The annual fishing mortality targets are shown in Table 1 for Amendment 4 (which initiated limited access and the day-at-sea regulations) and for Amendment 7:

Table 1. Fishing mortality schedules in the Atlantic Sea Scallop FMP.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amendment 4	0.76	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Amendment 7	0.83	0.34	0.28	0.24	0.22	0.15	0.15	0.15	0.15	0.20

During the development of Amendment 7, the day-at-sea allocations and the scallop limited access program were considered to be the primary management controls to achieve the fishing mortality targets. The conservation of scallops in the closed areas was not yet estimated in the existing assessments, although the growth of scallop biomass was however identified. Although Amendment 4 assumed a one-to-one relationship between days-at-sea allocated and fishing mortality, the analysis for Amendment 7 estimated the relationship between total days used and fishing mortality, with a zero intercept¹. From this relationship, Amendment 7 projected that the number of days shown in Table 2 could be allocated to achieve the annual fishing mortality targets:

Table 2. Total day-at-sea allocations for achieving the fishing mortality targets in Amendment 7.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Amendment 7	26,936	11,389	10,939	10,217	10,079	7,663	7,897	8,534	9,575	13,411

Based on day-at-sea use and scallop vessel activity during the 1997 fishing year, Amendment 7 estimated that the following annual allocations per vessel were possible.

Table 3. Projected annual day-at-sea allocations for limited access scallop vessels according to Amendment 7.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Full-time	120	51	49	46	45	34	35	38	36	60
Part-time	48	20	19	18	18	14	14	15	17	24
Occasional	10	4	4	4	4	3	3	3	4	5

Amendment 7 recognized that changes in vessel activity, fishing technology, area management, and resource conditions would require adjustments to the above day-at-sea allocations. In addition to the management measures discussed above, Amendment 7 also included:

- A revised specification of optimum yield
- Continuation of the Mid-Atlantic closed areas with a sunset date of March 1, 2001 unless opened earlier as part of an area management program
- A system for closing and opening areas to improve yield-per-recruit
- Additional framework measures:
 - ❖ Modifications to the overfishing definition
 - ❖ Leasing of days-at-sea (with a full set of public hearings)
 - ❖ Scallop size limits, not including a minimum individual meat size
 - ❖ Approval of aquaculture projects in the EEZ
 - ❖ Modifications to the Mid-Atlantic closed areas
 - ❖ Demarcation lines for monitoring and counting day-at-sea use
 - ❖ A provision to allocate different day-at-sea amounts by gear sector
 - ❖ Closing areas to increase day-at-sea allocations or improve yield-per-recruit

As explained above, Amendment 7 did not change the final year of Amendment 4 day-at-sea schedule to:

1. Allow the scallop industry an additional year to develop a buyback program before further, more severe cuts in days-at-sea would be implemented in 2000
2. Allow the Council more time to develop an area management approach to take advantage of the rapid growth of scallops

¹ A zero intercept assumes that fishing mortality would be zero when there is an allocation of zero days-at-sea.

3. Allow the Council to get information from the experimental fishery in groundfish closed areas to supplement the available biological information and to develop a policy with respect to scallop fishing in these areas

Some progress has been made on these goals, but the proposed action is not based on progress to date. Rather the proposed action is based on a re-assessment of the resource and the considerable conservation caused by the protection of abundant scallop concentrations inside the closed areas. At the present time, the final rules for an industry buyback program have not been published, so there has been little progress toward developing one for the scallop fishery. The considerable pressure to access the closed areas in 1999 and the resources needed for the annual adjustment have delayed work on Amendment 10, which would address item 2 above.

Lastly, data and analysis about scallop growth and mortality in the closed areas has been slow to develop. The 1998 experimental fishery only included Closed Area II, while the 1999 experimental fishery included Closed Area I and the Nantucket Lightship Area, but not Closed Area II. The 1999 information is being used to consider allowing access via Framework Adjustment 13. An experimental fishery in the Mid-Atlantic closed areas is planned for late 1999 and early 2000. This latter information will become important when the Council considers re-opening the Mid-Atlantic areas to scallop fishing in 2001.

The interim policy with respect to scallop fishing in these areas has been to set the TAC at maximum sustainable levels and allow access through conservation-neutral programs. This includes day-at-sea tradeoffs to reduce total time fish and reduce effort in open areas to compensate for the higher catch rates in the closed areas. A more permanent management policy, possibly including specific bio-economic criteria for closing and re-opening areas, is contemplated for Amendment 10, which the Council plans to implement in 2001.

Although progress on these issues that Amendment 7 contemplated has been slow, it is necessary to adjust the 2000 fishing year specifications based on more recent data and assessments. The proposed action will bridge the gap between Amendment 7 and Amendment 10, while achieving the fishing mortality and rebuilding objectives of Amendment 7.

2.2 Benchmark Assessment – July 1998

The 29th Stock Assessment Workshop (NMFS 1999a) completed a benchmark assessment of Georges Bank and Mid-Atlantic sea scallops in August 1999. This assessment estimated fishing mortality and stock biomass from 1982 to July 1998. During the last assessment year, the day-at-sea allocations (the primary management measure in the FMP) were 142 days, 57 days, and 12 days for vessels with full-time, part-time, and occasional limited access scallop permits, respectively. This was also the first full assessment year when the requirement for 3½-inch rings were in effect².

Unlike previous assessments, the DeLury two-cohort model was not used to estimate mortality and stock biomass. A similar, but more complex model (although still basically a two-stage model) was attempted, but was rejected by the Stock Assessment Review Committee (SARC). The new two-stage model had poor diagnostics and gave implausible parameter estimates. In lieu of an analytic assessment, the SARC relied on a comparison of catch and swept-area biomass, scaled so the estimated fishing mortality rate had the same average as a catch curve analysis from survey data alone. This method,

² The regulation for minimum ring diameter changed from 3¼-inches to 3½-inches in March 1997.

modified to better match the fishing year, is described more completely in Section 4.1.2 of the 1999 SAFE report (NEFMC 1999b).

The SAW 29 report described the state of the stock as follows:

“The U.S. Georges Bank stock is not overfished but its biomass is below the B_{MSY} target level. The Mid-Atlantic stock is at or near the $\frac{1}{4} B_{MSY}$ biomass threshold used to determine if the stock is overfished. Although both stocks are still below B_{MSY} , their condition has improved. The improvement is primarily due to growth of scallops in areas that were closed to fishing to protect groundfish, rather than increased recruitment. Increases in stock biomass were larger in the Georges Bank region; the area where closures were implemented earlier (i.e. 1994). Recruitment of scallops fluctuated around average values during 1995-1998 while stock biomass increased to the highest levels seen since 1991.

The U.S. Georges Bank stock is being exploited at or near the F_{MSY} overfishing threshold. Fishing mortality exceeds F_{MSY} and overfishing is occurring for the Mid-Atlantic stock.”

In summary, biomass for both stocks has increased between 1996 and 1998, but the majority of scallop biomass is in the five closed areas (Table 4). Biomass for Georges Bank has increased to 51 percent of the target, above the minimum 25 percent threshold used to define an overfished condition. Biomass in the Mid-Atlantic has increased only to 31 percent of the target, slightly above the minimum biomass threshold and is overfished (NMFS 1999b).

According to the assessment, fishing mortality in both stock areas has declined. Fishing mortality for the Georges Bank stock was greater than 1.0 in 1993 and has declined to only 0.09 (Table 5). Similarly, fishing mortality for the Mid-Atlantic stock was 0.81 in 1996 and declined to 0.30 in 1998. Since most of the biomass is in closed areas, however, fishing mortality in the open areas is very high, well over the overfishing definition threshold ($F = 0.14$ to 0.21).

Table 4. Mean stratified and swept area scallop biomass estimates derived from NMFS annual scallop survey data.

<i>Survey biomass (kg/tow)</i>									
<i>Survey year</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
Georges Bank – All areas	1.31	1.35	1.67	0.52	0.46	0.78	1.45	1.68	4.15
Mid-Atlantic – All areas	1.72	0.98	0.56	0.76	1.05	1.61	0.79	0.55	1.27
Georges Bank – Closed areas	1.95	1.82	1.31	0.64	0.56	0.78	2.19	2.84	7.90
Mid-Atlantic – Closed areas	4.44	1.22	0.58	0.96	1.75	3.62	1.74	0.85	3.07
<i>Swept area biomass (mt)</i>									
<i>Survey year</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
Georges Bank – All areas	6,387	6,572	8,133	2,522	2,247	3,799	7,087	8,184	20,219
Mid-Atlantic – All areas	9,494	5,385	3,069	4,191	5,806	8,902	4,333	3,058	6,561

Table 5. Fishing mortality for Atlantic Sea Scallops (from NEFSC 1999).

<i>Survey year</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
<i>Georges Bank</i>	1.31	1.19	0.85	1.22	0.43	0.22	0.24	0.24	0.09
<i>Mid-Atlantic</i>	0.48	0.92	1.14	0.47	0.71	0.50	0.81	0.67	0.30

2.3 Annual Monitoring (SAFE)

2.3.1 Effectiveness of management in 1999

A Stock Assessment and Fishery Evaluation (SAFE) report was prepared in anticipation of potential management adjustments for the fishing year beginning on March 1, 2000. In the report, fishery and stock data was analyzed and summarized (Section 3.0) for the 1998 fishing year, the last one for which complete data are available on permits, day-at-sea activity, research surveys, and economics.

This information was updated, where possible, with preliminary and partial data for the 1999 fishing year (Section 4.0). To the extent possible, the recent benchmark assessment (Section 2.2) assessment was updated with more recent information and fishing mortality in 1999 was predicted from a regression on day-at-sea use and protection of scallop biomass in closed areas. A regression analysis in the SAFE report indicated that the 2000 fishing year mortality target ($F=0.34$) would be met by continuing the 1999 allocation of days-at-sea, provided that there is no significant activation of Confirmation of Permit Histories and inactive scallop permits, or that managers avoided allowing unrestricted access to the relatively high biomass in closed areas.

The SAFE report included new biological and economic projections (revised for Framework Adjustment 12; Section 6.2.6.2) with a new biological model that forecasts biomass and yield separately for each of the five closed areas, plus the open portions of the Georges Bank and Mid-Atlantic stock areas. The projections indicate that scallop rebuilding is ahead of the schedule anticipated by the Amendment 7 analyses. The accelerated rebuilding has occurred primarily because of an apparently strong year class in 1998 and because of accumulated biomass in the closed areas. Overall, the Amendment 7 mortality schedule was forecast to achieve the rebuilding targets by 2005 (7th year of the Amendment 7 rebuilding program) on Georges Bank and by 2004 (6th year of the Amendment 7 rebuilding program) in the Mid-Atlantic.

In addition to this projection, a supplementary analysis of landings and catch per day-at-sea was conducted to estimate the effects of status quo management during the 2000 fishing year. The status quo analysis assumed that the day-at-sea program would remain unchanged and full-time limited access vessels would receive 51 days to fish for scallops during the 2000 fishing year. In this analysis, the status quo also meant that all limited access vessels would make three trips into Closed Area II to fish, landing up to 10,000 pounds of scallops and accumulating 10 days-at-sea for the trip. No other closed areas were assumed to be re-opened under the status quo management scenario. In this case, the expected landings were considerably lower than the other projections and based on the F-DAS relationship (NEFMC 1999b: Section 4.1.3), the fishing mortality rate for the stocks would be much less than the Amendment 7 target. This alternative projection was used to compare the relative economic benefits of changing the day-at-sea allocations to 1999 levels, rather than making no management changes to the Amendment 7 schedule.

2.3.2 SAFE Conclusions and Management Recommendations

The PDT recommended in the SAFE report (NEFMC 1999b) the seven management adjustments shown below for the 2000 fishing year,. No recommendations were made in this report for subsequent years, because Amendment 10 will potentially change the management policy regarding days-at-sea and access to closed areas. Unless a subsequent framework adjustment or Amendment 10 replaces the day-at-sea schedule after the 2000 fishing year, days would otherwise continue to follow the Amendment 7 schedule. This implies that the day-at-sea allocation for full-time vessels in 2001 would drop to 49 days to achieve an annual fishing mortality target equal to 0.28.

- 1) *“Day-at-sea allocations should be increased to 1999 levels: 120 days for full-time vessels, 48 days for part-time vessels, and 10 days for occasional vessels. Under current regulations, vessels in these permit categories would receive 51, 20, and 4 days, respectively.*
- 2) *Access to Closed Area II should continue, but the TAC should be adjusted to be consistent with the exploitable biomass in Closed Area II to achieve the F_{ma} objective for the exploitable portion of the resource. If the current TAC policy continues, management would sacrifice yield by overfishing the exploitable portion of the scallops in Closed Area II, possibly forcing a discontinuation of access for a considerable recovery period. Otherwise, the management program for Closed Area II appears to be working well and the Council should consider continuation of the program in its current form.*
- 3) *The Council should consider allowing scallop fishing in less sensitive areas of the HAPC, since part of this area is very productive for scallops and has been a traditional fishing area, contributing significant landings. Coarse examination of the bottom classification on eastern Georges Bank, compared to the scallop distribution from the experimental survey in 1998 indicates that the area north of 42°08' N latitude could be acceptable, especially if the gravel pavement areas to the west of Closed Area II are closed for as much as a year to mitigate the disturbance in the HAPC.*
- 4) *Access to Closed Area I and the Nantucket Lightship Area is desirable from the perspective of the scallop resource and net benefits to the scallop fishery. There are however many issues that remain in these two areas, including the effects on bycatch species and habitat. While Georges Bank yellowtail flounder are nearing a rebuilt condition (NEFSC 1999c), Southern New England yellowtail flounder biomass is far below the minimum threshold. Other species could also be of concern, including a more resident population of cod and haddock in Closed Area I. The experimental fisheries that are now underway should answer some of these questions if the information is available in time for the final framework document.*
- 5) *The PDT did not recommend allowing access to the Mid-Atlantic closed areas at this time. Based on the size distribution of scallops in 1998, it appears that re-opening those areas to fishing in 2001 would provide greater benefits. It would also allow sufficient time to collect the information necessary to ensure that the management action would be conservation neutral and not increase fishing mortality.*
- 6) *It may be impossible to avoid catches that exceed the low groundfish possession limits set for scallop fishing outside of the Georges Bank area closures. Instead of allowing access to areas with higher bycatch and promoting discarding, the PDT recommends that the Council develop and evaluate programs to allow the landings of unavoidable bycatch. Some of the revenue that would be generated could be used to fund conservation programs, similar to the one-percent TAC set aside for the Closed Area II scallop fishery.*

- 7) *The PDT recommends against implementing a supplementary limited access program for boats with latent permits at this time. The original allocation of scallop days-at-sea plus the relatively high cost of re-entry into the fishery with a Confirmation of Permit History reduces the potential for large increases of fishing activity with latent or unused days. Under conditions anticipated for the short term, the danger is low that reactivation of latent effort would cause higher fishing mortality and dissipate benefits to active vessels. On the other hand, the Council should be aware of this potential when it considers allowing access to areas that have been closed to scalloping and have rebuilt.”*

2.4 Meetings and Opportunity for Public Comment

Prior to and during the development of Framework Adjustment 12, the Council held the following meetings. The meetings where access to the groundfish closed areas was a primary and specific agenda item are listed for completeness. Following the formal framework initiation by the Council in January, numerous Council committee, plan development team (PDT), advisory, and scientific meetings were held to discuss issues and concerns, to develop recommendations, and to specify management alternatives. These meetings are summarized in the following table.

Prior to initiation of the framework adjustment – SAFE report and assessment meetings	
Date	Meeting
October 17, 1997	Scallop and Groundfish Plan Development Teams
May 20, 1999	Invertebrate Assessment Sub-committee
June 2, 1999	Scallop Plan Development Team
June 21-25, 1999	Stock Assessment Review Committee
July 7-8, 1999	Scallop Plan Development Team
July 29-30, 1999	Scallop Plan Development Team
August 24, 1999	Scallop Plan Development Team
September 16-17, 1999	Scientific and Statistical Committee
Framework adjustment meetings	
Date	Meeting
September 9, 1999	Scallop Advisory Committee
September 10, 1999	Scallop Oversight Committee
September 22, 1999	Initial Framework (Council) Meeting – Fairhaven, MA
September 28-29, 1999	Scallop Oversight Committee
October 6-7, 1999	Scallop Plan Development Team
October 6, 1999	Habitat Technical Team
October 18, 1999	Scallop Plan Development Team
October 19, 1999	Habitat Oversight Committee
November 8, 1999	Research Steering Committee
November 10, 1999	Groundfish Oversight Committee
November 12, 1999	Scallop Oversight Committee
November 15, 1999	Gear Conflict Committee
November 15, 1999	Enforcement Committee
November 17, 1999	Final Framework (Council) Meeting – Gloucester, MA

Consistent with the Council’s framework adjustment procedures in the Atlantic Sea Scallop and the Northeast Multispecies FMPs, two formal framework meetings were also held. Both were held at a regularly scheduled Council meeting, the initial meeting on September 22, 1999 in Fairhaven, MA and

the final meeting on November 17, 1999 in Gloucester, MA. Notices and agendas for both meetings, as well as all committee meetings, were published in the Federal Register and distributed to the Council's extensive interested party mailing list.

2.5 Industry proposals

During the annual monitoring process, the Council received two proposals for management adjustments in the 2000 fishing year. Both are included in the 1999 Scallop SAFE report (NEFMC 1999b) and are not therefore duplicated in this document. One proposal by the American Oceans Campaign primarily commented on access to closed areas and habitat issues in general. The proposal did not address the potential day-at-sea allocations.

The other proposal was from the Fisheries Survival Fund (FSF), represented by Brand, Lowell & Ryan of Washington, DC. This proposal commented on measures and made recommendations for both day-at-sea allocations and for interim access to closed areas. Their comments were that the measures in place during the development of Amendment 7 were already having the intended effect of rebuilding biomass and that the measures for 2000-01 should be a continuation of those in place during the 1998 fishing year. Specifically they asked the Council to consider an allocation equal to those in place during 1998, i.e. 142 days-at-sea for full-time scallop vessels. The FSF maintained that the updated assessment using the 1998 survey would show more progress toward rebuilding and greater conservation through closed areas than had been anticipated by Amendment 7.

The Council added this alternative to Framework Adjustment 12 to analyze its impact and likelihood of achieving the fishing mortality target for 2000. This is included in Section 5.2.1 and analyzed in Sections 6.2.6 and 6.2.6.4. Upon further analysis, the Scallop PDT recommended a day-at-sea allocation at 1999 levels (i.e. 120 days-at-sea for full-time vessels) because of the close to 50 percent chance that a 142 day-at-sea allocation would exceed the fishing mortality target. Moreover, increasing the day-at-sea allocations from the 1999 levels would reduce the yield in 2001, possibly requiring greater reductions in day-at-sea allocations in 2001 to meet a lower mortality target, and making it more difficult to achieve a conservation-neutral strategy for closed area access.

For these reasons, the Council rejected this proposal at the present time. If conditions continue improving faster than anticipated, future annual adjustments could increase the day-at-sea allocations and still achieve the rebuilding goals of Amendment 7. On the other hand, below average recruitment or decreased effectiveness of closed areas could also cause the Council to reduce day-at-sea allocations to respond to future conditions. The Council intends on developing a more strategic approach to closed area management in Amendment 10, which could lessen the reliance on day-at-sea allocations to achieve the mortality and rebuilding objectives.

3.0 PURPOSE AND NEED

3.1 *Annual Day-at-sea Allocations*

The proposed action is intended to adjust the annual day-at-sea allocation for limited access scallop vessels in the 2000 fishing year. It would increase the allocation for full-time scallop vessels from 51 days-at-sea to 120 days-at-sea from March 1, 2000 to February 28, 2001. Similarly, the allocation for part-time scallop vessels would rise from 20 to 48 days and occasional scallop vessels from 4 to 10 days.

The adjustment is needed to make the primary control of fishing mortality consistent with current resource conditions and management policy. Based on an updated assessment, it now appears that increasing the Amendment 7 day-at-sea allocation will meet the 2000 fishing mortality target, as long as scallops in the closed areas remain protected or that access to the closed areas is conservation-neutral (i.e. does not increase total fishing mortality). Net benefits for the proposed action would increase by \$64.8 million, relative to status quo.

The Amendment 7 fishing mortality targets remain compatible with the FMP goals and Sustainable Fisheries Act (SFA) mandates (NEFMC 1999b). When the Council developed Amendment 7, survey data and stock assessment information were current through July 1997. The annual day-at-sea allocation in the prior year was 142 days and area closures were recent on Georges Bank and had not yet happened in the Mid-Atlantic. At that time, the large increase of scallop biomass in the Georges Bank closed areas was not yet significant and may have been underestimated by the 1997 survey.

Because of this best available scientific information, the relationship between the rebuilding stock in closed areas and total fishing mortality was not yet measurable. Amendment 7 relied therefore on large cuts in the day-at-sea allocations to achieve the fishing mortality targets needed to stop overfishing and rebuild the stocks, consistent with the SFA.

The 1999 SAFE report (NEFMC 1999b) updated this information, based on a more recent assessment (NEFMC 1999) and the 1998 survey, recognizing and estimating the relationship between conservation through closed areas and total fishing mortality (Section 6.2.6.1). It now appears that a higher day-at-sea allocation for the 2000 fishing year will meet the Amendment 7 target for 2000, provided that scallops in the closed areas remain protected or that access to the closed areas is conservation-neutral (i.e. does not increase total fishing mortality).

The status quo (51 days-at-sea for full-time scallop vessels) would achieve the fishing mortality targets in the open areas, but would cut total fishing mortality to a small fraction of the 2000 target for the resource. It would also be unnecessarily burdensome on the industry, fail to achieve optimum yield (OY), and cause most vessels to be unprofitable (Section 6.2.7.8). As recognized by Amendment 7, the large reduction in days-at-sea would have significant economic and social effects on the industry, the economy, and on small communities that depend on the scallop fishery.

Increasing the day-at-sea allocations to the 1998 levels (Alternative 1) would unacceptably decrease the probability of achieving the 2000 fishing mortality targets. Net benefits would increase only marginally by \$3.7 million relative to the proposed action, but would decrease yield and gross revenue by 5 to 10 percent during the 2001 fishing year.

Although the long-term consequences of more days-at-sea in 2000 are small (Section 6.2.6.2), Amendment 7 has a lower fishing mortality target in 2001 and future years. A higher day-at-sea allocation in 2000 would increase fishing effort from 1999 levels, followed by a more drastic reduction in 2001. This change could be magnified if 1999 recruitment is below average. It is therefore preferable to be slightly more risk averse in 2000 and expedite stock rebuilding to lessen the effects of future management actions to meet lower fishing mortality targets.

More importantly, the Amendment 7 fishing mortality targets are expected to rebuild stock biomass to target levels in 7 years (2005) for Georges Bank and 5 years (2003) in the Mid-Atlantic. These rebuilding projections are slightly different than those in the SAFE report due to changes explained in Section 6.2.6.2. This expectation satisfies the SFA mandate of rebuilding biomass to target levels in 10 years or less, but remains slightly longer than the five-year goal of the overfishing definition control rule. According to the control rule, when scallop stock biomass is less than 50 percent of B_{MSY} (as it is for the Mid-Atlantic stock), the goal is to rebuild more quickly as a risk adverse strategy. The Amendment 7 fishing mortality targets nearly achieve this goal (rebuilding in five, rather than ten years), but failing to achieve the fishing mortality target by allocating higher days (i.e. Alternative 1) would be risky.

3.2 Other Management Adjustments

Although the proposed action achieves the Amendment 7 fishing mortality targets and technically complies with SFA mandates, the disparity between fishing effort in the closed areas and that in the open areas increases costs and will, if continued, decrease yield below OY. Fishing mortality in the open areas is well above threshold reference points and scallops in these areas are therefore less abundant and small, compared to the scallops in the closed areas. The areas that are currently closed to scallop fishing are shown in Figure 1 and Figure 2.

Overharvesting in the open areas is therefore occurring. Scallops are being caught before reaching optimum size and stock rebuilding is stymied. In closed areas, on the other hand, scallops are large and eventually natural mortality will take its toll. Initially the protection afforded to scallops through closed areas helped to rebuild stock biomass (and coincidentally reduced total fishing mortality). The scallops in the Georges Bank closed areas are now of optimal size and from a scallop management perspective, should be harvested in 2000 (NEFMC 1999b), provided that the access does not increase total fishing mortality and does not adversely effect other fisheries. Scallops in the Mid-Atlantic closed areas are currently below optimum size, will promote stock rebuilding, and enhance future yield if they remain protected in the 2000 fishing year (NEFMC 1999b).

Since Framework Adjustment 12 is developed as an annual adjustment, the proposed action only addresses the targets and specifications for the 2000 fishing year. Originally, this action was coupled with provisions to allow access to some parts of closed areas where scallop biomass has rebuilt. Unresolved problems that were identified at the final framework meeting caused the Council to separate the proposed action from closed area access. Access to one or more of the Georges Bank closed areas is however intended in 2000 when these details are resolved in Framework Adjustment 13. A conservation-neutral access program will decrease fishing mortality in the open areas, promoting stock rebuilding and enhancing future yield from the open areas consistent with Amendment 7 and best management practices defined by the Magnuson Fishery Conservation and Management Act.

Although the future day-at-sea allocations for 2001 and future years appear to be incongruent with current conditions and management policy regarding closed areas, the proposed action only affects the 2000 fishing year specifications. The Council is now initiating Amendment 10, which will codify future policies with regard to area-based management and enable a longer-range strategy for the

combination of closed area and day-at-sea management. If there are no closed areas in 2001 or future years, then the Amendment 7 day-at-sea schedule would be necessary to achieve the fishing mortality and stock rebuilding objectives (NEFMC 1999b). It is therefore unreasonable to adjust day-at-sea allocations beyond the 2000 fishing year, until the long term strategy for closed areas is settled.

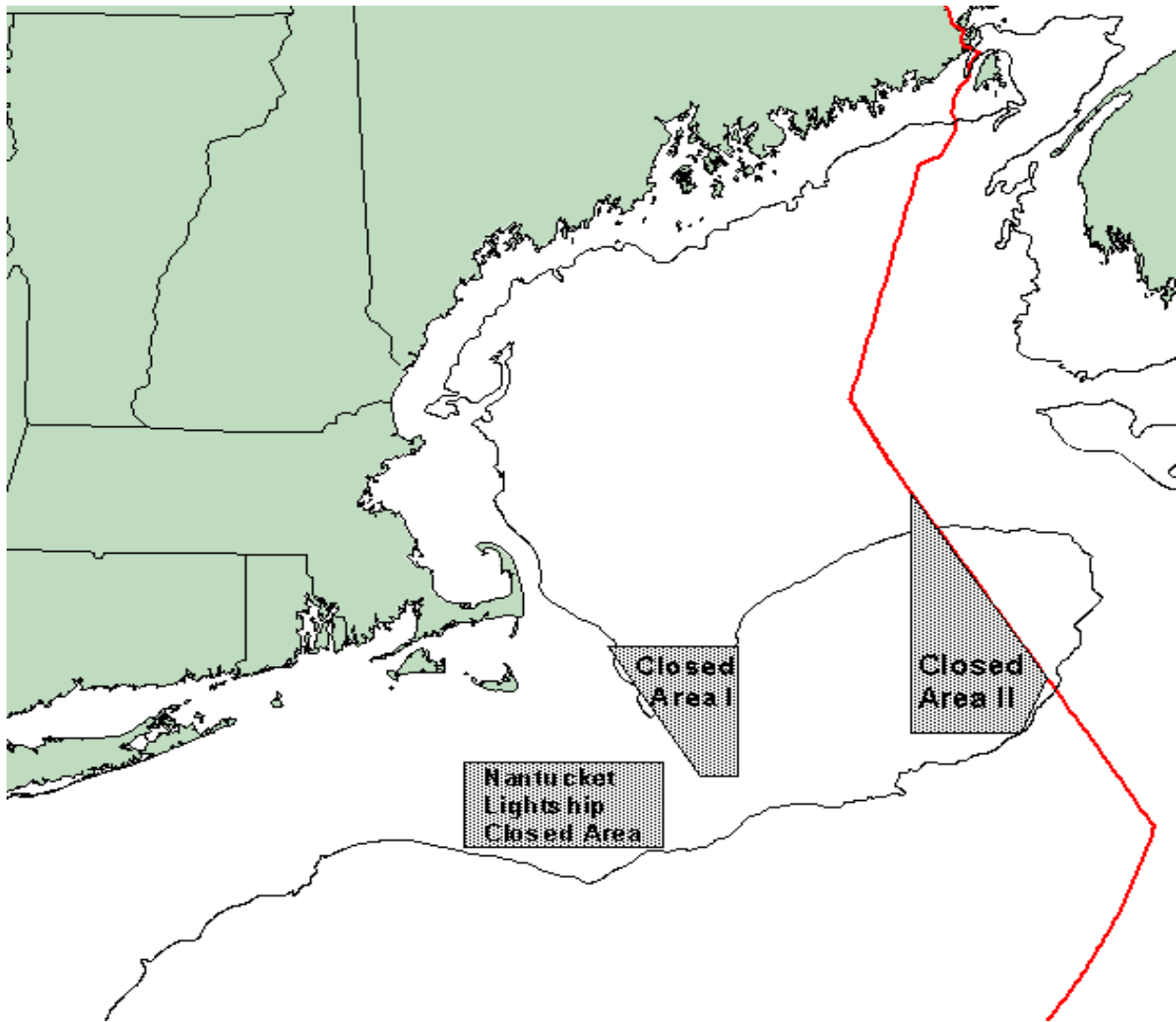


Figure 1. Location of groundfish closed areas closed to scallop vessels during December 1994.

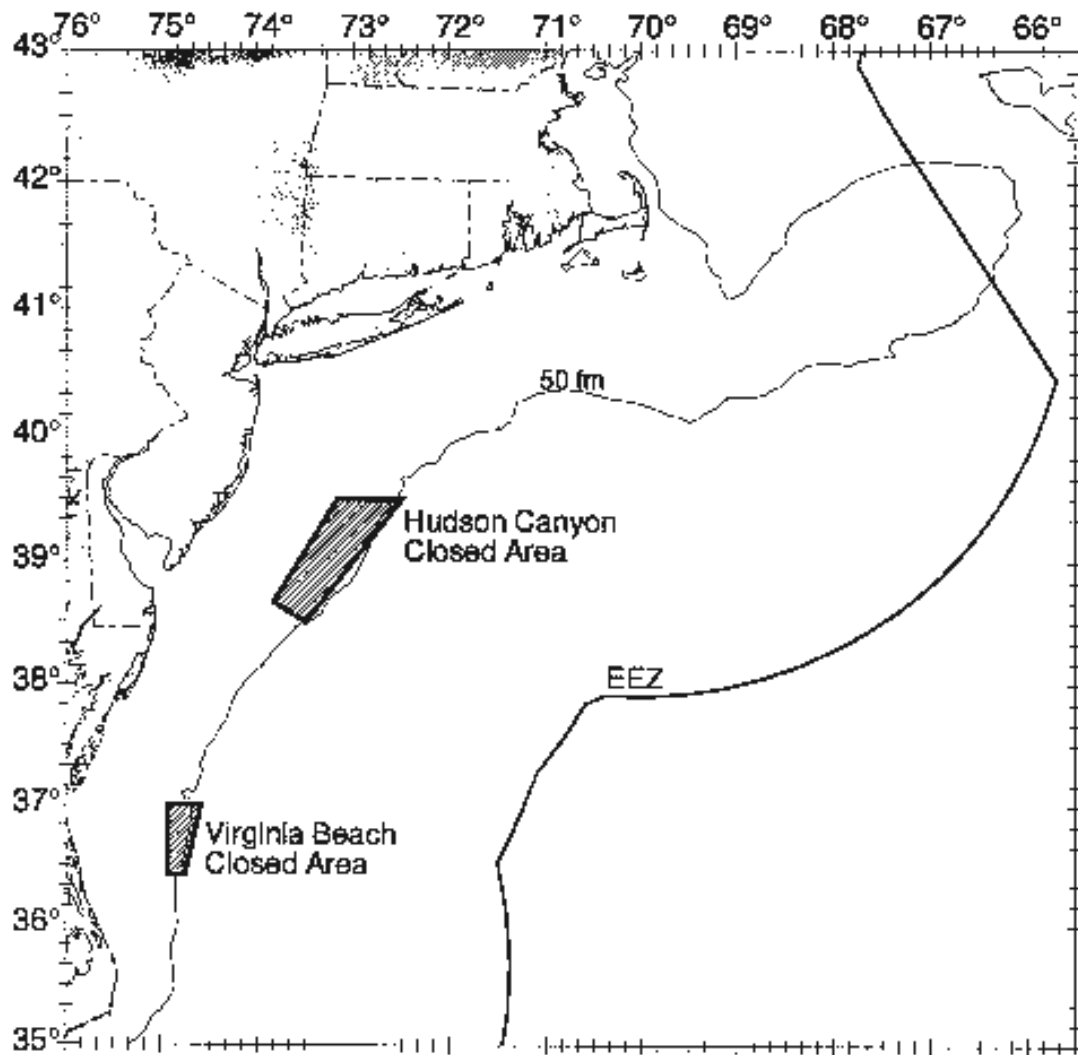


Figure 2. Location of scallop closed areas in the Mid-Atlantic closed during 1998 by emergency action and extended by Amendment 7.

4.0 ISSUES OF CONCERN

4.1 *FMP fishing mortality targets*

The 1999 SAFE report (NEFMC 1999b) found that the Amendment 7 mortality targets were consistent with the goals of the FMP. Changing the fishing mortality targets was therefore unnecessary, since they were still compliant with the SFA mandates and with Amendment 7. Increasing the status quo day-at-sea allocation was however necessary to achieve OY, avoid burdensome regulations with lower net benefits, and meet the Amendment 7 mortality targets.

The initial evaluation in the SAFE report indicated that continuation of the 1999 day-at-sea allocations had a better than even chance of achieving the mortality targets for the 2000 fishing year,

provided that access to closed areas or activation of unused permits did not increase mortality. The day-at-sea use in the 2000 fishing year was projected to generate 25,279 days for Alternative 1 (Table 8; 142 day-at-sea for full-time vessels), 24,189 days for Alternative 2 (Table 9; the proposed action; 120 day-at-sea for full-time vessels), and 11,096 days for the status quo (Table 10; 51 day-at-sea for full-time vessels). Applying the revised regression between fishing mortality, day-at-sea use, and the proportion of biomass protected by closed areas (Section 6.2.6.1), the probability of exceeding the mortality target was estimated to be 47 percent, 44 percent, and 28 percent respectively.

4.2 Optimum Yield (OY)

Amendment 7 defines OY as “the product of the target fishing mortality rate under the selected rebuilding timeframe and the biomass level of the scallops large enough to be caught (recruits). Expressed mathematically, $OY = F_{\text{target}} * \text{mean } B_t$. According to National Standard 1, the Council may choose to adjust OY to be risk adverse and prevent the fishery from exceeding the mortality thresholds. For the 2000 fishing year, the threshold mortality rate is 0.34 and the Council has chosen a day-at-sea allocation that has a better than even chance of being below this threshold. For 2000, the OY from the open areas is therefore equal to 8,294 mt (18.3 million lbs.; Table 13) for the Georges Bank stock and 11,939 mt (26.3 million lbs.; Table 17) for the Mid-Atlantic stock, assuming a 40 percent dredge efficiency. If the efficiency of the survey dredge is greater than 40 percent, then the OY would be less and vice versa.

OY could be enhanced however by reducing mortality in the open areas while allowing controlled fishing effort in closed areas, especially on Georges Bank. The Council is considering allowing access to the closed areas on Georges Bank in ways that are conservation-neutral and do not exceed a sustainable harvest for each area individually. New management measures including specific boundaries, seasons, possession limits, and day-at-sea tradeoffs will be included in Framework Adjustment 13. It is not anticipated that access to closed areas will jeopardize the rebuilding program or decrease the ability of the proposed action to meet the Amendment 7 mortality targets.

4.3 Stock Rebuilding

The new analyses show that with median recruitment from 1999 to 2008, the Amendment 7 mortality schedule would achieve the biomass target in 7 years (2005) for the Georges Bank stock and in 5 years (2003) for the Mid-Atlantic stock. These projections, similar to Amendment 7, assume that all areas will be fished at the target mortality rate beginning in 2001. In the 2000 fishing year, the biological projections assume that the Georges Bank closed areas are fished with a TAC consistent with the Framework Adjustment 11 strategy and that the Mid-Atlantic areas remain closed.

The annual fishing mortality targets were set by Amendment 7 to rebuild the biomass to the FMP targets by 2008. As long as fishing mortality remains below the annual targets, the action should not jeopardize the Amendment 7 rebuilding program, especially if the fishery reduces its catch of small, faster-growing scallops to target large, slower-growing scallops. The higher productivity of young scallops (at least in terms of growth) would promote rebuilding faster than if the closed areas did not re-open.

5.0 PROPOSED ACTION AND REJECTED ALTERNATIVES

5.1 *Proposed Action: Increase day-at-sea allocations to 120 full-time, 48 part-time, and 10 occasional during the 2000 fishing year (Alternative 2)*

The framework adjustment proposes to adjust the day-at-sea allocations in the 2000 fishing year to be consistent with Amendment 7 fishing mortality targets. The following sections describe the proposed action to adjust the annual day-at-sea allocations for limited access scallop vessels. If the proposed action is approved and implemented, full-time scallop vessels would receive 120 days-at-sea to fish for scallops during March 1, 2000 to February 28, 2001. Part-time vessels would receive 48 days-at-sea and occasional vessels would receive 10 days-at-sea. Up to 10 unused days-at-sea from 1999 may be carried over by some limited access vessels into the 2000 fishing year.

The proposed action (Alternative 2) would increase the day-at-sea allocations to 1999 levels. Vessels issued full-time limited access scallop permits in 2000 would receive 120 days to fish for scallops from March 1, 2000 to February 28, 2001 with dredges or trawls (if authorized). This is a 131 percent in allocated days-at-sea, taking into account the projected carry-forward of unused days in 1999. Vessels with part-time permits would receive 48 days and vessels with occasional permits would receive 10 days to fish for scallops during March 1, 2000 to February 28, 2001.

Rationale: Allocating days-at-sea at the 1999 levels to vessels with limited access scallop permits would generate 24,189 to 26,995 days of fishing effort, as measured by the Vessel Monitoring or Call-in Systems. With the five areas closed to scallop fishing (three groundfish areas on Georges Bank and two scallop areas in the Mid-Atlantic), this option is estimated to have a slightly better than 50 percent chance of achieving the Amendment 7 mortality reduction.

The analysis of this option is given in Section 6.2.6.1. The odds of achieving the mortality target improve by about 3 percent compared to Alternative 1, but more importantly there would be less opportunity to increase fishing mortality by increasing the use of allocated days. Unused days under this alternative would be cut by 48 percent (3,570 vs. 7,503) compared to Alternative 1. The proposed action would therefore have a better chance to achieve the fishing mortality target than the analysis indicates and it would better account for the uncertainty in the model assumptions and closed area access policies. Net benefits would increase by \$64.8 million (Section 6.2.7.6). Producer surplus would increase by \$35.4 million and consumer surplus would increase by \$29.5 million.

5.2 *Alternatives Considered but Rejected*

5.2.1 Increase day-at-sea allocations to 142 full-time, 57 part-time, and 22 occasional during the 2000 fishing year (Alternative 1)

Alternative 1 would increase the day-at-sea allocations to 1998 levels. Vessels issued full-time limited access scallop permits in 2000 would receive 142 days to fish for scallops from March 1, 2000 to February 28, 2001 with dredges or trawls (if authorized). This is a 173 percent in allocated days-at-sea, taking into account the projected carry-forward of unused days in 1999. Vessels with part-time permits would receive 57 days and vessels with occasional permits would receive 22 days to fish for scallops during March 1, 2000 to February 28, 2001.

Rationale: Allocating days-at-sea at the 1998 levels to vessels with limited access scallop permits would generate 25,279 to 28,193 days of fishing effort, as measured by the Vessel Monitoring or Call-in Systems. With the five areas closed to scallop fishing (three groundfish areas on Georges Bank and two scallop areas in the Mid-Atlantic), this option is estimated to have a slightly better than 50 percent chance of achieving the Amendment 7 mortality reduction. The analysis of this option is given in Section 6.2.6.1. Access to closed areas with conservation-negative policies would decrease the probability of achieving the resource-wide fishing mortality objective.

Net benefits would increase by only \$3.7 million relative to the proposed action (Section 6.2.7.6), but would decrease yield and gross revenue by 5 to 10 percent during the 2001 fishing year (Section 6.2.6.2). Compared to the proposed action, 81 percent of the net benefits would arise from an increase in consumer surplus (Section 6.2.7.6). Producer surplus for Alternative 2 and the proposed action are virtually identical.

5.2.2 51 full-time, 20 part-time, and 4 occasional day-at-sea allocations during the 2000 fishing year (Status quo)

According to the current schedule, vessels issued a full-time limited access scallop permits in 2000 would receive 51 days to fish for scallops from March 1, 2000 to February 28, 2001 with dredges or trawls (if authorized). Vessels with part-time permits would receive 20 days and vessels with occasional permits would receive 4 days to fish for scallops during May 1, 2000 to April 30, 2001.

Rationale: This allocation would be necessary to meet the mortality targets if all areas were open to fishing. This prediction is consistent with the analysis and assumptions for Amendment 7. According to the new analysis, which accounts for the protection afforded by closed areas, there would be about a 72 percent chance of achieving the Amendment 7 fishing mortality objective for the 2000 fishing year. This is a highly conservative allocation given current conditions and would produce significant reductions in net benefits (Section 6.2.7.6).

6.0 CONSISTENCY WITH APPLICABLE LAW

6.1 *Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) – Consistency with National Standards*

6.1.1 National Standard 1 – Optimum Yield

“Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry.”

The proposed action adjusts the day-at-sea allocations to be consistent with the fishing mortality targets and rebuilding schedule adopted in Amendment 7. Amendment 7 included a new overfishing definition, a control rule, and a rebuilding schedule that was determined to be consistent with National Standard 1.

6.1.2 National Standard 2 – Scientific Information

“Conservation and management measures shall be based upon the best scientific information available.”

All available information and detailed studies of the 1998 and 1999 experimental fishery were used to assess the impacts of various management alternatives and options. This information includes the latest data on day-at-sea use, vessel trip reports, landings, and sea sampling observations (NEFMC 1999b). Projections of the effects of various options on biomass and fishing mortality were based on the 1998 research survey. At the time of submission of the proposed action, the 1999 Albatross research survey had just been completed and the data from that survey were not yet available for analysis.

The available data and the analyses that were used for evaluating the management alternatives were developed and reviewed by the Scallop Plan Development Team. The PDT includes scientists from academia, states, NMFS, and the Council staff. The information used in these analyses and the preliminary analysis of options in the SAFE report were reviewed by the Council Scientific and Statistical Committee and its Social Sciences Advisory Committee. Many of the issues raised by these committees were addressed in this document.

6.1.3 National Standard 3 – Management Units

“To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.”

Atlantic sea scallops are managed as a single unit. There are no differences in EEZ regulations throughout the range of the scallop resource. The proposed action does not alter the management unit.

6.1.4 National Standard 4 – Allocations

“Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be:

- *Fair and equitable to all such fishermen*
- *Reasonably calculated to promote conservation*
- *Carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.”*

The proposed action does not: 1) make any allocations of fishing privileges based on state residency; 2) change the way day-at-sea allocations or fishing privileges are allocated among limited access scallop permit holders or 3) encourage particular individuals, corporations, or other entities to acquire an excessive share of such privileges.

6.1.5 National Standard 5 – Efficiency

“Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.”

Amendment 7 and its fishing mortality targets promotes overall efficiency in the fishery by reducing the long-term fishing effort to that which will rebuild the resource and produce the maximum sustainable yield. The proposed action achieves this goal by reducing the mortality through the adjusted day-at-sea allocations, the limited access program, and the existing area closures. As expected by Amendment 7, catch rates will increase in the 2000 fishing year and are expected to continue increasing in future years as scallop biomass rebuilds to the targets.

The Council intends to address the imbalance between high fishing effort in the open areas and high biomass in the closed areas by considering access programs in Framework Adjustment 13. Keeping the areas with high stock biomass closed will decrease efficiency by concentrating fishing effort in less productive areas. Originally these provisions were part of Framework Adjustment 12, but had to be separated from the day-at-sea adjustments due to unresolved issues at the final framework meeting.

6.1.6 National Standard 6 – Variations and Contingencies

“Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.”

The purpose of the annual framework adjustment process and the proposed day-at-sea adjustment is to respond to the changing resource conditions and the conservation effect caused by the build up of scallop abundance and biomass in the closed areas. This added protection allows the FMP to achieve the mortality goals for the 2000 fishing year with day-at-sea allocations that remain constant, relative to 1999. One of the reasons why the Council chose the proposed action over an alternative with higher day-at-sea allocations was that the increase in days from 1999 levels might have to be reduced to meet lower fishing mortality targets in 2001. This reduction might have to be greater than anticipated if recruitment in 1999 is below average.

6.1.7 National Standard 7 – Costs and Benefits

“Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.”

The proposed action adjusts already existing measures and does not include any additional measures to be implemented at this time.

6.1.8 National Standard 8 – Communities

“Conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to:

- Provide for the sustained participation of such communities; and*
- To the extent practicable, minimize adverse economic impacts on such communities.”*

The proposed action is anticipated to increase net benefits and producer surplus. The value of landings is expected to be \$61 million higher than the status quo. This added value is expected to improve the economies of communities that depend on the scallop fishery.

6.1.9 National Standard 9 – Bycatch

“Conservation and management measures shall, to the extent practicable:

- Minimize bycatch; and*
- To the extent bycatch cannot be avoided, minimize the mortality of such bycatch.”*

Framework Adjustment 11 increased the twine top mesh size from 5 ½ to 8 inches, effective December 16, 1999. The twine top is the primary location where finfish often escape the dredge and the larger mesh is expected to improve escapement, especially of flatfish. To the extent that the proposed action increases fishing effort relative to status quo, it would increase bycatch. Part of the reason that higher day-at-sea allocations are justified however is because of the effect of closed areas on conservation. Since the Georges Bank closed areas were designed to protect groundfish, this protects species that would otherwise be caught as bycatch in the scallop fishery.

At present there is not enough reliable data to estimate the bycatch in the scallop fishery; either the bycatch of scallops not landed or the bycatch of other species. Although scallop permit holders must submit vessel trip reports (VTR) on which they are required to estimate bycatch, the VTR system is not a reliable method for gathering information about bycatch. There has been sea sampling of some scallop trips, but not enough to provide reliable estimates of bycatch for the whole fishery. Either the VTR program should be overhauled to collect reliable information or the observer program should be enhanced to provide a statistically valid sample for this fishery.

6.1.10 National Standard 10 – Safety of Life at Sea

“Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.”

The day-at-sea system allows fishermen to choose the locations and seasons to fish, possibly avoiding adverse weather and circumstances that might endanger safety. The proposed action would maintain the day-at-sea allocations at the 1999 levels, generating no new safety concerns.

6.2 National Environmental Policy Act (NEPA) – Environmental Assessment

The proposed action is not significant for the purposes of preparing an Environmental Impact Statement (EIS). The most recent EIS documents for the Atlantic Sea Scallop FMP adequately describe the fishery, the resource, the biological, and the human environment. The proposed action in this Framework Adjustment does not change the goals, objectives, or rebuilding plans for sea scallops and the scope of this framework adjustment only includes the 2000 fishing year for sea scallops. This Environmental Assessment (EA) estimates and describes the potential impacts of the proposed action in the context of the existing management measures for sea scallops.

6.2.1 Purpose and Need for the Proposed Action

The purpose and need for the proposed Framework Adjustment is described in Section 3.0.

6.2.2 Description of the Proposed and Alternative Actions

The description and rationale for the proposed measures is described in Section 3.0.

6.2.3 Description of the Physical Environment

The physical environment is described in the EIS for Amendment 7 to the Atlantic Sea Scallop FMP.

6.2.4 Description of the Biological Environment

The biological environment is described in the EIS for Amendment 7 to the Atlantic Sea Scallop FMP.

6.2.5 Description of the Human Environment

The human environment is described in the EIS for Amendment 7 to the Atlantic Sea Scallop FMP.

6.2.6 Biological Impacts Of The Proposed Action (Section 5.1)

The relationship between fishing mortality and day-at-sea use and closed area management was re-evaluated, using the most recent data available. According to this assessment, the closed areas provide considerable conservation benefit and allow the FMP to meet the total mortality objectives at higher day-at-sea allocations (Section 6.2.6.1). New biological projections indicate that the Amendment 7 mortality schedule complies with the Amendment 7 rebuilding schedule and the SFA mandates (Section 6.2.6.2).

6.2.6.1 Fishing mortality prediction and day-at-sea use for the 2000 fishing year

The biological objective, established by Amendment 7 for the 2000 fishing year, is to achieve a fishing mortality rate equal to 0.34. The 2000 fishing year is the second of four reductions to stop overfishing and rebuild the resource to established biomass targets. The target mortality rate in 1999 was 0.83 and the target for 2001 is 0.28.

Two important evaluations are needed to adjust the day-at-sea allocations and achieve the Amendment 7 objectives. The first, addressed by this section, is an assessment of whether the day-at-sea options achieve the 2000 fishing mortality target. The second, addressed by the next section, is whether the fishing mortality target for 2000 is still consistent with the rebuilding goals of the plan.

Initial assessments of both criteria were contained in the annual SAFE report (NEFMC 1999b), indicating that the 1999 day-at-sea allocations (120 days for full-time vessels) would achieve the fishing mortality target if applied in the 2000 fishing year. Keeping the day-at-sea allocations the same as in 1999 would also allow time for NMFS to sort out the uncertainties in the previous assessment and time for the Council to define the management policy with regard to area-based management. The SAFE report also indicated that continuing the Amendment 7 fishing mortality schedule, either for all areas open or with the current management areas remaining closed, would achieve the rebuilding targets within ten years or less. In fact, the new rebuilding projections were more optimistic than previous assessments due to the rebuilding of biomass in closed areas and due to favorable recruitment in 1998.

To make this assessment, the PDT relied on a linear regression between days-at-sea used by limited access vessels (days absent prior to 1994), the proportion of scallop biomass in the closed areas, and fishing mortality. A zero intercept was assumed since zero fishing mortality is expected when day-at-sea allocations are zero and all the biomass is in closed areas. This model explained 91 percent of the variance and was highly significant. The PDT rejected using data prior to 1990 due to:

- ◆ different regulatory environment (meat count)
- ◆ reporting bias (days absent assigned by port agents; underreported landings, some states did not begin reporting until as late as 1990)
- ◆ labor unions
- ◆ changes in commercial catchability (vessel construction)

During the review by the Council's Scientific and Statistical Committee, the regression was criticized for assuming a zero regression when an alternative indicated that a non-zero intercept may be significant, omitting data that appeared to not fit the regression, and for not applying a penalty on the predictions for assuming a zero intercept. The SSC recommended that the Council further investigate other models that included more or all available data as well as models where the intercept was estimated.

While the PDT disagreed with the SSC's reason for why it omitted the earlier data set, the PDT evaluated six other models to explain the relationship between fishing mortality, day-at-sea use, and biomass in closed areas. These models, including the one in the SAFE report are shown below:

Table 6. Results of alternative linear regression models. Model VI was accepted by the PDT and used to estimate the probability of achieving the fishing mortality target ($F=0.34$) for the 2000 fishing year.

	Model I ³	Model II ⁴	Model III ⁵	Model IV ⁶	Model V ⁷	Model VI ⁸
R ²	0.94	0.96	0.52	0.84	0.88	0.82
Significance	<0.001	<0.001	<0.01	<0.001	<0.001	<0.005
Degrees of freedom	7	6	13	11	10	11
Intercept	0	-0.71	0	0	0.30	0
B1 (DAS)	1.97e ⁻⁵	3.58e ⁻⁵	2.29e ⁻⁵	2.12e ⁻⁵	1.35e ⁻⁵	0.56e ⁻⁵
B2 (% closed)	-0.46	-0.14	-0.61	-0.53	-0.62	0.59

Model I (adjusted for assuming a zero intercept) explained 94 percent of the variance, with a slope equal to a .197 increase in fishing mortality for every 10,000 days used and a 0.46 increase in fishing mortality when all areas are open to fishing. Models II through IV had larger slopes for the day-at-sea variable. Model III used all available data, but only explained 52 percent of the variance.

Model VI omitted 1983 and 1984 data, because Canadian waters were open to scalloping by US vessels and labor unions influenced how vessels could operate prior to 1985. Both factors probably affected catchability and the relationship between days absent and fishing mortality. A trial regression estimated a non-significant intercept, so the PDT decided to drop the intercept term and adjust the standard error by dividing the sum of squares by $n - 2$, instead of $n - 1$, increasing the model variance around the fishing mortality estimates.

With a 142 day-at-sea allocation for full-time vessels, the regression predicts that fishing mortality would 0.26 to 0.28 (Table 7). The upper bound for the 95% confidence interval is above the 0.34 fishing mortality target and the regression predicts a 41 to 47% chance of being above the target. With a 120 day allocation, the day-at-sea use is expected to be four percent less than with 142 days (assuming that day-at-sea use would have the same pattern as occurred in 1998) and fishing mortality is predicated to be 0.26 to 0.27, with a 38 to 44 percent chance of being above the annual fishing mortality target.

Under the status quo (51 days-at-sea), day-at-sea use is expected to be about fifty-six percent less than with 142 days. Fishing mortality is expected to be 0.18 to 0.19 with a 28 percent chance of being above the annual fishing mortality target. Due to the larger model uncertainty with the low day-at-sea estimates, the upper bound for the 95% confidence interval is still above the fishing mortality target, but the reduced days have a better chance of meeting the fishing mortality objective.

Table 7. Projected fishing mortality and probability of exceeding the 2000 mortality target with various day-at-sea allocations in the 2000 fishing year, assuming a catch of 3,678 mt in Closed Area II (Section 6.2.6.2)⁹. The 142 day-at-sea option is equivalent to the allocations for the 1998 fishing year and the 120 day-at-sea

³ PDT consensus – 1990-1998; zero intercept.

⁴ 1990-1998; non-zero intercept (estimated).

⁵ 1982-1998; zero intercept.

⁶ 1984-1998; zero intercept.

⁷ 1984-1998; non-zero intercept (estimated).

⁸ 1984-1998; zero intercept; b_2 = percent of biomass in open areas

⁹ Landings of 3,678 mt are currently expected when the yellowtail flounder TAC is taken and the fishery closes, based on estimates as of 10/18/99.

option is equivalent to the day-at-sea allocations in 1999. The 51 day-at-sea option is the current schedule under Amendment 7.

Year (full-time day-at-sea allocations)	Actual or projected days used	Percent of biomass in open areas ¹⁰	Actual or projected fishing mortality	Standard error	Upper 95% confidence limit	Probability of exceeding the 2000 mortality target
1998 (142 days)	27,208	20.3%	0.171	-	-	-
1999 (120 days & 6 CA II trips)	19,560	23.9%	0.250	0.105	0.480	40%
247 active¹¹ vessels in 1998 and 81 vessels with active permits¹²						
2000 (142 days)	28,193	20.8%	0.280	0.081	0.458	47%
2000 (120 days)	26,995	20.8%	0.273	0.084	0.458	44%
2000 (51 days)	12,363	20.8%	0.191	0.133	0.483	28%
247 active vessels in 1998						
2000 (142 days)	25,279	20.8%	0.264	0.089	0.459	41%
2000 (120 days)	24,189	20.8%	0.257	0.092	0.460	38%
2000 (51 days)	11,096	20.8%	0.184	0.138	0.486	28%

According to the regression, the quantitative differences between a 142 day and a 120 day allocations are small. Although all of the day-at-sea allocation options meet the fishing mortality objective with greater than 50 percent probability, there are good qualitative reasons to avoid raising day-at-sea allocations to the limit implied by the above regression. Based on these results and the reasons given below, the PDT does not recommend raising day-at-sea allocations above the levels in 1999. The status quo day-at-sea allocation (51 days) appears to be too conservative for current conditions and the status of closed areas, however.

The reasons to be somewhat cautious with these results include:

- ◆ Possible temporal changes in the day-at-sea to fishing mortality relationship caused by changing fishing practices with varying conditions
- ◆ Uncertainty about the catch and conservation equivalency in Closed Area II¹³
- ◆ Unreported catch and discard mortality that are not accounted for in the assessment
- ◆ Uncertainty in the assessment results, an index level assessment that for Georges Bank is influenced by the large tows in stratum 54 within Closed Area I.

¹⁰ At the beginning of the calendar year, starting with 1999. The 1998 estimate is at the time of the annual research survey.

¹¹ An active vessel is defined as one that reported the use of at least one scallop day-at-sea.

¹² At least 14 of these vessels are known to have taken at least one trip to Closed Area II during 1999.

¹³ The scallop TAC was estimated with an assumption of 25 percent dredge efficiency. This appears to have overestimated a conservation-neutral TAC (NEFMC 1999a), but the yellowtail flounder TAC may close the Closed Area II fishery before the scallop TAC is landed. The scientifically accepted dredge efficiency estimate for Closed Area II is 40%, while declining LPUE in Closed Area II and comparisons of photographic and dredge surveys in other closed areas are more consistent with a 40 percent dredge efficiency.

- ◆ Higher day-at-sea allocations reduce the probability of meeting the 2000 fishing mortality target.
- ◆ Based on Amendment 7 strategies and mortality targets, long-term yield would be less for 142 days than for 120 days. This may change, however, under currently undefined area based management strategies.
- ◆ Fewer day-at-sea allocations (compared to 142 full time days) would allow for a little more flexibility in determining conservation-neutral strategies to fish for scallops in the groundfish closed areas.
- ◆ The potential for increasing day-at-sea use in response to improving biological conditions or access to closed areas¹⁴. A higher day-at-sea allocation would provide more economic incentive to use latent effort, especially if there is continued and greater access to the groundfish closed areas.
- ◆ More latent effort (i.e. unused days and inactive permits) could be reactivated for 142 days-at-sea (16,955 unused days) vs. 120 days-at-sea (10,289 unused days).
- ◆ A higher day-at-sea allocation would reduce the opportunity for rebuilding biomass in the areas that are now open for scallop fishing. There appears to be a strong 1998 year-class available that would promote rebuilding if fishing effort is held in check.
- ◆ The fishing mortality target in 2001 declines to 0.28 with further decreases to 0.15 in 2004. Increasing days in 2000, then decreasing them in 2001 to meet a lower fishing mortality target could be disruptive to industry.
- ◆ Lower fishing mortality and more day-at-sea reductions would be necessary in the future to achieve rebuilding targets if future recruitment is poor. The strength of the 1999 year-class is not yet available and projections assumed median recruitment for 1999 to 2008.
- ◆ There is considerable uncertainty in the strength of the 1998 year-class. Biomass estimates for Georges Bank in 1998 are being driven by a few very large tows in Closed Area I. If these tows are anomalously high, then recruitment and biomass may not be as great as used in the projections.

The day-at-sea projections for 1999 and 2000, given in the SAFE report (NEFMC 1999b), were updated to include the effects of the supplemental trip allocation for the Closed Area II scallop fishery program. The Regional Administrator allocated three additional trips to any limited access scallop vessel that made at least one trip to Closed Area II prior to September 1, 1999. According to the VMS data as of October 4, 156 vessels were eligible to take more trips. The following analysis assumed that the 178 vessels that so far fished in Closed Area II would take all of their three trips and the eligible 156 vessels would take all of the six trips allocated to those vessels.

If the Closed Area II fishery remained open through December 31 and the 178 vessels took all possible trips, there would be 1,002 trips that accumulated 10,002 day-at-sea. Based on this assumption, the total day-at-sea used (i.e. actually fished) in 1999 would decline to 19,560 days. Including the effect

¹⁴ As of 10/14/98, 14 additional vessels made at least one trip to closed areas, but had not fished at all for scallops during 1998.

on the potential 10-day carry over for each vessel, the calculated days allocated is 32,782 days for a 142 day full-time allocation (Table 6), 27,759 days for a 120 full-time allocation in 2000 (Table 9), and 14,844 days for a 51 day full-time allocation (Table 10).

Under these conditions and assuming no access to closed areas during 2000, the projected day-at-sea use for active vessels is 25,279; 24,189; and 11,096 days respectively. If the 81 vessels with active permits that did not fish for scallops in 1998 operated like an ‘active’ vessel, then it would add 2,914; 2,806; and 1,267 days, respectively. These day-at-sea use projections were applied to the above regression to estimate the probability of various day-at-sea allocations to meet the annual fishing mortality target.

Table 8. Projected day-at-sea use for 1999 and 2000 fishing years with a 120 and 142 day-at-sea allocations, respectively, assuming that eligible vessels take six trips into Closed Area II during 1999.

	Full-time	Part-time	Occasional	Total
Number of permits				
Active vessels	217	27	3	247
Inactive vessels	19	16	46	81
Confirmation of permit histories	21	14	2	37
Total	257	57	51	365
1998 DAS allocations with carryover-active vessels only	30,719	1,693	44	32,456
1998 DAS-used	25,955	1,227	26	27,208
% DAS-used of total allocation with carryover	84%	72%	60%	84%
1999 DAS Allocations (without carryover)	120	48	10	
Active vessels	26,040	1,296	30	27,366
Inactive vessels	2,280	768	460	3,508
Total allocation	28,320	2,064	490	30,874
1999 DAS Allocations (with carryover)				
Active vessels	26,296	1,339	30	27,665
Inactive vessels	2,280	768	460	3,508
Total allocation	28,576	2,107	490	31,173
1999 Projected DAS-used				
Active vessels only	23,727	1,033	12	24,772
% DAS-used of total allocation with carryover	90%	77%	39%	90%
Inactive vessels (if fished in 1999)	2,057	593	181	2,830
Total potential DAS-used	25,784	1,626	192	27,602
1999 Projected DAS-used, accounting for Closed Area II fishery				
Active vessels only	18,510	1,028	22	19,560
% DAS-used of total allocation with carryover	70%	77%	73%	71%
Inactive vessels within Closed Area II	102	12	0	114
Total expected DAS-used	18,612	1,040	22	19,674
Change from expected DAS-used	-22%	1%	85%	-21%
2000 DAS Allocations (without carryover)	142	57	12	
Active vessels	30,814	1,539	36	32,389
Inactive vessels	2,698	912	552	4,162
Total allocation	33,512	2,451	588	36,551
2000 DAS Allocations (with carryover)				
Active vessels	32,557	1,665	46	34,268
Inactive vessels	2,698	912	552	4,162
Confirmation of permit histories	2,982	798	24	3,804
Total allocation	38,237	3,375	622	42,234
Percent of DAS on inactive vessels	15%	51%	93%	19%
2000 DAS Allocations (accounting for CA2 fishery)				
Active vessels	31,101	1,635	46	32,782
Inactive vessels	2,698	912	552	4,162
Confirmation of permit histories	2,982	798	24	3,804
Total allocation	36,781	3,345	622	40,748
Percent of DAS on inactive vessels	15%	51%	93%	20%
Change from expected DAS-allocated	-3.8%	-0.9%	0.0%	-3.5%
2000 Projected DAS-used				
Active vessels only	24,098	1,157	24	25,279
% DAS-used of total allocation with carryover	74%	69%	51%	74%
Inactive vessels (if fished in 2000)	1,997	634	284	2,914
Total potential DAS-used	26,095	1,791	307	28,194
2000 Projected DAS-used (accounting for 1999 Closed Area II fishery)				
Active vessels only	24,098	1,157	24	25,279
% DAS-used of total allocation with carryover	77%	71%	51%	77%
Inactive vessels (if fished in 2000)	1,997	634	284	2,914
Total potential DAS-used	26,095	1,791	307	28,194
Change from expected DAS-used	0.0%	0.0%	0.0%	0.0%

Table 9. Projected day-at-sea use for 1999 and 2000 fishing years with a 120 and 120 day-at-sea allocations, respectively, assuming that eligible vessels take six trips into Closed Area II during 1999.

	Full-time	Part-time	Occasional	Total
Number of permits				
Active vessels	217	27	3	247
Inactive vessels	19	16	46	81
Confirmation of permit histories	21	14	2	37
Total	257	57	51	365
1998 DAS allocations with carryover-active vessels only	30,719	1,693	44	32,456
1998 DAS-used	25,955	1,227	26	27,208
% DAS-used of total allocation with carryover	84%	72%	60%	84%
1999 DAS Allocations (without carryover)	120	48	10	
Active vessels	26,040	1,296	30	27,366
Inactive vessels	2,280	768	460	3,508
Total allocation	28,320	2,064	490	30,874
1999 DAS Allocations (with carryover)				
Active vessels	26,296	1,339	30	27,665
Inactive vessels	2,280	768	460	3,508
Total allocation	28,576	2,107	490	31,173
1999 Projected DAS-used				
Active vessels only	23,727	1,033	12	24,772
% DAS-used of total allocation with carryover	90%	77%	39%	90%
Inactive vessels (if fished in 1999)	2,057	593	181	2,830
Total potential DAS-used	25,784	1,626	192	27,602
1999 Projected DAS-used, accounting for Closed Area II fishery				
Active vessels only	18,510	1,028	22	19,560
% DAS-used of total allocation with carryover	70%	77%	73%	71%
Inactive vessels within Closed Area II	102	12	0	114
Total expected DAS-used	18,612	1,040	22	19,674
Change from expected DAS-used	-22%	1%	85%	-21%
2000 DAS Allocations (without carryover)	120	48	10	
Active vessels	26,040	1,296	30	27,366
Inactive vessels	2,280	768	460	3,508
Total allocation	28,320	2,064	490	30,874
2000 DAS Allocations (with carryover)				
Active vessels	27,783	1,422	40	29,245
Inactive vessels	2,280	768	460	3,508
Confirmation of permit histories	2,520	672	20	3,212
Total allocation	32,583	2,862	520	35,965
Percent of DAS on inactive vessels	15%	50%	92%	19%
2000 DAS Allocations (accounting for CA2 fishery)				
Active vessels	26,327	1,392	40	27,759
Inactive vessels	2,280	768	460	3,508
Confirmation of permit histories	2,520	672	20	3,212
Total allocation	31,127	2,832	520	34,479
Percent of DAS on inactive vessels	15%	51%	92%	19%
Change from expected DAS-allocated	-4.5%	-1.0%	0.0%	-4.1%
2000 Projected DAS-used				
Active vessels only	23,857	1,106	22	24,984
% DAS-used of total allocation with carryover	86%	78%	54%	85%
Inactive vessels (if fished in 2000)	1,958	597	250	2,806
Total potential DAS-used	25,814	1,703	272	27,790
2000 Projected DAS-used (accounting for 1999 Closed Area II fishery)				
Active vessels only	23,065	1,102	22	24,189
% DAS-used of total allocation with carryover	88%	79%	54%	87%
Inactive vessels (if fished in 2000)	1,958	597	250	2,806
Total potential DAS-used	25,023	1,699	272	26,994
Change from expected DAS-used	-3.1%	-0.3%	0.0%	-2.9%

Table 10. Projected day-at-sea use for 1999 and 2000 fishing years with a 120 and 51 day-at-sea allocations, respectively, assuming that eligible vessels take six trips into Closed Area II during 1999.

	Full-time	Part-time	Occasional	Total
Number of permits				
Active vessels	217	27	3	247
Inactive vessels	19	16	46	81
Confirmation of permit histories	21	14	2	37
Total	257	57	51	365
1998 DAS allocations with carryover-active vessels only	30,719	1,693	44	32,456
1998 DAS-used	25,955	1,227	26	27,208
% DAS-used of total allocation with carryover	84%	72%	60%	84%
1999 DAS Allocations (without carryover)	120	48	10	
Active vessels	26,040	1,296	30	27,366
Inactive vessels	2,280	768	460	3,508
Total allocation	28,320	2,064	490	30,874
1999 DAS Allocations (with carryover)				
Active vessels	26,296	1,339	30	27,665
Inactive vessels	2,280	768	460	3,508
Total allocation	28,576	2,107	490	31,173
1999 Projected DAS-used				
Active vessels only	23,727	1,033	12	24,772
% DAS-used of total allocation with carryover	90%	77%	39%	90%
Inactive vessels (if fished in 1999)	2,057	593	181	2,830
Total potential DAS-used	25,784	1,626	192	27,602
1999 Projected DAS-used, accounting for Closed Area II fishery				
Active vessels only	18,510	1,028	22	19,560
% DAS-used of total allocation with carryover	70%	77%	73%	71%
Inactive vessels within Closed Area II	102	12	0	114
Total expected DAS-used	18,612	1,040	22	19,674
Change from expected DAS-used	-22%	1%	85%	-21%
2000 DAS Allocations (without carryover)	51	20	4	
Active vessels	11,067	540	12	11,619
Inactive vessels	969	320	184	1,473
Total allocation	12,036	860	196	13,092
2000 DAS Allocations (with carryover)				
Active vessels	12,810	666	22	13,498
Inactive vessels	969	320	184	1,473
Confirmation of permit histories	1,071	280	8	1,359
Total allocation	14,850	1,266	214	16,330
Percent of DAS on inactive vessels	14%	47%	90%	17%
2000 DAS Allocations (accounting for CA2 fishery)				
Active vessels	11,354	636	22	12,012
Inactive vessels	969	320	184	1,473
Confirmation of permit histories	1,071	280	8	1,359
Total allocation	13,394	1,236	214	14,844
Percent of DAS on inactive vessels	15%	49%	90%	19%
Change from expected DAS-allocated	-9.8%	-2.4%	0.0%	-9.1%
2000 Projected DAS-used				
Active vessels only	11,994	578	10	12,582
% DAS-used of total allocation with carryover	94%	87%	44%	93%
Inactive vessels (if fished in 2000)	907	278	82	1,267
Total potential DAS-used	12,901	855	92	13,848
2000 Projected DAS-used (accounting for 1999 Closed Area II fishery)				
Active vessels only	10,539	548	10	11,096
% DAS-used of total allocation with carryover	93%	86%	44%	92%
Inactive vessels (if fished in 2000)	907	278	82	1,267
Total potential DAS-used	11,446	825	92	12,363
Change from expected DAS-used	-11.3%	-3.5%	0.0%	-10.7%

6.2.6.2 Biomass and yield estimates

Although selection of the day-at-sea allocations is constrained by the biological objectives, higher day-at-sea allocations and realized fishing mortality rates have long-term consequences. The long-term differences are small because the projections assumed that the Amendment 7 fishing mortality schedule is achieved in all areas (currently open and closed areas). Thus the effects are similar for the projections beyond 2001 and the 2000 fishing year allocations have a marginal effect on the long-term results. If recruitment is low in 2000 and 2001, however, the effort reductions could be more drastic in the out years to achieve the lower fishing mortality targets during the Amendment 7 rebuilding schedule.

The short-term results are affected largely by the recent build-up of biomass in the closed areas and by the strong year class first observed in the 1998 survey. If these observations and data are accurate, significantly higher catches and biomass can be expected. Higher day-at-sea allocations in 2000 will of course produce higher yields in 2000 and greater economic benefits (Section 6.2.6.4). Conversely, the 2001 yield and net benefits will be lower than the status quo alternative for 2000, due to the higher catches expected for next year. These differences are explained in Section 6.2.6.2.

The biological projections in this section were analyzed independently of the closed area access options and therefore underestimate the benefits of rebuilding scallops in the open areas. These analyses were kept separate because there was insufficient time to delay the biological projections until the closed analysis could be completed. The closed area analysis, moreover, partly depends on the results from the biological projections since the latter data is used to determine the TACs and catch rates. The two independent analyses

1. The year 2000 F values in the 'open' areas were based on a regression of F vs. day-at-sea use (Section 6.2.6.1) and percent of biomass in the closed areas. The predicted change in fishing mortality from 1999 to 2000 from the regression was applied to the 1999 fishing mortality in open areas. These F values are consistent with the regression model, but do not take into account the potential shift in fishing effort that would be expected under any closed area access option.

6.2.6.2.1 Georges Bank

Accounting for the projected day-at-sea use for each option and for the proportion of biomass in the closed areas, the catch for 2000 is expected to be 9.3 to 9.8 percent higher than status quo for full-time day-at-sea allocations of 120 and 142 days, respectively (Table 11). Total biomass at the end of the year and catch in the following year (2001) is projected to be about 2½ percent less than the status quo alternative (51 days), which in turn gives a biomass estimate that is 2.3 to 2.4 percent less than the status quo at the end of 2001. The projection indicates that the plan would achieve the rebuilding objective in 2004 (year 6), although there are marginal differences in the biomass expected in that year (Table 12 to Table 14), assuming median recruitment in 2000 to 2004.

These projections for Georges Bank assume that fishing mortality in the open area during 2000 is consistent with that predicted by the analysis in Section 6.2.6.1. It also assumes that the catches in the three groundfish closed areas extract 20 percent of the beginning of the year biomass, equivalent to a calculated fishing mortality of 0.2. In 2001, the projections assume that all areas are open to fishing and the Amendment 7 fishing mortality objective (0.28) is achieved in all areas.

Table 11. Summary of Georges Bank projections for 2000 and 2001 calendar years.

Option	Change vs. status quo in 2000		Rebuilding projected to be achieved by:	Change vs. status quo in 2001	
	Catch	End of year biomass		Catch	End of year biomass
142 DAS	9.8%	-2.5%	2004	-2.6%	-2.4%
120 DAS	9.3%	-2.4%	2004	-2.5%	-2.3%
51 DAS	0.0%	0.0%	2004	0.0%	0.0%

Table 12. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 142 full-time days (equal to the 1998 allocation).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvSize	AvESize	AvECnt	Catch	Discard	Eggs	Landings	BM(MT)	explBM(MT)
1998	open			964.6	658.5	147.3	6.5	12.4	36.6				(MT)	8325	5683
1998	CL1			26699.9	24965.96	1605.6	16.6	19.9	22.8				assumes	36849	34456
1998	CL2-S			3172.5	2832.46	244.8	13	21.4	21.2				40%	7063	6306
1998	CL2-N			3615.1	3191.51	288.3	12.5	24.2	18.8				dredge	6331	5589
1998	NLS			4183.4	3761.78	248.4	16.8	26.9	16.9				eff	9169	8245
1998	Composite			4186.6	3725.6	314.07	13.3	20.8	21.8					67737	60279
1999	open	0.52	0.52	1704.8	1325.2	206.88	8.24	14.2	32.0	510.6	44.8	3909	4407	14713	11437
1999	CL1	0	0	37236.5	36776.7	1556.37	23.93	25.6	17.7	0	0	119298	0	51391	50756
1999	CL2-S	0.6	0.6	3105	2734.1	243.03	12.78	20	22.7	1652.2	56.4	11182	3678	6913	6087
1999	CL2-N	0	0	5599.3	5137.2	358.15	15.63	21.7	20.9	0	0	16915	0	9805	8996
1999	NLS	0	0	5638.2	5479.3	251.08	22.46	25.6	17.7	0	0	19076	0	12357	12009
1999	Composite	0.11	0.14	5882.7	5518.4	219.9	16.8	22.4	20.3	499.7	31.7	18215	8085	95179	89286
2000	open	0.6	0.6	2292.2	1898.6	235.66	9.73	15.8	28.7	973	60.8	6263	8397	19782	16385
2000	CL1	0.2	0.2	37540.5	37159.8	1266.34	29.64	32.1	14.1	7459.9	21.5	150711	10296	51810	51285
2000	CL2-S	0.47	0.47	3380.4	3028.4	252.47	13.39	20.2	22.5	1358.8	45.5	11564	3025	7526	6742
2000	CL2-N	0	0	8039.1	7670.2	421.36	19.08	24.3	18.7	0	0	25651	0	14078	13432
2000	NLS	0.2	0.2	5786.7	5688	215.86	26.81	30.3	15.0	1103.9	6.8	23143	2419	12683	12466
2000	Composite	0.26	0.29	6544	6199.9	245.3	19.1	25.5	17.8	1491.9	41.4	23699	24138	105879	100311
2001	open	0.28	0.28	3426.9	3024.5	284.65	12.04	18	25.2	688.7	29.9	9412	5943	29575	26101
2001	CL1	0.28	0.28	32466.8	32088.3	982.16	33.06	36.8	12.3	9723.3	28.4	147869	13419	44808	44286
2001	CL2-S	0.28	0.28	4175.5	3820.1	281.72	14.82	21.4	21.2	960	26.5	13646	2137	9296	8505
2001	CL2-N	0.28	0.28	8263.9	7908.1	397.35	20.8	26.9	16.9	2191	27.1	31885	3837	14472	13849
2001	NLS	0.28	0.28	5167.1	5070.9	177.15	29.17	34	13.4	1510.4	7.3	22911	3310	11325	11114
2001	Composite	0.28	0.28	6766.3	6418.9	241.5	19.8	26.7	17.0	1770.6	25.9	26066	28647	109475	103855
2002	open	0.24	0.24	4639.2	4235.5	324.57	14.29	20.4	22.3	873	26	14045	7534	40037	36553
2002	CL1	0.24	0.24	28074.1	27694.6	813.71	34.5	39.4	11.5	7178.4	24.4	131912	9907	38746	38222
2002	CL2-S	0.24	0.24	5048.2	4691.8	308.21	16.38	22.9	19.8	1023.4	22.9	17058	2279	11239	10446
2002	CL2-N	0.24	0.24	8509.7	8153.3	390.51	21.79	28.4	16.0	1932.1	22.9	33538	3383	14902	14278
2002	NLS	0.24	0.24	4655.3	4558.9	155.22	29.99	35.8	12.7	1156.6	6.2	21023	2535	10203	9992
2002	Composite	0.24	0.24	7115.6	6767.2	244	20.4	27.4	16.6	1584.6	22.4	27569	25638	115127	109490
2003	open	0.22	0.22	5817.2	5412.9	356.82	16.3	22.6	20.1	1064.2	23.9	19049	9184	50203	46714
2003	CL1	0.22	0.22	24323.4	23943.4	704.74	34.51	40.3	11.3	5674.9	22.5	116192	7832	33569	33045
2003	CL2-S	0.22	0.22	5905.5	5548.5	330.77	17.85	24.4	18.6	1128.9	21.1	20753	2513	13148	12353
2003	CL2-N	0.22	0.22	8742.9	8386	390.53	22.39	29.2	15.5	1821.9	21.1	34999	3190	15311	14685
2003	NLS	0.22	0.22	4225.3	4128.7	141.65	29.83	36.3	12.5	955.3	5.7	19249	2094	9261	9049
2003	Composite	0.22	0.22	7508.9	7160	252	21	27.9	16.3	1533.7	20.6	29324	24814	121491	115846
2004	open	0.15	0.15	7256.6	6850.4	395.91	18.33	24.6	18.5	921.1	16.4	24656	7949	62625	59119
2004	CL1	0.15	0.15	22475.6	22093.8	659.79	34.06	40.2	11.3	3450.5	15.4	104746	4762	31019	30492
2004	CL2-S	0.15	0.15	7053.5	6694.8	361.81	19.5	25.9	17.5	919.3	14.5	25088	2047	15704	14905
2004	CL2-N	0.15	0.15	9459.8	9101.1	408.35	23.17	29.9	15.2	1312.6	14.5	37288	2299	16566	15938
2004	NLS	0.15	0.15	4097.9	4000.9	138.51	29.59	36.2	12.5	609.6	3.9	18151	1336	8981	8769
2004	Composite	0.15	0.15	8337.4	7986.8	268	21.9	28.6	15.9	1136.8	14.2	32033	18392	134896	129223
2005	open	0.15	0.15	8569	8162.7	426.37	20.1	26.4	17.2	1128.2	16.4	30746	9736	73951	70445
2005	CL1	0.15	0.15	20816.3	20434.4	624.79	33.32	39.7	11.4	3185.5	15.5	97115	4396	28729	28202
2005	CL2-S	0.15	0.15	8097.3	7738.6	385.99	20.98	27.4	16.6	1084.2	14.5	29955	2414	18028	17229
2005	CL2-N	0.15	0.15	10088.1	9729.3	422.24	23.89	30.5	14.9	1413.4	14.5	40388	2475	17666	17038
2005	NLS	0.15	0.15	3980.7	3883.6	136.06	29.26	36	12.6	591	3.9	17641	1295	8724	8512
2005	Composite	0.15	0.15	9091.7	8741	288.1	22.8	29.5	15.4	1255.7	14.2	35567	20317	147099	141426
2006	open	0.15	0.15	9712.3	9306	450.09	21.58	28	16.2	1312.6	16.4	36350	11328	83818	80311
2006	CL1	0.15	0.15	19403	19021.1	597.53	32.47	39	11.6	2954.2	15.5	90104	4077	26778	26251
2006	CL2-S	0.15	0.15	9005.7	8647	404.83	22.25	28.7	15.8	1230.8	14.5	34419	2740	20051	19252
2006	CL2-N	0.15	0.15	10624.9	10266.1	433.06	24.53	31.2	14.6	1500.7	14.5	43108	2628	18606	17978
2006	NLS	0.15	0.15	3880.4	3783.3	134.16	28.92	35.7	12.7	574.5	3.9	17154	1259	8505	8292
2006	Composite	0.15	0.15	9750.4	9399.8	303.8	23.7	30.3	15.0	1361.8	14.2	38801	22033	157757	152085
2007	open	0.15	0.15	10676.6	10270.3	468.56	22.79	29.2	15.5	1470.6	16.4	41276	12692	92140	88634
2007	CL1	0.15	0.15	18235.5	17853.6	576.3	31.64	38.3	11.9	2760.4	15.5	84045	3810	25167	24640
2007	CL2-S	0.15	0.15	9771.8	9413.1	419.49	23.29	29.8	15.2	1356.4	14.5	38336	3020	21756	20957
2007	CL2-N	0.15	0.15	11073.2	10714.5	441.48	25.08	31.7	14.3	1574.4	14.5	45443	2757	19391	18763
2007	NLS	0.15	0.15	3797.7	3700.7	132.67	28.62	35.4	12.8	560.8	3.9	16729	1229	8324	8111
2007	Composite	0.15	0.15	10308	9957.4	316	24.4	31	14.6	1452.9	14.2	41646	23507	166778	161105
2008	open	0.2	0.2	10955.3	10550.4	467.41	23.44	30.1	15.1	2085	21.8	44378	17993	94545	91051
2008	CL1	0.2	0.2	16485.7	16105.2	540.01	30.53	37.5	12.1	3386.2	20.5	77116	4673	22752	22227
2008	CL2-S	0.2	0.2	9934.1	9576.6	416.98	23.82	30.5	14.9	1901	19.3	40670	4232	22117	21321
2008	CL2-N	0.2	0.2	10921	10563.5	433.27	25.21	32	14.2	2128.1	19.3	46273	3727	19125	18499
2008	NLS	0.2	0.2	3559.3	3462.6	127.02	28.02	35	13.0	715.2	5.2	15984	1567	7801	7589
2008	Composite	0.2	0.2	10280.9	9931.5	318.4	24.7	31.5	14.4	1989.7	18.8	43019	32193	166341	160687

Table 13. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 120 full-time days (equal to the 1999 allocation).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvSize	AvESize	AvECnt	Catch	Discard	Eggs	Landings	BM(MT)	xplBM(MT)
1998	open			964.6	658.5	147.3	6.5	12.4	36.6				(MT)	8325	5683
1998	CL1			26699.9	24965.96	1605.6	16.6	19.9	22.8				assumes	36849	34456
1998	CL2-S			3172.5	2832.46	244.8	13	21.4	21.2				40%	7063	6306
1998	CL2-N			3615.1	3191.51	288.3	12.5	24.2	18.8				dredge	6331	5589
1998	NLS			4183.4	3761.78	248.4	16.8	26.9	16.9				eff	9169	8245
1998	Composite			4186.6	3725.6	314.07	13.3	20.8	21.8					67737	60279
1999	open	0.52	0.52	1704.8	1325.2	206.88	8.24	14.2	32.0	510.6	44.8	3909	4407	14713	11437
1999	CL1	0	0	37236.5	36776.7	1556.37	23.93	25.6	17.7	0	0	119298	0	51391	50756
1999	CL2-S	0.6	0.6	3105	2734.1	243.03	12.78	20	22.7	1652.2	56.4	11182	3678	6913	6087
1999	CL2-N	0	0	5599.3	5137.2	358.15	15.63	21.7	20.9	0	0	16915	0	9805	8996
1999	NLS	0	0	5638.2	5479.3	251.08	22.46	25.6	17.7	0	0	19076	0	12357	12009
1999	Composite	0.11	0.14	5882.7	5518.4	219.9	16.8	22.4	20.3	499.7	31.7	18215	8085	95179	89286
2000	open	0.59	0.59	2307.4	1913.5	236.46	9.76	15.8	28.7	961	59.8	6288	8294	19913	16514
2000	CL1	0.2	0.2	37540.5	37159.8	1266.34	29.64	32.1	14.1	7459.9	21.5	150711	10296	51810	51285
2000	CL2-S	0.47	0.47	3380.4	3028.4	252.47	13.39	20.2	22.5	1358.8	45.5	11564	3025	7526	6742
2000	CL2-N	0	0	8039.1	7670.2	421.36	19.08	24.3	18.7	0	0	25651	0	14078	13432
2000	NLS	0.2	0.2	5786.7	5688	215.86	26.81	30.3	15.0	1103.9	6.8	23143	2419	12683	12466
2000	Composite	0.26	0.29	6552.1	6207.8	245.5	19.1	25.5	17.8	1485.5	40.9	23713	24034	106010	100439
2001	open	0.28	0.28	3442.3	3039.8	285.2	12.07	18.1	25.1	693	29.9	9470	5980	29707	26234
2001	CL1	0.28	0.28	32466.8	32088.3	982.16	33.06	36.8	12.3	9723.3	28.4	147869	13419	44808	44286
2001	CL2-S	0.28	0.28	4175.5	3820.1	281.72	14.82	21.4	21.2	960	26.5	13646	2137	9296	8505
2001	CL2-N	0.28	0.28	8263.9	7908.1	397.35	20.8	26.9	16.9	2191	27.1	31885	3837	14472	13849
2001	NLS	0.28	0.28	5167.1	5070.9	177.15	29.17	34	13.4	1510.4	7.3	22911	3310	11325	11114
2001	Composite	0.28	0.28	6774.5	6427.1	241.9	19.8	26.7	17.0	1772.9	25.9	26097	28684	109608	103987
2002	open	0.24	0.24	4653.3	4249.6	324.96	14.32	20.4	22.3	876.6	26	14106	7565	40159	36674
2002	CL1	0.24	0.24	28074.1	27694.6	813.71	34.5	39.4	11.5	7178.4	24.4	131912	9907	38746	38222
2002	CL2-S	0.24	0.24	5048.2	4691.8	308.21	16.38	22.9	19.8	1023.4	22.9	17058	2279	11239	10446
2002	CL2-N	0.24	0.24	8509.7	8153.3	390.51	21.79	28.4	16.0	1932.1	22.9	33538	3383	14902	14278
2002	NLS	0.24	0.24	4655.3	4558.9	155.22	29.99	35.8	12.7	1156.6	6.2	21023	2535	10203	9992
2002	Composite	0.24	0.24	7123.1	6774.7	244.2	20.4	27.4	16.6	1586.5	22.4	27601	25669	115249	109612
2003	open	0.22	0.22	5829.3	5425	357.1	16.32	22.6	20.1	1067.1	23.9	19107	9210	50308	46819
2003	CL1	0.22	0.22	24323.4	23943.4	704.74	34.51	40.3	11.3	5674.9	22.5	116192	7832	33569	33045
2003	CL2-S	0.22	0.22	5905.5	5548.5	330.77	17.85	24.4	18.6	1128.9	21.1	20753	2513	13148	12353
2003	CL2-N	0.22	0.22	8742.9	8386	390.53	22.39	29.2	15.5	1821.9	21.1	34999	3190	15311	14685
2003	NLS	0.22	0.22	4225.3	4128.7	141.65	29.83	36.3	12.5	955.3	5.7	19249	2094	9261	9049
2003	Composite	0.22	0.22	7515.4	7166.5	252.1	21	27.9	16.3	1535.2	20.6	29354	24839	121596	115951
2004	open	0.15	0.15	7267.3	6861	396.13	18.35	24.6	18.5	922.8	16.4	24708	7964	62717	59211
2004	CL1	0.15	0.15	22475.6	22093.8	659.79	34.06	40.2	11.3	3450.5	15.4	104746	4762	31019	30492
2004	CL2-S	0.15	0.15	7053.5	6694.8	361.81	19.5	25.9	17.5	919.3	14.5	25088	2047	15704	14905
2004	CL2-N	0.15	0.15	9459.8	9101.1	408.35	23.17	29.9	15.2	1312.6	14.5	37288	2299	16566	15938
2004	NLS	0.15	0.15	4097.9	4000.9	138.51	29.59	36.2	12.5	609.6	3.9	18151	1336	8981	8769
2004	Composite	0.15	0.15	8343.1	7992.5	268.1	21.9	28.6	15.9	1137.7	14.2	32061	18407	134988	129315
2005	open	0.15	0.15	8578	8171.7	426.54	20.11	26.4	17.2	1129.7	16.4	30791	9749	74029	70523
2005	CL1	0.15	0.15	20816.3	20434.4	624.79	33.32	39.7	11.4	3185.5	15.5	97115	4396	28729	28202
2005	CL2-S	0.15	0.15	8097.3	7738.6	385.99	20.98	27.4	16.6	1084.2	14.5	29955	2414	18028	17229
2005	CL2-N	0.15	0.15	10088.1	9729.3	422.24	23.89	30.5	14.9	1413.4	14.5	40388	2475	17666	17038
2005	NLS	0.15	0.15	3980.7	3883.6	136.06	29.26	36	12.6	591	3.9	17641	1295	8724	8512
2005	Composite	0.15	0.15	9096.5	8745.8	288.2	22.9	29.5	15.4	1256.5	14.2	35591	20330	147176	141503
2006	open	0.15	0.15	9719.7	9313.4	450.22	21.59	28	16.2	1313.9	16.4	36389	11339	83882	80376
2006	CL1	0.15	0.15	19403	19021.1	597.53	32.47	39	11.6	2954.2	15.5	90104	4077	26778	26251
2006	CL2-S	0.15	0.15	9005.7	8647	404.83	22.25	28.7	15.8	1230.8	14.5	34419	2740	20051	19252
2006	CL2-N	0.15	0.15	10624.9	10266.1	433.06	24.53	31.2	14.6	1500.7	14.5	43108	2628	18606	17978
2006	NLS	0.15	0.15	3880.4	3783.3	134.16	28.92	35.7	12.7	574.5	3.9	17154	1259	8505	8292
2006	Composite	0.15	0.15	9754.4	9403.8	303.9	23.7	30.3	15.0	1362.4	14.2	38822	22043	157822	152149
2007	open	0.15	0.15	10682.7	10276.4	468.66	22.79	29.3	15.5	1471.7	16.4	41309	12700	92192	88686
2007	CL1	0.15	0.15	18235.5	17853.6	576.3	31.64	38.3	11.9	2760.4	15.5	84045	3810	25167	24640
2007	CL2-S	0.15	0.15	9771.8	9413.1	419.49	23.29	29.8	15.2	1356.4	14.5	38336	3020	21756	20957
2007	CL2-N	0.15	0.15	11073.2	10714.5	441.48	25.08	31.7	14.3	1574.4	14.5	45443	2757	19391	18763
2007	NLS	0.15	0.15	3797.7	3700.7	132.67	28.62	35.4	12.8	560.8	3.9	16729	1229	8324	8111
2007	Composite	0.15	0.15	10311.2	9960.6	316.1	24.4	31	14.6	1453.4	14.2	41663	23516	166830	161157
2008	open	0.2	0.2	10959.9	10555	467.49	23.44	30.1	15.1	2086	21.8	44404	18002	94585	91091
2008	CL1	0.2	0.2	16485.7	16105.2	540.01	30.53	37.5	12.1	3386.2	20.5	77116	4673	22752	22227
2008	CL2-S	0.2	0.2	9934.1	9576.6	416.98	23.82	30.5	14.9	1901	19.3	40670	4232	22117	21321
2008	CL2-N	0.2	0.2	10921	10563.5	433.27	25.21	32	14.2	2128.1	19.3	46273	3727	19125	18499
2008	NLS	0.2	0.2	3559.3	3462.6	127.02	28.02	35	13.0	715.2	5.2	15984	1567	7801	7589
2008	Composite	0.2	0.2	10283.4	9934	318.4	24.7	31.5	14.4	1990.3	18.8	43033	32202	166380	160727

Table 14. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 51 full-time days (status quo).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvSize	AvESize	AvECnt	Catch	Discard	Eggs	Landings	BM(MT)xplBM(MT)
1998	open			964.6	658.5	147.3	6.5	12.4	36.6				(MT)	8325 5683
1998	CL1			26699.9	24965.96	1605.6	16.6	19.9	22.8				assumes	36849 34456
1998	CL2-S			3172.5	2832.46	244.8	13	21.4	21.2				40%	7063 6306
1998	CL2-N			3615.1	3191.51	288.3	12.5	24.2	18.8				dredge	6331 5589
1998	NLS			4183.4	3761.78	248.4	16.8	26.9	16.9				eff	9169 8245
1998	Composite			4186.6	3725.6	314.07	13.3	20.8	21.8					67737 60279
1999	open	0.52	0.52	1704.8	1325.2	206.88	8.24	14.2	32.0	510.6	44.8	3909	4407	14713 11437
1999	CL1	0	0	37236.5	36776.7	1556.37	23.93	25.6	17.7	0	0	119298	0	51391 50756
1999	CL2-S	0.6	0.6	3105	2734.1	243.03	12.78	20	22.7	1652.2	56.4	11182	3678	6913 6087
1999	CL2-N	0	0	5599.3	5137.2	358.15	15.63	21.7	20.9	0	0	16915	0	9805 8996
1999	NLS	0	0	5638.2	5479.3	251.08	22.46	25.6	17.7	0	0	19076	0	12357 12009
1999	Composite	0.11	0.14	5882.7	5518.4	219.9	16.8	22.4	20.3	499.7	31.7	18215	8085	95179 89286
2000	open	0.41	0.41	2604.4	2206	252.05	10.33	16.3	27.9	724	42.3	6770	6248	22476 19038
2000	CL1	0.2	0.2	37540.5	37159.8	1266.34	29.64	32.1	14.1	7459.9	21.5	150711	10296	51810 51285
2000	CL2-S	0.47	0.47	3380.4	3028.4	252.47	13.39	20.2	22.5	1358.8	45.5	11564	3025	7526 6742
2000	CL2-N	0	0	8039.1	7670.2	421.36	19.08	24.3	18.7	0	0	25651	0	14078 13432
2000	NLS	0.2	0.2	5786.7	5688	215.86	26.81	30.3	15.0	1103.9	6.8	23143	2419	12683 12466
2000	Composite	0.23	0.25	6710.5	6363.8	249.6	19.1	25.3	17.9	1359	31.6	23969	21988	108573 102963
2001	open	0.28	0.28	3742.5	3339.9	295.89	12.65	18.7	24.3	777.5	30.1	10605	6710	32298 28824
2001	CL1	0.28	0.28	32466.8	32088.3	982.16	33.06	36.8	12.3	9723.3	28.4	147869	13419	44808 44286
2001	CL2-S	0.28	0.28	4175.5	3820.1	281.72	14.82	21.4	21.2	960	26.5	13646	2137	9296 8505
2001	CL2-N	0.28	0.28	8263.9	7908.1	397.35	20.8	26.9	16.9	2191	27.1	31885	3837	14472 13849
2001	NLS	0.28	0.28	5167.1	5070.9	177.15	29.17	34	13.4	1510.4	7.3	22911	3310	11325 11114
2001	Composite	0.28	0.28	6934.6	6587.2	248.7	20	26.7	17.0	1818	26	26702	29414	112199 106577
2002	open	0.24	0.24	4928.8	4525.1	332.57	14.82	21	21.6	946.3	26	15292	8166	42536 39052
2002	CL1	0.24	0.24	28074.1	27694.6	813.71	34.5	39.4	11.5	7178.4	24.4	131912	9907	38746 38222
2002	CL2-S	0.24	0.24	5048.2	4691.8	308.21	16.38	22.9	19.8	1023.4	22.9	17058	2279	11239 10446
2002	CL2-N	0.24	0.24	8509.7	8153.3	390.51	21.79	28.4	16.0	1932.1	22.9	33538	3383	14902 14278
2002	NLS	0.24	0.24	4655.3	4558.9	155.22	29.99	35.8	12.7	1156.6	6.2	21023	2535	10203 9992
2002	Composite	0.24	0.24	7270.1	6921.7	249.1	20.6	27.5	16.5	1623.7	22.4	28234	26270	117626 111989
2003	open	0.22	0.22	6066.5	5662.2	362.63	16.73	23.1	19.7	1123.8	23.9	20223	9698	52355 48866
2003	CL1	0.22	0.22	24323.4	23943.4	704.74	34.51	40.3	11.3	5674.9	22.5	116192	7832	33569 33045
2003	CL2-S	0.22	0.22	5905.5	5548.5	330.77	17.85	24.4	18.6	1128.9	21.1	20753	2513	13148 12353
2003	CL2-N	0.22	0.22	8742.9	8386	390.53	22.39	29.2	15.5	1821.9	21.1	34999	3190	15311 14685
2003	NLS	0.22	0.22	4225.3	4128.7	141.65	29.83	36.3	12.5	955.3	5.7	19249	2094	9261 9049
2003	Composite	0.22	0.22	7641.9	7293	255.6	21.2	28.1	16.2	1565.4	20.6	29950	25328	123643 117998
2004	open	0.15	0.15	7474.8	7068.6	400.44	18.67	25	18.2	956.2	16.4	25716	8252	64509 61003
2004	CL1	0.15	0.15	22475.6	22093.8	659.79	34.06	40.2	11.3	3450.5	15.4	104746	4762	31019 30492
2004	CL2-S	0.15	0.15	7053.5	6694.8	361.81	19.5	25.9	17.5	919.3	14.5	25088	2047	15704 14905
2004	CL2-N	0.15	0.15	9459.8	9101.1	408.35	23.17	29.9	15.2	1312.6	14.5	37288	2299	16566 15938
2004	NLS	0.15	0.15	4097.9	4000.9	138.51	29.59	36.2	12.5	609.6	3.9	18151	1336	8981 8769
2004	Composite	0.15	0.15	8453.8	8103.2	270.7	22.1	28.8	15.8	1155.5	14.2	32599	18696	136779 131107
2005	open	0.15	0.15	8753.3	8347	429.89	20.36	26.7	17.0	1158.4	16.4	31683	9997	75542 72035
2005	CL1	0.15	0.15	20816.3	20434.4	624.79	33.32	39.7	11.4	3185.5	15.5	97115	4396	28729 28202
2005	CL2-S	0.15	0.15	8097.3	7738.6	385.99	20.98	27.4	16.6	1084.2	14.5	29955	2414	18028 17229
2005	CL2-N	0.15	0.15	10088.1	9729.3	422.24	23.89	30.5	14.9	1413.4	14.5	40388	2475	17666 17038
2005	NLS	0.15	0.15	3980.7	3883.6	136.06	29.26	36	12.6	591	3.9	17641	1295	8724 8512
2005	Composite	0.15	0.15	9190	8839.3	290.2	23	29.6	15.3	1271.8	14.2	36067	20577	148689 143016
2006	open	0.15	0.15	9864.2	9458	452.83	21.78	28.2	16.1	1337.8	16.4	37149	11545	85129 81623
2006	CL1	0.15	0.15	19403	19021.1	597.53	32.47	39	11.6	2954.2	15.5	90104	4077	26778 26251
2006	CL2-S	0.15	0.15	9005.7	8647	404.83	22.25	28.7	15.8	1230.8	14.5	34419	2740	20051 19252
2006	CL2-N	0.15	0.15	10624.9	10266.1	433.06	24.53	31.2	14.6	1500.7	14.5	43108	2628	18606 17978
2006	NLS	0.15	0.15	3880.4	3783.3	134.16	28.92	35.7	12.7	574.5	3.9	17154	1259	8505 8292
2006	Composite	0.15	0.15	9831.5	9480.9	305.5	23.8	30.4	14.9	1375.2	14.2	39227	22250	159069 153396
2007	open	0.15	0.15	10799.9	10393.6	470.69	22.94	29.4	15.4	1491.2	16.4	41940	12869	93204 89698
2007	CL1	0.15	0.15	18235.5	17853.6	576.3	31.64	38.3	11.9	2760.4	15.5	84045	3810	25167 24640
2007	CL2-S	0.15	0.15	9771.8	9413.1	419.49	23.29	29.8	15.2	1356.4	14.5	38336	3020	21756 20957
2007	CL2-N	0.15	0.15	11073.2	10714.5	441.48	25.08	31.7	14.3	1574.4	14.5	45443	2757	19391 18763
2007	NLS	0.15	0.15	3797.7	3700.7	132.67	28.62	35.4	12.8	560.8	3.9	16729	1229	8324 8111
2007	Composite	0.15	0.15	10373.8	10023.1	317.3	24.5	31.1	14.6	1463.9	14.2	42000	23685	167843 162170
2008	open	0.2	0.2	11049.4	10644.5	468.99	23.56	30.3	15.0	2106.5	21.8	44907	18180	95358 91863
2008	CL1	0.2	0.2	16485.7	16105.2	540.01	30.53	37.5	12.1	3386.2	20.5	77116	4673	22752 22227
2008	CL2-S	0.2	0.2	9934.1	9576.6	416.98	23.82	30.5	14.9	1901	19.3	40670	4232	22117 21321
2008	CL2-N	0.2	0.2	10921	10563.5	433.27	25.21	32	14.2	2128.1	19.3	46273	3727	19125 18499
2008	NLS	0.2	0.2	3559.3	3462.6	127.02	28.02	35	13.0	715.2	5.2	15984	1567	7801 7589
2008	Composite	0.2	0.2	10331.1	9981.7	319.4	24.7	31.5	14.4	2001.3	18.8	43301	32380	167153 161499

6.2.6.2.2 Mid-Atlantic

Accounting for the projected day-at-sea use for each option and for the proportion of biomass in the closed areas, the catch for 2000 is expected to be 26.3 to 28.5 percent higher than status quo for full-time day-at-sea allocations of 120 and 142 days, respectively (Table 11). Total biomass at the end of the year and catch in the following year (2001) is projected to be about 5 percent less than the status quo alternative (51 days), which in turn gives a biomass estimate that is 4.9 to 5.3 percent less than the status quo at the end of 2001. The projection indicates that the plan would achieve the rebuilding objective in 2003 (year 6) for Alternatives 1 and 2, although there are marginal differences in the biomass expected in that year (Table 16 and Table 17), assuming median recruitment in 2000 to 2003. The status quo is projected to achieve the biomass target in 2002, one year earlier than either Alternatives 1 and 2 (Table 18).

These projections for the Mid-Atlantic assume that fishing mortality in the open area during 2000 is consistent with that predicted by the analysis in Section 6.2.6.1. It also assumes that there are no catches in the two scallop closed areas during 2000. In 2001, the projections assume that all areas are open to fishing and the Amendment 7 fishing mortality objective (0.28) is achieved in all areas. This assumption may overestimate catch in 2001 if the policy concerning access to the groundfish closed areas is applied to the Mid-Atlantic closed areas in 2001. Since this policy has not been determined yet, the projections assume that the Amendment 7 fishing mortality rates and strategies (i.e. all areas open to fishing) apply.

Table 15. Summary of Mid-Atlantic projections for 2000 and 2001 calendar years.

Option	Change vs. status quo in 2000		Rebuilding projected to be achieved by:	Change vs. status quo in 2001	
	Catch	End of year biomass		Catch	End of year biomass
142 DAS	28.5%	-5.3%	2003	-5.3%	-4.9%
120 DAS	26.3%	-4.8%	2003	-4.9%	-4.5%
51 DAS	0.0%	0.0%	2002	0.0%	0.0%

Table 16. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 142 full-time days (equal to the 1998 allocation).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvgSize	AvgESize	AvgECnt	Fishing	Discard	Eggs	Harv(MT)	BM(MT)	xplBM(MT)
1998	Open			865.4	591.13	120.8	7.2	11.7	38.8					12710	8682
1998	VirBeach			4353.3	3995.95	360.6	12.1	14.5	31.3					1820	1671
1998	HudCan			4490.3	3168.3	607.5	7.4	11.2	40.5					14282	10077
1998	Composite			1575.6	1117.2	210.94	7.5	12.7	35.7					28813	20431
1999	Open	0.87	0.87	1024.9	880.2	101.52	10.1	15.3	29.7	682.1	56	2861	10019	15053	12928
1999	VirBeach	0	0	7446.4	7230.1	388.53	19.17	22.4	20.3	0	0	18956	0	3113	3023
1999	HudCan	0	0	9434.6	9029.9	619.08	15.24	17.4	26.1	0	0	20712	0	30009	28722
1999	Composite	0.33	0.32	2634.5	2442.9	128.9	13.3	17	26.7	547.9	45	6334	10019	48176	44672
2000	Open	1.01	1.01	885.9	750.3	85.71	10.34	17.4	26.1	827.1	37.2	2973	12148	13012	11021
2000	VirBeach	0	0	10404	10184.9	413.81	25.14	29.3	15.5	0	0	31442	0	4350	4258
2000	HudCan	0	0	14460	14209.7	629.55	22.97	25.6	17.7	0	0	40253	0	45993	45197
2000	Composite	0.24	0.28	3464.5	3307.1	141.7	18.4	23.8	19.1	664.3	29.8	10108	12148	63355	60476
2001	Open	0.28	0.28	1318.3	1176.4	104.67	12.6	19.3	23.5	268.9	10.7	3532	3949	19364	17279
2001	VirBeach	0.28	0.28	9958.3	9743.1	352.83	28.22	34	13.4	2807	16.7	37908	1174	4163	4074
2001	HudCan	0.28	0.28	14350.3	14110.4	508.41	28.23	32.5	14.0	4003.9	18.8	52567	12735	45644	44881
2001	Composite	0.28	0.28	3782.6	3622	134.7	20.9	27.6	16.4	976.5	12.3	12847	17858	69172	66234
2002	Open	0.24	0.24	1798.7	1656.3	120.02	14.99	21.7	20.9	340.3	9.4	5195	4999	26420	24327
2002	VirBeach	0.24	0.24	9435.6	9219.9	320.04	29.48	36.3	12.5	2281.9	14.3	37086	954	3945	3855
2002	HudCan	0.24	0.24	13653	13412.6	438.68	31.12	36.8	12.3	3319	15.9	53192	10557	43426	42662
2002	Composite	0.24	0.24	4035.2	3874.1	130.9	22.4	29.7	15.3	902.8	10.7	14273	16509	73791	70843
2003	Open	0.22	0.22	2277.6	2134.9	132.36	17.21	24.1	18.8	418	8.7	7026	6140	33453	31357
2003	VirBeach	0.22	0.22	8924.1	8708.1	300.83	29.66	37.1	12.2	1973.9	13.1	35601	825	3731	3641
2003	HudCan	0.22	0.22	12717.4	12476.6	394.84	32.21	38.9	11.7	2853.7	14.6	51258	9077	40450	39685
2003	Composite	0.22	0.22	4245.4	4084	131.5	23.3	30.8	14.7	877.2	9.8	15373	16042	77634	74682
2004	Open	0.15	0.15	2867.4	2724	147.12	19.49	26.4	17.2	364.8	6	9104	5359	42116	40010
2004	VirBeach	0.15	0.15	8966.7	8749.6	300.97	29.79	37.3	12.2	1310	9	34931	548	3749	3658
2004	HudCan	0.15	0.15	12454.6	12212.6	381.82	32.62	39.7	11.4	1853.7	10.1	49564	5896	39615	38845
2004	Composite	0.15	0.15	4674.4	4512.2	137.3	24.4	31.8	14.3	645.4	6.7	16732	11803	85479	82513
2005	Open	0.15	0.15	3411.8	3268.4	158.63	21.51	28.5	15.9	450.3	6	11374	6613	50112	48006
2005	VirBeach	0.15	0.15	8980.9	8763.8	301.08	29.83	37.3	12.2	1313.6	9	35149	549	3755	3664
2005	HudCan	0.15	0.15	12106.5	11864.5	371.7	32.57	39.8	11.4	1806.2	10.1	48658	5745	38508	37738
2005	Composite	0.15	0.15	5051.5	4889.2	145.8	25.4	32.7	13.9	705.8	6.8	18403	12908	92375	89407
2006	Open	0.15	0.15	3890.3	3746.9	167.59	23.21	30.3	15.0	527.1	6	13473	7742	57140	55034
2006	VirBeach	0.15	0.15	8986.6	8769.5	301.16	29.84	37.3	12.2	1314.7	9	35235	550	3757	3666
2006	HudCan	0.15	0.15	11755.1	11513.1	363.81	32.31	39.7	11.4	1752.7	10.1	47385	5575	37390	36620
2006	Composite	0.15	0.15	5374.8	5212.5	152.4	26.2	33.6	13.5	758.3	6.8	19869	13867	98287	95320
2007	Open	0.15	0.15	4296.5	4153	174.56	24.61	31.8	14.3	593.5	6	15323	8717	63106	60999
2007	VirBeach	0.15	0.15	8990.6	8773.4	301.23	29.85	37.4	12.1	1315.2	9	35277	550	3759	3668
2007	HudCan	0.15	0.15	11437	11195	357.66	31.98	39.5	11.5	1701.9	10.1	46071	5413	36378	35608
2007	Composite	0.15	0.15	5645.8	5483.5	157.5	27	34.3	13.2	802.8	6.8	21127	14680	103243	100275
2008	Open	0.2	0.2	4422.7	4279.8	174.21	25.39	32.8	13.8	844.5	7.9	16495	12404	64960	62861
2008	VirBeach	0.2	0.2	8579.4	8363.1	291.11	29.47	37.2	12.2	1712	12	34464	716	3587	3497
2008	HudCan	0.2	0.2	10646.5	10405.3	340.72	31.25	39	11.6	2156.6	13.4	43800	6860	33863	33096
2008	Composite	0.2	0.2	5600.3	5438.6	158	27.2	34.8	13.0	1092.6	9	21655	19979	102410	99453

Table 17. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 120 full-time days (equal to the 1999 allocation).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvgSize	AvgESize	AvgECnt	Fishing	Discard	Eggs	Harv(MT)	BM(MT)	xplBM(MT)
1998	Open			865.4	591.13	120.8	7.2	11.7	38.8					12710	8682
1998	VirBeach			4353.3	3995.95	360.6	12.1	14.5	31.3					1820	1671
1998	HudCan			4490.3	3168.3	607.5	7.4	11.2	40.5					14282	10077
1998	Composite			1575.6	1117.2	210.94	7.5	12.7	35.7				28813	20431	20431
1999	Open	0.87	0.87	1024.9	880.2	101.52	10.1	15.3	29.7	682.1	56	2861	10019	15053	12928
1999	VirBeach	0	0	7446.4	7230.1	388.53	19.17	22.4	20.3	0	0	18956	0	3113	3023
1999	HudCan	0	0	9434.6	9029.9	619.08	15.24	17.4	26.1	0	0	20712	0	30009	28722
1999	Composite	0.33	0.32	2634.5	2442.9	128.9	13.3	17	26.7	547.9	45	6334	10019	48176	44672
2000	Open	0.98	0.98	904.8	769	86.61	10.45	17.5	25.9	812.9	36.1	3008	11939	13290	11295
2000	VirBeach	0	0	10404	10184.9	413.81	25.14	29.3	15.5	0	0	31442	0	4350	4258
2000	HudCan	0	0	14460	14209.7	629.55	22.97	25.6	17.7	0	0	40253	0	45993	45197
2000	Composite	0.24	0.28	3479.7	3322.1	142.1	18.5	23.8	19.1	652.9	29	10137	11939	63633	60750
2001	Open	0.28	0.28	1337.6	1195.6	105.29	12.7	19.4	23.4	274.3	10.7	3601	4028	19646	17561
2001	VirBeach	0.28	0.28	9958.3	9743.1	352.83	28.22	34	13.4	2807	16.7	37908	1174	4163	4074
2001	HudCan	0.28	0.28	14350.3	14110.4	508.41	28.23	32.5	14.0	4003.9	18.8	52567	12735	45644	44881
2001	Composite	0.28	0.28	3798.1	3637.4	135.3	21	27.6	16.4	980.9	12.3	12902	17937	69454	66516
2002	Open	0.24	0.24	1816.5	1674	120.45	15.08	21.8	20.8	344.8	9.4	5266	5064	26680	24587
2002	VirBeach	0.24	0.24	9435.6	9219.9	320.04	29.48	36.3	12.5	2281.9	14.3	37086	954	3945	3855
2002	HudCan	0.24	0.24	13653	13412.6	438.68	31.12	36.8	12.3	3319	15.9	53192	10557	43426	42662
2002	Composite	0.24	0.24	4049.5	3888.3	131.3	22.5	29.7	15.3	906.4	10.7	14329	16575	74052	71104
2003	Open	0.22	0.22	2292.9	2150.2	132.67	17.28	24.2	18.8	421.7	8.7	7092	6193	33678	31582
2003	VirBeach	0.22	0.22	8924.1	8708.1	300.83	29.66	37.1	12.2	1973.9	13.1	35601	825	3731	3641
2003	HudCan	0.22	0.22	12717.4	12476.6	394.84	32.21	38.9	11.7	2853.7	14.6	51258	9077	40450	39685
2003	Composite	0.22	0.22	4257.7	4096.3	131.8	23.4	30.9	14.7	880.2	9.8	15426	16095	77859	74907
2004	Open	0.15	0.15	2880.9	2737.4	147.37	19.55	26.4	17.2	367	6	9163	5391	42314	40207
2004	VirBeach	0.15	0.15	8966.7	8749.6	300.97	29.79	37.3	12.2	1310	9	34931	548	3749	3658
2004	HudCan	0.15	0.15	12454.6	12212.6	381.82	32.62	39.7	11.4	1853.7	10.1	49564	5896	39615	38845
2004	Composite	0.15	0.15	4685.2	4523	137.5	24.4	31.8	14.3	647.2	6.7	16779	11835	85677	82710
2005	Open	0.15	0.15	3423.2	3279.8	158.82	21.55	28.5	15.9	452.1	6	11426	6641	50279	48173
2005	VirBeach	0.15	0.15	8980.9	8763.8	301.08	29.83	37.3	12.2	1313.6	9	35149	549	3755	3664
2005	HudCan	0.15	0.15	12106.5	11864.5	371.7	32.57	39.8	11.4	1806.2	10.1	48658	5745	38508	37738
2005	Composite	0.15	0.15	5060.6	4898.4	145.9	25.4	32.8	13.8	707.3	6.8	18445	12935	92542	89575
2006	Open	0.15	0.15	3899.7	3756.3	167.74	23.25	30.3	15.0	528.7	6	13517	7765	57278	55172
2006	VirBeach	0.15	0.15	8986.6	8769.5	301.16	29.84	37.3	12.2	1314.7	9	35235	550	3757	3666
2006	HudCan	0.15	0.15	11755.1	11513.1	363.81	32.31	39.7	11.4	1752.7	10.1	47385	5575	37390	36620
2006	Composite	0.15	0.15	5382.4	5220.1	152.5	26.3	33.6	13.5	759.6	6.8	19905	13890	98425	95458
2007	Open	0.15	0.15	4304.1	4160.7	174.68	24.64	31.8	14.3	594.7	6	15359	8736	63218	61112
2007	VirBeach	0.15	0.15	8990.6	8773.4	301.23	29.85	37.4	12.1	1315.2	9	35277	550	3759	3668
2007	HudCan	0.15	0.15	11437	11195	357.66	31.98	39.5	11.5	1701.9	10.1	46071	5413	36378	35608
2007	Composite	0.15	0.15	5651.9	5489.7	157.7	27	34.3	13.2	803.8	6.8	21157	14699	103355	100388
2008	Open	0.2	0.2	4428.5	4285.6	174.3	25.41	32.8	13.8	845.8	7.9	16524	12423	65045	62946
2008	VirBeach	0.2	0.2	8579.4	8363.1	291.11	29.47	37.2	12.2	1712	12	34464	716	3587	3497
2008	HudCan	0.2	0.2	10646.5	10405.3	340.72	31.25	39	11.6	2156.6	13.4	43800	6860	33863	33096
2008	Composite	0.2	0.2	5604.9	5443.3	158.1	27.2	34.8	13.0	1093.6	9	21678	19999	102496	99539

Table 18. Ten-year projections of total biomass, exploitable biomass, and catch for day-at-sea allocations equivalent to 51 full-time days (status quo).

Year	Reg	F(bm)	F(n)	Biomass	ExplBms	Numbers	AvgSize	AvgESize	AvgECnt	Fishing	Discard	Eggs	Harv(MT)	BM(MT)	xplBM(MT)
1998	Open			865.4	591.13	120.8	7.2	11.7	38.8				assumes	12710	8682
1998	VirBeach			4353.3	3995.95	360.6	12.1	14.5	31.3				40%	1820	1671
1998	HudCan			4490.3	3168.3	607.5	7.4	11.2	40.5				dredge	14282	10077
1998	Composite			1575.6	1117.2	210.94	7.5	12.7	35.7				eff	28813	20431
1999	Open	0.87	0.87	1024.9	880.2	101.52	10.1	15.3	29.7	682.1	56	2861	10019	15053	12928
1999	VirBeach	0	0	7446.4	7230.1	388.53	19.17	22.4	20.3	0	0	18956	0	3113	3023
1999	HudCan	0	0	9434.6	9029.9	619.08	15.24	17.4	26.1	0	0	20712	0	30009	28722
1999	Composite	0.33	0.32	2634.5	2442.9	128.9	13.3	17	26.7	547.9	45	6334	10019	48176	44672
2000	Open	0.68	0.68	1125.6	987.2	96.95	11.61	18.3	24.8	643.5	25.8	3401	9452	16532	14500
2000	VirBeach	0	0	10404	10184.9	413.81	25.14	29.3	15.5	0	0	31442	0	4350	4258
2000	HudCan	0	0	14460	14209.7	629.55	22.97	25.6	17.7	0	0	40253	0	45993	45197
2000	Composite	0.18	0.21	3657	3497.4	146.8	18.6	23.7	19.2	516.9	20.7	10452	9452	66875	63955
2001	Open	0.28	0.28	1560.7	1418.6	112.38	13.89	20.6	22.0	337.1	10.8	4399	4952	22923	20837
2001	VirBeach	0.28	0.28	9958.3	9743.1	352.83	28.22	34	13.4	2807	16.7	37908	1174	4163	4074
2001	HudCan	0.28	0.28	14350.3	14110.4	508.41	28.23	32.5	14.0	4003.9	18.8	52567	12735	45644	44881
2001	Composite	0.28	0.28	3977.2	3816.5	142.2	21.3	27.8	16.3	1031.4	12.4	13543	18860	72730	69792
2002	Open	0.24	0.24	2021.6	1879.1	125.51	16.11	23	19.7	396.6	9.4	6083	5825	29692	27600
2002	VirBeach	0.24	0.24	9435.6	9219.9	320.04	29.48	36.3	12.5	2281.9	14.3	37086	954	3945	3855
2002	HudCan	0.24	0.24	13653	13412.6	438.68	31.12	36.8	12.3	3319	15.9	53192	10557	43426	42662
2002	Composite	0.24	0.24	4214.2	4053	136.1	22.9	30	15.1	948	10.7	14986	17336	77064	74116
2003	Open	0.22	0.22	2469.9	2327.2	136.34	18.12	25.1	18.1	463.9	8.7	7852	6813	36277	34181
2003	VirBeach	0.22	0.22	8924.1	8708.1	300.83	29.66	37.1	12.2	1973.9	13.1	35601	825	3731	3641
2003	HudCan	0.22	0.22	12717.4	12476.6	394.84	32.21	38.9	11.7	2853.7	14.6	51258	9077	40450	39685
2003	Composite	0.22	0.22	4399.8	4238.4	135.3	23.8	31.3	14.5	914.1	9.8	16036	16715	80458	77506
2004	Open	0.15	0.15	3036	2892.6	150.23	20.21	27.2	16.7	392	6	9844	5757	44592	42486
2004	VirBeach	0.15	0.15	8966.7	8749.6	300.97	29.79	37.3	12.2	1310	9	34931	548	3749	3658
2004	HudCan	0.15	0.15	12454.6	12212.6	381.82	32.62	39.7	11.4	1853.7	10.1	49564	5896	39615	38845
2004	Composite	0.15	0.15	4809.8	4647.6	140.1	24.8	32.2	14.1	667.2	6.7	17326	12201	87956	84989
2005	Open	0.15	0.15	3554.4	3411	161.04	22.07	29.1	15.6	473.6	6	12025	6956	52207	50100
2005	VirBeach	0.15	0.15	8980.9	8763.8	301.08	29.83	37.3	12.2	1313.6	9	35149	549	3755	3664
2005	HudCan	0.15	0.15	12106.5	11864.5	371.7	32.57	39.8	11.4	1806.2	10.1	48658	5745	38508	37738
2005	Composite	0.15	0.15	5166	5003.7	148	25.7	33.1	13.7	724.6	6.8	18926	13250	94469	91502
2006	Open	0.15	0.15	4008	3864.6	169.47	23.65	30.8	14.7	546.6	6	14026	8029	58869	56763
2006	VirBeach	0.15	0.15	8986.6	8769.5	301.16	29.84	37.3	12.2	1314.7	9	35235	550	3757	3666
2006	HudCan	0.15	0.15	11755.1	11513.1	363.81	32.31	39.7	11.4	1752.7	10.1	47385	5575	37390	36620
2006	Composite	0.15	0.15	5469.3	5307.1	154.1	26.5	33.9	13.4	774	6.8	20313	14153	100016	97049
2007	Open	0.15	0.15	4392.1	4248.6	176.03	24.95	32.1	14.1	609.4	6	15781	8951	64510	62404
2007	VirBeach	0.15	0.15	8990.6	8773.4	301.23	29.85	37.4	12.1	1315.2	9	35277	550	3759	3668
2007	HudCan	0.15	0.15	11437	11195	357.66	31.98	39.5	11.5	1701.9	10.1	46071	5413	36378	35608
2007	Composite	0.15	0.15	5722.6	5560.3	158.9	27.2	34.6	13.1	815.6	6.8	21495	14914	104647	101680
2008	Open	0.2	0.2	4495.7	4352.8	175.3	25.65	33.1	13.7	861.2	7.9	16859	12650	66032	63933
2008	VirBeach	0.2	0.2	8579.4	8363.1	291.11	29.47	37.2	12.2	1712	12	34464	716	3587	3497
2008	HudCan	0.2	0.2	10646.5	10405.3	340.72	31.25	39	11.6	2156.6	13.4	43800	6860	33863	33096
2008	Composite	0.2	0.2	5658.9	5497.2	159	27.4	35	13.0	1106	9	21947	20225	103483	100526

6.2.6.3 Impacts on Habitat

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920 of the EFH Interim Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

- A. Description of the proposed action -- See Section 5.0 for a description of the proposed action. The activity described by this proposed action, fishing for sea scallops, occurs throughout the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment #9 to the Atlantic Sea Scallop FMP).
- B. Analysis of the effects of the proposed action -- Although scallop dredges has been shown to be associated with adverse impacts to some types of bottom habitat (see Section 4.0 of Amendment #9 to the Atlantic Sea Scallop FMP), this action does not propose to increase or decrease current levels of fishing activity in the U.S. EEZ. This action maintains the current days-at-sea allocations for all sectors of the sea scallop fishery. Since the DAS allocations will not change from the 1999 fishing year to the 2000 fishing year, no changes to the level or distribution of fishing effort are expected. This action will not have any adverse impacts on the EFH of any managed species relative to the baseline conditions established under Amendment #9.
- C. Conclusions -- The action proposed under this framework has no potential adverse effects on the EFH of any species managed by the New England, Mid-Atlantic or South Atlantic Fishery Management Councils. Because there are no potential adverse impacts associated with this action, no EFH consultation is required.
- D. Proposed mitigation -- None required.

6.2.6.4 Impacts on Endangered Species and Other Marine Mammal

A description of potentially affected protected species (marine mammals, sea turtles and shortnose sturgeon, including those that are threatened and endangered or proposed to be listed as threatened or endangered) was provided in Amendment 4 to the Atlantic Sea Scallop FMP and in the associated NMFS Biological Opinion. Impacts of the fishery and management measures were most recently reviewed in Amendment 7 and Framework Adjustment 11 to the FMP. Prior to those actions, they were discussed in the Environmental Assessment associated with the NMFS Interim Action to Implement Sea Scallop Protection Measures in the Atlantic Sea Scallop Fishery, dated February 1998.

Detailed information may be found in stock assessment reports prepared by NMFS pursuant to Section 117 of the Marine Mammal Protection Act (MMPA) for all marine mammal species in the U.S. Atlantic Ocean and in the Gulf of Mexico. The initial stock assessments were presented in Blaylock, *et. al.* (1995) and are updated in Waring, *et al.* (1997). The most recent report, *U.S. Atlantic Marine Mammal Stock Assessments -- 1998* (Waring *et.al.* 1999), contains only assessment reports for the Atlantic stocks. Information presented includes stock definition and geographic range, population size and productivity rates and known impacts. Information on sea turtle status is contained in the 1995 and 1997 status reviews of listed turtles prepared jointly by NMFS and the U.S. Fish and Wildlife Service (NMFS and USFWS, 1995).

6.2.6.4.1 Affected Species

Right Whales and Critical Habitat - The right whale population, which numbers less than 300 animals ranges from wintering and calving grounds in the southeastern U.S. to summer feeding grounds in New England, the northern Bay of Fundy and the Scotian Shelf. New England waters are a primary feeding ground. Principal prey items include copepods in the genera *Calanus* and *Pseudocalanus*, although they may feed on similar-sized zooplankton and other organisms. Feeding efficiency may depend on the ability of whales to find and exploit dense zooplankton patches. Areas of the Great South Channel and Cape Cod Bay have been identified as right whale critical habitat. Despite exposure to the presence of mobile gear region-wide, including scallop dredge gear, encounters or serious injury to right whales are rare and generally associated with fixed gear. Given the remote likelihood of right whale interactions with scallop dredge gear, the measures contained in this framework adjustment may be affect, but are not likely to pose a major threat to this species. Similarly, neither the framework adjustment measures nor the fishery itself should affect or modify the measures contained in the Atlantic Large Whale Take Reduction Plan (ALWTRP) or right whale critical habitat.

Harbor Porpoise - As with right whales and most other cetacean species, harbor porpoise are also unlikely to interact with dredge gear because of its configuration and the behavior of the animals. Harbor porpoise are the subject of a Take Reduction Plan implemented by NMFS in December 1998 and are most vulnerable to entanglement in fixed gear. During any given season porpoise may be found on Georges Bank, but are generally more abundant in the western Gulf of Maine and move northward to the Bay of Fundy in the summer.

Sea Turtles - Loggerhead, leatherback and Kemp's ridley turtles are known to inhabit the action area and are susceptible to entanglement in gear used in the sea scallop fishery. Given the available information, however, there is no reason to conclude that the fishery or the proposed action represents a major source of human-induced serious injury or mortality.

Shortnose Sturgeon - Although shortnose sturgeon have the potential to interact with scallop dredge gear, the possibility is remote given that they are benthic fish that mainly occupy the deep channel sections of large rivers.

Barndoor Skate - On March 30, 1999, the Center for Marine Conservation petitioned the Secretary of Commerce to list the barndoor skate as an endangered species. Acting on behalf of the Secretary, NMFS will determine if the petition is warranted, and if so, will conduct a status review. The agency will make a decision to list or not, based on their finding. This issue is relevant to the Council because a relatively large number of barndoor skates (148) were taken as bycatch in the summer, 1998 cooperative NMFS/industry survey undertaken to determine sea scallop abundance in Closed Area II. (In a 1999 joint NMFS/industry dredge survey, 61 barndoor skates were taken in 132 ten-minute tows in the Nantucket Lightship Area and 114 were taken in 188 ten-minute tows in Closed Area I). The 1998 information provoked attention because this species of skate was once abundant in the central portion of its range, including Georges Bank and Nantucket Shoals, but has demonstrated a distinct decline over the last 30 years according to historic survey information provided by the Northeast Fisheries Science Center. The most recent surveys indicate a possible increase in barndoor skates in the southern portion of Georges Bank, a possible result of the year-round closure of Area II since 1994. Despite the encouraging news, scientists at a recent workshop held to discuss the status and conservation needs of the barndoor skate concluded that the population has decreased by 90-99 percent. Participants further stated that barndoor skates continue to persist in substantial numbers only on Georges and Browns Bank and in deeper waters off the Newfoundland Grand Banks.

6.2.6.4.2 Impacts of Management Measures

This action adjusts the days-at-sea allocations for limited access scallop vessels during the 2000 fishing year, to be consistent with the fishing mortality target approved in Amendment 7 to the Sea Scallop Fishery Management Plan. The Council approved Alternative 2, described earlier in this document (120 days-at-sea for full-time vessels, 48 days for part-time vessels and 10 days for vessels in the occasional category). Effort calculated under this scenario is not expected to change from 1998-1999 levels. Therefore, few changes in impacts to endangered and protected species are expected and fall under the scope of recent consultations conducted for this FMP.

Based on the historic low level of documented takes in this fishery, NMFS concluded previously that similar action was not likely to jeopardize the continued existence of any threatened and endangered species. The management measures proposed in this framework adjustment and the alternatives considered should not alter this conclusion.

6.2.7 Economic Impacts of the Proposed Action

6.2.7.1 Introduction

Framework 12 proposes to adjust the day-at-sea allocations for limited access scallop vessels during the 2000 fishing year to be consistent with the fishing mortality target approved in Amendment 7. The proposed adjustment will have positive impacts on the economic viability of the scallop vessels and on the net national economic benefits derived from the scallop industry.

The economic impacts of the DAS options are analyzed assuming that there will be no access to the closed areas. The analyses corresponding to these options provide an assessment of the economic impacts both on individual vessel operations, and on the economic costs and benefits to the nation. The analysis examines three management scenarios with 51, 120 and 142 DAS.

- A. Status quo management: Implementation of Amendment 7 DAS schedule with 51 DAS for full-time vessels (20 for part-time and 4 DAS for occasional vessels).
- B. Proposed adjustment to 120 DAS: Continuation of the 1999 DAS schedule in year 2000, i.e., 120 DAS for full-time vessels (48 for part-time and 10 DAS for the occasional vessels).
- C. Proposed adjustment to 142 DAS: 142 DAS for full-time vessels (48 for part-time and 10 DAS for the occasional vessels).

6.2.7.2 Summary of results

The results of the economic analysis are summarized in Table 19 and in the following bullets:

Table 19. DAS options – No access to the closed areas

	A. 51 DAS (Status Quo)	B.120 DAS	C.142 DAS
DAS per full-time vessel	51	120	142
Landings (million pounds)	14.6	29.1	30.2
Ex-vessel price per pound	7.07	5.66	5.55
Total Revenue (million \$)	103.3	164.2	167.3
Variable Costs (million \$)	11.7	27.7	29.4
Producer Surplus (million \$)	83.5	118.8	119.4
Consumer Surplus (million \$)	10.2	39.5	42.6
Net Benefits (million \$)	93.5	158.4	161.9
Employment (Crew*DAS)	77,672	169,323	176,953

Table 20. DAS options – Relative change from status quo (51 DAS) levels

	B.120 DAS		C.142 DAS	
	Change from status quo (B-A)	% Change from status quo	Change from status quo (C-A)	% Change from status quo
Change in Total Revenue	60.8	59%	63.9	62%
Change in Variable Cost	16.0	135%	17.5	150%

	B.120 DAS		C.142 DAS	
	Change from status quo (B-A)	% Change from status quo	Change from status quo (C-A)	% Change from status quo
Change in Producer Surplus	35.4	42%	35.9	43%
Change in Consumer Surplus	29.5	294%	32.5	325%
Change in Net Benefits	64.8	69%	68.5	73%
Change in Employment (Crew*DAS)	91,651	118%	99,281	128%

- The proposed increase in DAS allocations for year 2000 to 120 or 142 DAS for full-time vessels (with the corresponding increase in DAS allocations of the part-time and occasional permit holders) is estimated to have positive economic impacts on the sea scallop industry and net national benefits.
- The net national benefits are estimated to increase by \$64.8 million for 120 DAS, and by \$68.5 million for 142 DAS option compared to the status quo DAS schedule of 51 DAS for full-time boats (Table 22).
- Scallop landings are estimated to increase to 29.1 million pounds with the proposed increase in DAS allocations to 1999 levels, from 14.6 million under the 51 DAS option.
- The ex-vessel price per pound of scallops is expected to decline to about \$5.66 per pound from \$7.07 estimated with the 51 DAS option.
- The consumer benefits, as measured by consumer surplus will increase by \$39.5 million. The corresponding increase in the consumer surplus for the 142 DAS option is \$42.6 million.
- The scallop revenues of the fleet are expected to increase by \$61 million for 120 DAS and by about \$64 million for the 142 DAS option.
- The producer surplus (revenues minus variable costs) also is expected to increase by \$35.4 million, and by \$35.9 million respectively for 120 and 142 DAS options.
- Employment in the sea scallop fishery as measured by CREW*DAS will more than double with the proposed management adjustment (Table 22).
- The 120 or 142 DAS that would be allocated to full-time vessels under proposed management adjustment will exceed the break-even DAS point and most vessels will be able to fully cover their fixed and variable costs and earn profits (Table 24).
- The economic impacts discussed in this section are short-term impacts for year 2000. Although 142 DAS may result in higher net benefits in the short-term (2000), the long-term effects may differ. Under the 120 DAS options the scallop landings will be less, and will allow more scallops to grow and produce higher yield in year 2001. As a result, the economic benefits of the 120 DAS option may exceed the benefits of the 142 DAS option in year 2001.

6.2.7.3 Landings and DAS projections for year 2000

The landings were estimated combining biomass projections with an empirical approach based on the landings per DAS information in the open areas for 1998 fishing year (March 1998-February 1999), and for months March through August in 1999. Based on this information average landings per DAS for 1999 was estimated as follows:

$$(1) \quad L/DAS_{99} = L/DAS_{98} * ((L/DAS_{\text{March-Aug.99}}) / (L/DAS_{\text{March-Aug.98}}))$$

In the next step, the increase in the biomass for the mid-year in 2000 is estimated by taking the ratio of the biomass of the two adjacent years using the biological model estimates for Georges Bank biomass (BGB) and Mid-Atlantic biomass (BMA).

$$(2) \quad B_{2000\text{-mid-year}}/B_{1999\text{-mid-year}} = (BGB_{99} + BMA_{99} + BGB_{2000} + BMA_{2000}) / (BGB_{99} + BMA_{99} + BGB_{98} + BMA_{98})$$

The landings/DAS estimated from equation (1) was multiplied by the ratio obtained from equation (2) to derive an estimate of landings/ DAS for year 2000.

$$(3) \quad L/DAS_{2000} = B_{2000\text{-mid-year}}/B_{1999\text{-mid-year}} * L/DAS_{99}$$

Finally, the landings for each DAS option was estimated by multiplying the projected DAS-used corresponding to these options.

$$(4) \quad L = DAS\text{-used}_{2000} * L/DAS_{2000}$$

The total DAS projections assume that active vessels will fully participate in the scallop fishery in year 2000 (Table 8 to Table 10). The landings and DAS estimates are presented in Table 21.

Table 21. Landings and DAS estimates for year 2000.

	B. 51 DAS (Status Quo)	B.120 DAS	C.142 DAS
98 FY Landings/DAS (LPUE)	410.12	410.12	410.12
98 March-August LPUE	410.62	410.62	410.62
99 March-August LPUE	912.00	912.00	912.00
Adjust-99 FISHERY (equation 1)	910.88	910.88	910.88
Increase in Biomass from mid-1999 to mid-2000 (equation 2)	1.45	1.32	1.31
Estimated LPUE in 2000 (equation 3)	1318.05	1200.54	1192.34
2000 projected DAS-used	11,096	24,189	25,279
Estimated Total landings (million pounds) (equation 4)	14.6	29.1	30.2

6.2.7.4 Ex-vessel price and revenue projections for year 2000

The price per pound of scallops and scallop revenues are estimated for year 2000 for three DAS alternatives, using the annual price model presented in 1999 Scallop SAFE report, Section 5.3.1 . The scallop revenues for these management options are calculated from the estimated prices and landings. The results could be summarized as follows:

- For Amendment 7 (status quo) schedule, with 51 DAS per full-time boat, the ex-vessel price would be expected to reach \$7.07 per pound of scallops (in 1997 real prices) as landings would decline to 14.6 million lbs. in year 2000. The expected revenues for this alternative are \$103 million for the same year (**Table 22**, scenario A).
- With the proposed increase in allocations to 120 DAS, the ex-vessel price is estimated decline to \$5.66 per pound of scallops because of higher landings (29.1 million pounds) under this scenario (**Table 22**, scenario B). The revenues will be higher, \$164million, however, compared to scenario A (51 DAS) because of the estimated increase in landings under the proposed DAS adjustment.
- The results for the 142 DAS option (scenario C) will be similar to that of the 120 DAS option, with an estimated ex-vessel price of \$5.55 per pound, landings of 30.2 million pounds, generating about \$167 million revenues for the scallop fleet.
- The net increase in the revenues of the scallop fishery for the proposed adjustment will be about \$60.8 million for the 120-DAS option, and \$63.9 for the 142-DAS option compared to the status quo management (51 DAS).
- The overall impacts on regional revenues and incomes, however, will be higher than this estimate because of the indirect and induced multiplier impacts. Indirect impacts include the impacts on sales, income, employment and value-added of industries that supply commercial harvesters, such as the impacts on marine supplies that sell fuel and oil to scallop vessels. The induced impacts represent the sales, income and employment resulting from expenditures by crew and employees of the indirect sectors. An input/output analysis conducted by NMFS (1998) estimated that sales, income and employment multipliers for the sea scallop fishery in the Northeast Region. The sales multiplier for the coastal counties in Northeast was estimated to be approximately 1.8 in 1997 for the scallop dredge and trawls. If this multiplier is applied to determine overall impacts, the increase in overall sales in the Northeast region will be about \$109 to \$115 million in 2000 for 120-DAS and 142-DAS options respectively. See Appendix 6, volume II of the Amendment 7 document, for the estimation of the regional multipliers.

These estimates should be interpreted with caution, however, for the following reasons:

- The ex-vessel price equation estimates that there will be a 6 cents price premium per unit of meat count on larger scallops. This estimation is based on an annual average price and the short-term market prices could deviate from this average. Nonetheless, it is uncertain at this time if the predicted price premium will materialize over the long-term since the increase in landings of large scallops is a relatively recent phenomenon.
- In estimating ex-vessel prices it was assumed that the average import prices would stay constant in year 2000. The ex-vessel prices and revenues would be lower (higher) than predicted in **Table 22**, if import prices declined (increased) compared to their 1998 levels.

- The sales and income multipliers were estimated for 1997 including only the backward linkages associated with the harvest of sea scallops.

6.2.7.5 Variable cost projections

The vessel costs are estimated for an average scallop vessel that has a GRT, HP, and crew size equivalent to the fleet average in 1997 real prices¹⁵. The variable costs, as defined here, include trip expenses such as food, fuel, oil, water and ice, as well as one-half of repair expenses, which generally are considered as semi-variable costs.

The variable costs are expected to be higher for the 120 and 142 DAS options, \$27 and \$29 million respectively, compared to the status quo 51-DAS option, \$12 million, because of higher DAS allocations and effort for the first two options compared to status quo (**Table 22**).

¹⁵ For a complete list of cost equations, see Amendment 7 (NEFMC 1998; Appendix 4, Section 3.3)

Table 22: Economic costs and benefits (in 1997 dollars).

	A. 51 DAS (Status Quo)	B.120 DAS	C.142 DAS
Average meat count	21.36	22.26	22.30
Landings (million pounds)	14.6	29.1	30.2
Ex-vessel price per pound	7.07	5.66	5.55
Total Revenue (in dollars)	103,351,310	164,240,521	167,278,018
Variable costs (in dollars)	11,761,413	27,692,105	29,381,745
Producer Surplus (in dollars) (Total Revenue – Variable Costs – Opportunity costs of labor)	83,469,078	118,845,235	119,395,355
Consumer Surplus (in dollars)	10,022,833	39,517,292	42,571,564
Benefits = (Producer+ Consumer Surplus) (in dollars)	93,491,911	158,362,527	161,966,918
Employment (in crew days =number of Crew*DAS)	77,672	169,323	176,953

6.2.7.6 Producer and consumer surpluses, net benefits and employment

Producer Surplus

- ◆ The producer surplus is measured by the difference in revenues and variable costs, and it includes profits and crew shares after deducting the opportunity costs of labor.
- ◆ The opportunity costs of labor per hour are assumed to be equal to the average hourly wage rate for 1998-99 for production and non-supervisory workers on private non-farm payrolls. The seasonally adjusted value is \$13.07 per hour. Total opportunity costs were obtained by multiplying this rate with the total crew hours in the scallop fishery ($13.07 \times 7 \times \text{DAS} \times 8$ hour per day).
- ◆ For the proposed adjustment (120 DAS), the producer surplus in scallop fishery is estimated to reach \$118 million in year 2000 whereas implementation of Amendment 7 schedule (51 DAS) is expected to reduce producer surplus to \$83 million in the same year (Table 22). Overall, continuation of the 1999 DAS schedule with the proposed adjustment will increase the producer surplus by \$45 million in year 2000.
- ◆ The corresponding values for the 142 DAS option are slightly higher, \$119 million for the producer surplus with a \$46 million increase from the status quo level (Table 23).

Table 23. The change in economic costs and benefits (in 1997 dollars)

	Change from status quo (51 DAS) in million \$	
	B.120 DAS	C.142 DAS
Change in Total Revenue	60.8	63.9
Change in Variable Cost	16.0	17.5
Change in Producer Surplus	35.4	35.9
Change in Consumer Surplus	29.5	32.5
Change Net Benefits	64.8	68.5

Consumer Surplus

- ◆ The proposed adjustment in DAS (120 DAS) is estimated to have positive impacts on the consumers, both by increasing the quantity of scallops and also by reducing their prices.
- ◆ The consumer surplus, which is measured as the difference of what consumers are willing to spend and what they actually pay, is expected to increase by \$29 million with the proposed adjustment to 120 DAS, compared to Amendment 7 schedule (**Table 23**).
- ◆ The corresponding increase in consumer surplus for 142-DAS option is slightly higher, \$32.5 million.

Net National Benefits

- ◆ The net national benefits are estimated as the sum of producer and consumer surpluses, and for the proposed management adjustment (120 DAS) they are expected to reach \$158 million.
- ◆ As a result, the continuation of the present DAS schedule with 120 DAS per full-time vessel will increase net national benefits by about \$65 million in year 2000. This translates into a 70 percent increase in net benefits compared to the level for the Amendment 7 schedule (\$93 million; NEFMC 1998).
- ◆ The net benefits are slightly higher for the 142-DAS option in the short term with an increase of \$68 million from the status quo level.
- ◆ The economic impacts discussed in this section are short-term impacts for year 2000. Although 142 DAS may result in higher net benefits in the short-term (2000), the long-term effects may differ. Under the 120 DAS options the scallop landings will be less, and will allow more scallops to grow and produce higher yield in year 2001 compared to the 142 DAS option. As a result, the economic benefits of the 120 DAS option may exceed the benefits of the 142 DAS option in year 2001.

Employment

Table 22 indicates that the employment as measured by CREW*DAS will more than double with the proposed management adjustment compared to the status quo option of 51 DAS.

6.2.7.7 Enforcement costs

The cost-benefit analysis assumes that there will be no significant change in the costs to administer, monitor and enforce DAS as a result of the proposed measures. The basis for this assumption is that under the proposed action, the costs associated with setting up a monitoring and enforcement system have already been covered under the mandates of Amendment 4 and Amendment 7 to the Atlantic Sea Scallop FMP. The proposed action is not expected to affect enforcement costs.

6.2.7.8 Economic Impacts on Vessels and Small Businesses

The small business administration (SBA) defines a small business entity in the commercial fishing industry as a firm with annual gross revenues up to \$3 million. In practice, although some firms own more than one vessel, the number of vessels is a reasonable proxy for the number of small business entities.

The scallop industry directly affected by the proposed action is composed primarily of small business entities. The 1999 SAFE report (NEFMC 1999b) includes extensive information on the vessels participating in the scallop fishery. Section 3.0 of the report provides information on the landings, revenues of the vessels by species, by gear sector, by major port, and state. A discussion of the day-at-sea utilization was provided in section 3.2.3 and the processing and the marketing sectors in section 3.2.5 of the SAFE report (NEFMC 1999b).

There were 365 limited access scallop permits issued during the most recent complete season (NEFMC 1999b; Table 29). Over 100 permits were attached to vessels that were inactive or to persons that had a Confirmation of Permit History. If their participation in the scallop fishery remained unchanged, these vessels would not be affected by regulations during the 2000 season. Twenty-six of the remaining active vessels were either part-time or occasional. Based on their small days-at-sea allocation, it seems unlikely that the occasional permit category could be significantly impacted by sea scallop regulations. Almost all of the active part-time permit vessels, however, depended on scallops for least 5 percent of their 1998 revenues (see Tables 18 and 19 in section 5.2.2 for the composition of revenues for part-time and occasional boats of SAFE report). In contrast, dependence on scallop revenues was at least 70 percent or more of total revenues for 167 out of 206 active full-time boats with an average of 78% for all full-time boats (NEFMC 1999b; Tables 17 and 18).

The Regulatory Flexibility Act (RFA) requires government agencies to evaluate the financial impacts of regulations on small businesses. According to current NMFS guidelines, if more than 20 percent of the small businesses in a particular industry are affected by the regulations, the regulations are considered to have an impact on a "substantial number" of these entities. Since the proposed regulations will affect all vessels with a limited access scallop permit, the "substantial number" criterion of RFA would be met.

Furthermore, the economic impacts on small business entities are considered to be "significant" if the proposed regulations are likely to cause any of the following:

- a) A reduction in annual gross revenues by more than 5 percent;
- b) An increase in total costs of production by more than 5 percent as a result of an increase in compliance costs;

- c) An increase in compliance costs as a percent of sales for small entities at least 10 percent higher than compliance costs as a percent of sales for large entities;
- d) Costs of compliance that represent a significant portion of capital available to small entities, considering internal cash flow and external financing capabilities; or
- e) A number (two percent as a "rule of thumb") of small businesses being forced to cease business operations.

Since the proposed action is submitted as a final rule, an RFA and a threshold analysis are not required. The information needed for such analyses are presented here, however, in the context of the economic impacts on vessels and other small business entities.

Impacts on vessels

The proposed DAS options included in this framework will have positive economic impacts on the vessels compared to the status quo (51) DAS. The estimated revenues, costs, crew shares, and profits per full-time vessel for the three DAS schedules (Amendment 7, and proposed adjustment to 120 DAS) are shown in Table 24. The results can be summarized as follows:

- ◆ The revenues per full-time vessel will increase by about 70% for the proposed action (120 DAS), and by 97% for the 142 DAS option.
- ◆ This result is valid only for the full-time vessels that use their allocations in full. For example, during the 1998 fishing year, only 159 out of the 215 full-time vessels used more than 120 DAS to fish for scallops. If a full-time vessel fished only 80 DAS, for example, even though its DAS allocation was increased to 120 or 142 DAS, its revenues would not be affected as significantly with the proposed adjustment compared to a vessel which fully use its allocation.
- ◆ Although the operational and trip costs per vessel will be higher for the proposed adjustment (120 DAS) and for 142 DAS option, the increase in revenues under these options more than offset higher costs of fishing.
- ◆ Both the profits per vessel and crew shares are estimated to exceed the Amendment 7 levels with 51-DAS (Table 24).

The economic viability of the scallop vessels is examined by break-even concept, which estimates the number of DAS necessary to cover total variable and fixed costs of a vessel. The results for the status quo, i.e., 51 DAS option indicate that

- For the full-time scallop vessels that have no other revenues except from the scallop fishery, 51 DAS may be sufficient to produce the necessary level of income to cover fixed and variable costs. This result is valid, however, if the import prices, costs of fuel and other variable costs per DAS stayed constant at their 1998 levels. The results also assumes that the catches in the open areas will average 1,318 lbs. per DAS (as estimated in Table 21).
- Although the break-even even point is estimated to be only 44 DAS for the status quo (51 DAS) option, the profits with 51 DAS, \$27,000 per average vessel, would be substantially lower compared to the 120 and 142 DAS options. The actual profits per

vessel would vary from this average depending on the size, horsepower and activity (DAS-used) of the vessels, and also depending on the captain skills, crew size and the lay system. As a result, some vessels might not break-even-even under the status quo.

- Because the difference between the break-even DAS and the DAS allocation is small (only 7 DAS) , a small reduction in prices, or an increase in costs may push the break-even-even point above the DAS allocation, that is above 51 DAS, jeopardizing the financial viability of a vessel.

The results of break-even analysis for the 120 and 142 DAS options are shown in Table 24 and can be summarized as follows:

- The DAS allocations will greatly exceed the break-even-even points for the 120 DAS and 142 DAS options, which are 65 and 68 DAS respectively. Break-even DAS differ because of changes in catch rates, prices and other factors under the different alternatives.
- Therefore, the proposed DAS adjustment will have positive impacts on the financial viability of the scallop vessels. The profits from scallop fishing per full-time vessel will also be much higher for these options, ranging from \$134,000 to \$173,000 on the average.
- These are estimates for an average vessel only. Again the actual values will vary from vessel to vessel depending on the gross-tonnage, horse-power and activity (DAS-used) of the vessel and also depending on the captain skills, crew size and the lay system.
- With 120 or 142 DAS, the financial risks are smaller, since the allocations exceed the break-even points (65 and 68 DAS) significantly. An increase in costs or a decline in prices will increase the break-even-even points above the levels estimated in Table 21. It would be unlikely, however, for the break-even point to exceed the DAS allocation (120 or 142 DAS). In other words, fishing 120 or 142 DAS will greatly reduce the financial risks for the scallop vessels.

As the 1999 SAFE report (NEFMC 1999b; Section 3.2.2) shows, the majority of the scallop vessels, had a high dependence on the scallop revenues, whereas others earned income from other fisheries as well. As Table 14 in the SAFE report shows, 130 full-time vessels that used 90 percent or more of their allocation (on the average 143 DAS) in 1998 derived on the average 87.6 percent of their revenues from scallops. Almost all full-time vessels earned some portion of their income from monkfish as a bycatch, however, averaging \$250 per DAS. Including the monkfish revenues improves the break-even points, although not significantly, as shown in Table 24.

Again, the results of this analysis should be interpreted with caution:

- The break-even-even figures shown in Table 4 are estimated for a vessel with a HP and GRT equal to the fleet average. Thus, with 120 DAS option for example, some vessels in the scallop fleet will need more than 65 days-at-sea, and some will need less, to break-even from scallop fishing alone.

- The estimates would change if the landings per DAS, import prices, and a variety of other factors that affect operational (such as the cost of fuel) and fixed costs change.
- As a result, the break-even estimates will be more useful in comparing the alternatives with each other rather than indicating absolute points for financial viability.

Table 24. Economic impacts on vessels

	A. 51 DAS (Status Quo)	B.120 DAS	C.142 DAS
Revenue per vessel	475,029	814,786	939,653
Operational costs per vessel	54,058	137,379	165,046
Trip Costs per vessel	50,354	105,105	121,477
Crew Shares	234,663	383,767	442,314
Fixed Costs	159,241	159,241	159,241
Profits	27,066	134,399	173,051
Break-even DAS	44	65	68
Average monkfish revenues per DAS	249	249	249
Break-even DAS including monkfish revenues	41	59	62

Impacts on other small business entities

The processors, wholesaler and retailers, while not directly subject to the regulations, will still be indirectly affected through the increase in the domestic harvest of sea scallops. The Scallop Safe Report (1999b) provides information on dealers and processors by region, state or port¹⁶. Only 240 out of the 371 dealers from Northeast region purchased sea scallops during the 1998 fishing season. Three quarters of these dealers were from New England, but Maine dealers had relatively little volume. Purchases are concentrated among a relatively few dealers, with 24 of the dealers buying 90 percent of the sea scallop meats. Sea scallop purchases amounted to at least 50 percent of total fish purchases by 50 dealers. These results overstate dependence on the US sea scallop fishery to the extent that dealers rely on imports and do not report purchases of non-regulated species.

During the 1998 calendar year, 25 processing companies earned about \$57 million in gross revenues from the sale of domestic and imported scallop products. Massachusetts and Virginia were the leading states.

Sea scallop marketing is thought to be mostly regional through restaurants, fish markets, super markets and institutions. There is a dearth of quantitative information, however, on the number of wholesalers who sell scallop products.

The proposed DAS adjustment is expected to have positive economic impacts on the scallop dealers, processors and wholesalers by increasing the domestic supply of the scallops to these entities. On the other hand, the lack of detailed data, particularly the level of imports/exports associated with the purchase of sea scallops, prohibits a quantitative impact assessment of these sectors.

6.2.7.9 Assumptions and Methodology

The impacts are examined using an economic model that combines biological inputs with an annual price model and vessel cost equations.

¹⁶ In Sections 3.2.5.2 through 3.2.5.4, and Section 3.3 (see also Tables 25 through 27)

- ◆ The landings are estimated combining biomass projections with an empirical approach based on the landings per DAS information in the open areas for 1998 fishing year (March 1998-February 1999), and for months March through August in 1999 (methodology explained in Section 6.2.7.3).
- ◆ The vessel costs are estimated for an average scallop vessel that has a GRT, HP, and crew size equivalent to the fleet average. Trip and variable costs are estimated in 1997 prices as a function of days-at-sea, GRT, HP and crew. The fixed costs are estimated as a function of GRT. The fixed costs also include the transponder costs, which are estimated to be about \$2,500 to \$2,700 including the message costs based on a five-year amortization of equipment costs. The cost equations were presented in Amendment 7 (NEFMC 1998; Appendix 4, Section 3.3).
- ◆ Scallop revenues are estimated from the projected landings and the annual price model in 1997 real prices. The price model was presented in the 1999 Scallop Fishery Management Plan SAFE Report (NEFMC 1999b; Section 5.3.1).
- ◆ All the price variables are corrected for inflation and expressed in 1997 prices by deflating current levels by consumer price index (CPI) for food.
- ◆ Disposable income is also expressed in 1997 dollars by deflating nominal values with the GDP implicit deflator.
- ◆ Import prices, and the disposable income are held constant at their 1998 level, but in 1997 constant prices when estimating ex-vessel prices.
- ◆ The maximum crew size is restricted to 7.
- ◆ Crew shares are estimated using a 40/60 lay-system under to which the crew receives 60% of the gross stock and pays for the trip expenses.
- ◆ The opportunity costs of labor are assumed to be equal to average wage rate for 1998-99 for production and non-supervisory workers on private non-farm payrolls. The seasonally adjusted value is \$13.07 per hour.
- ◆ The results from the proposed management adjustments (120 or 142 DAS per full-time vessel) are compared to the results for status quo management that assumes the continuation of the Amendment 7 DAS schedule (with 51 DAS per full-time vessel).

6.2.7.10 Sources of uncertainty in the analysis

The economic impacts of the DAS-options were analyzed based on the available information about the vessel costs and characteristics, crew shares, prices, landings and revenues of the scallop vessels. The numerical results of this analysis should be interpreted with caution due to uncertainties about the likely changes in

- factors affecting scallop resource abundance
- fishing behavior
- fixed costs
- variable costs

- import prices
- bycatch and revenues from other fisheries
- the crew share system
- the number of active vessels
- structural changes in ownership
- the composition of fleet in terms of tonnage, HP and crew size of the active vessels
- disposable income and preferences of consumers for scallops
- price differences and premium on small versus large scallops.

The empirical results should be used to compare the management alternatives with each other since a change in the variables listed above will change the numerical results in the same direction in most cases. For example, a decrease in import prices would lead to a decrease in ex-vessel prices and revenues below the levels estimated here. An increase in the disposable income of the consumers will produce the opposite effect. While these changes would affect the absolute levels of net benefits, break-even DAS and so on, the ranking of the alternatives in terms of their impacts on revenues, costs, and net benefits are not expected to change.

6.2.8 Social and Community Impacts of the Proposed Action

National Standard 8 of the MSFCMA states that:

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

A description of the affected human environment is provided in Section 5.2 of Amendment 7 to the Atlantic Sea Scallop FMP. Management measures implemented through Framework Adjustment are intended to fall within the scope of the FMP and the rebuilding program initiated by Amendment 7. In general, the social and community impacts of this framework are short-term in nature, especially since the proposed action will be effective only until February 28, 2001. The long-term social impacts of this framework adjustment fall within the scope of the impact assessments provided in the respective FMP documents.

Three major sea scallop ports, New Bedford (MA), Cape May (NJ) and Norfolk (VA) accounted 83 percent of the total sea scallops landings in the 1998 fishing year. Similarly, among the states along the Atlantic coast from Maine to North Carolina, three states, Massachusetts, New Jersey and Virginia were the leading scallop producing states accounting 89 percent of the total 1998 fishing year landings. Overall, Massachusetts landed 47 percent, Virginia 29 percent, and New Jersey 13 percent of the scallops, whereas other Northeast states including Maine, Rhode Island and Connecticut landed the remaining 11 percent. Consequently, the increase in DAS allocations will have positive impacts on the economies of these major ports and the corresponding states by increasing the scallop landings and revenues.

The social and community impacts of this framework adjustment will be positive for the sea scallop fleet and the communities in which the vessels land their product. The proposed action will allow the sea scallop fishery to benefit from an increase in day-at-sea allocations, compared to the status quo under Amendment 7. The magnitude of positive social and community impacts resulting from this action will depend on the magnitude of predicted positive economic impacts for the scallop fleet. Positive social and community impacts are therefore likely.

6.3 Finding of No Significant Impact (FONSI)

NOAA Administrative Order 216-6 provides guidance for the determination of significance of the impacts of fishery management plans and amendments. The five criteria to be considered are addressed below.

1. *Can the proposed action be reasonably expected to jeopardize the long-term productive capability of any stocks that may be affected by the action?*

The proposed action is part of an ongoing stock rebuilding programs established by Amendment 7 to the Atlantic Sea Scallop FMP that is based on reducing overall fishing mortality, by limiting fishing effort, prohibiting effort in select locations and seasons, and controlling fishing technology.

New analysis indicate that rebuilding has occurred more quickly than anticipated by Amendment 7 and that the conservation benefits of closed areas are greater than formerly assumed. New biological projections indicate that the Amendment 7 fishing mortality targets will rebuild biomass to the Amendment 7 targets within five to ten years, consistent with the SFA mandates.

2. *Can the proposed action be reasonably expected to allow substantial damage to the ocean and coastal habitats?*

The proposed action is not expected to change the impacts on ocean and coastal habitats. The proposed action will continue the 120 day-at-sea allocations in effect during 1999.

3. *Can the proposed action be reasonably expected to have an adverse impact on public health or safety?*

Since the management measures in the Atlantic Sea Scallop FMP provides flexibility and continuous opportunity to fish within the constraints of the conservation needs of the plan, the Council expects that the proposed measures will not negatively impact safety. The measures do not require vessels to take risks that compromise safety of the vessel and crew.

4. *Can the proposed action be reasonably expected to have an adverse effect on endangered, threatened species or a marine population?*

The management measures proposed in Scallop Framework Adjustment 11/Multispecies Framework Adjustment 29 may affect, but are not likely to jeopardize the continued existence of endangered and threatened species. In a general sense, the effects of scallop fishing were reviewed during the approval of Amendment 7 and prior amendments to the Atlantic Sea Scallop FMP. This review resulted in a no jeopardy opinion as a result of the observed interactions with scallop fishing gear and the proposed management measures. This action is expected to cause total scallop fishing effort to remain at current levels or decline, depending on activation of latent fishing effort. No gear changes are required or contemplated.

5. *Can the proposed action be reasonably expected to result in the cumulative adverse effects that could have a substantial effect on the target resource species or any related stocks that may be affected?*

The measures in this framework are management adjustments to achieve optimum yield from the scallop resource without jeopardizing the stock rebuilding program for sea scallops or for groundfish. For this reason, the Council does not expect the action to have any cumulative adverse effect on the

target resources. In Amendment 7, the Council recognized that effort shifts could occur that may have an adverse impact on other stocks, although the direction and magnitude of that impact could not be predicted. The proposed measures do not substantially change the effect of the stock rebuilding plan on any related stocks nor result in any cumulative adverse effect.

Based on the preceding criteria and analysis, the Council proposes a finding of no significant impact.

FONSI STATEMENT: In view of the analysis presented in this document and in the FSEIS for Amendment 7 to the Atlantic Sea Scallop Fishery Management Plan, the proposed action will not significantly affect the quality of the human environment with specific reference to the criteria contained in NAO 216-6 implementing the National Environmental Policy Act. Accordingly, the preparation of a Supplemental Environmental Impact Statement for this proposed action is not necessary.

**Assistant Administrator
For Fisheries, NOAA**

Date

Regulatory Impact Review (Regulatory Flexibility Act and Executive Order 12866)

6.3.1 Introduction

This section provides the information necessary for the Secretary of Commerce to address the requirements of Executive Order 12866 and the Regulatory Flexibility Act (RFA).

The purpose and need for management (statement of the problem) is described in Section 3.0 of this document. The proposed action is described in Section 5.1. Alternatives to the proposed action are also summarized in Section 5.2. The economic impacts are described in section 6.2.6.4 and summarized below under the discussion of how the proposed action is characterized under EO 12866 and the RFA.

6.3.2 Executive Order 12866

The proposed action does not constitute a significant regulatory action under Executive Order 12866 for the following reasons:

- a) The Framework 12 proposed action is developed to adjust the day-at-sea allocations for limited access scallop vessels during the 2000-01 fishing year to be consistent with the fishing mortality target approved in Amendment 7. This adjustment will increase the day-at-sea allocations of full-time vessels from 51 to 120 DAS. The allocations for the part-time and occasional vessels will also be increased, from 20 to 48 and from 4 to 10 DAS respectively for the 2000 fishing year. As analyzed in Section 6.2.7.8 of the framework document, these adjustments will have positive impacts on vessel revenues, scallop consumers and the economy. The consumer benefits as measured by the consumer surplus will increase by an estimated \$29.5 million, the producer surplus by \$35.4 million and net national benefits by \$64.8 million. For these reasons, the proposed action will not adversely affect in a material way the economy, productivity, competition and jobs. The proposed action will not have an annual effect on the economy of more than \$100 million.
- b) For the same reasons as above, the proposed action will not significantly affect competition, jobs, the environment, or state, local or tribal governments and communities. The increase in day-at-sea allocation will not affect safety or public health. The proposed day-at-sea adjustment maintains the day-at-sea allocations at the same level as the allocations for the 1999 fishing year. The majority of the full-time boats used 120 or more days-at-sea to fish for scallops during the last fishing year, as well as during the previous years¹⁷.
- c) The proposed action will not create an inconsistency or otherwise interfere with an action taken or planned by another agency. No other agency has indicated that it plans an action that will impact the same fishery.
- d) The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of their recipients.

¹⁷ See Table 15 in Scallop 1999 SAFE report (NEFMC 1999b), section 3.2.2 for DAS used by full-time vessels in 1996 and 1998.

- e) The proposed action does not raise novel legal or policy issues. Existing day-at-sea regulations have managed Atlantic Sea Scallop and Multispecies fisheries in the Northeast since 1994.

6.4 *Regulatory Flexibility Analysis (RFA)*

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and recordkeeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. On the basis of this information, the Regulatory Flexibility Analysis determines whether the proposed action would have a “significant economic impact on a substantial number of small entities.”

The RFA applies to any rule or regulation that must undergo “notice and comment” under the Administrative Procedures Act (APA), specifically those rules published as proposed rules. When RFA applies, the Council must assess the impacts of the regulations to determine if they will have a “significant economic impact on a substantial number of small entities”. Since this action is submitted as a final rule, not subject to further notice and comment under the APA, the RFA does not apply. However, Section 6.2.7.8 includes information on the small businesses in the scallop fishery, and a discussion of the economic impacts on the entities that will be affected by the proposed regulations. The impacts of the DAS adjustment for the fishing year 2000 as proposed by this Framework were estimated to be positive on small businesses.

6.5 *Endangered Species Act (ESA)*

Section 7 of the ESA requires federal agencies conducting, authorizing or funding activities that may affect threatened or endangered marine species to ensure that those effects do not jeopardize the continued existence of listed species. See Section 6.2.6.4.2 of this document for a discussion of impacts on ESA-listed species. The management measures proposed in Framework Adjustment 12 may affect, but are not likely to jeopardize the continued existence of endangered and threatened species. The Council recognizes that this conclusion does not change the basis for the previous determination that overall operation of fisheries managed under the Atlantic Sea Scallop FMP, without modification, is likely to jeopardize the continued existence of endangered species under NMFS jurisdiction. These management measures are not expected to result in the adverse modification of right whale critical habitat. Should activities associated with the Sea Scallop FMP change significantly or new information become available that alters this determination, the Council will reinitiate consultation.

6.6 *Marine Mammal Protection Act*

The New England Fishery Management Council has reviewed the impacts of the Atlantic Sea Scallop FMP on marine mammals and concludes that this management action is consistent with the provisions of the MMPA and will not alter existing measures to protect the species likely to inhabit the management unit. See Section 6.2.6.4.2 for a discussion of these impacts.

6.7 *Coastal Zone Management Act (CZMA)*

Upon submission of Amendment 7 to the Atlantic Sea Scallop FMP, the Council also conducted a review of the FMP for its consistency with the coastal zone management plans of the affected states. All the states concurred with the Council’s consistency determinations. See Section 8.6 of Amendment 7 for the Council’s consistency determinations. The response letters of the states are on file at the Council office. The Council has determined that the proposed action is within the scope of measures already reviewed for consistency with states’ CZM plans and is, therefore, consistent with the Atlantic Sea Scallop FMP. The Council has notified potentially affected states of this action and of its determination that the action is consistent with its earlier determination.

6.8 *Paperwork Reduction Act (PRA)*

No new or additional reporting burdens is anticipated from the proposed action, since it adjusts a measure that is already in place. This adjustment does not affect the man-hour burden estimates in the PRA analysis for Amendment 7. No PRA analysis is therefore necessary.

7.0 GLOSSARY

Amendment - a change to a fishery management plan (see FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council also may make limited changes to FMPs through a "framework adjustment procedure" (see below).

B_{MSY} - the equilibrium stock biomass that maximizes the surplus production of the stock, i.e. when the difference between the stock growth rate (recruitment and somatic growth) and natural mortality is maximized. This is usually at one-half of the stock's carrying capacity.

Break-even DAS - The number of days-at-sea for fishing necessary to cover total variable and fixed costs of a vessel.

Consumer surplus - It is a measure of consumer benefits and is defined as the maximum amount a consumer would be willing to spend on good or service minus the amount she/he actually pays for it. The consumer surplus is calculated by a formula that sums the benefits of all consumers of a product.

Days absent - an estimate by port agents of trip length. This data was collected as part of the NMFS weigh-out system prior to May 1, 1994.

Days-at-sea (DAS) - the total days, including steaming time that a boat spends at sea to fish.

DAS Permit - Vessels qualified to be in the limited access sea scallop fishery are required to apply for a DAS permit each year to use their annual DAS allocation.

Full-Use - Refers to a vessel with a limited access permit and which used all of its DAS, not counting the 10 DAS that it may carry-over into the next fishing year.

Zero-Use - Refers to a vessel with a limited access permit that did not report using any DAS.

Partial-Use - reported using fewer than 10 DAS less than its annual allocation. For example, a vessel which had 165 DAS in the 1997-98 fishing year but used less than 155 DAS is referred to as a partial use vessel.

History Permit - A history permit is issued to qualified fishermen who apply in writing to retain their eligibility for the limited access fishery in the future. History permits are associated with vessels that sank, were destroyed, or were sold. They may be converted into a DAS permit any time during a fishing year. (This definition is repeated below.)

Environmental Impact Statement (EIS) - an analysis of the expected impacts of a fisheries management plan (or some other proposed action) on the environment and on people, initially prepared as a "Draft" (DSEIS) for public comment. After an initial EIS is prepared for a plan, subsequent analyses are called "Supplemental".

Exempt fisheries - Any fishery determined by the NMFS Regional Administrator to have less than 5 percent regulated multispecies as a bycatch, by weight, of total catch according to 50 CFR ? 648.80(a)(7).

Exploitation rate - the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish groundfish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual exploitation rate is 55%.

Fishermen - the term traditionally used in New England to refer to fishers of both genders.

Fishing effort - the amount of time and fishing power used to harvest fish. Fishing power includes gear size, boat size and horsepower.

Fishing mortality (F) - (also see *exploitation rate*) a measurement of the rate of removal of fish from a population by fishing. Fishing mortality (F) is the rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate).

FMP - Fishery management plan. Documents describing a fishery and the rules that govern it. These documents form the basis for federal regulations for fisheries under management authority of the regional management councils. These councils are authorized to manage fisheries and are required to prepare fishery management plans by the Magnuson-Stevens Fishery Conservation and Management Act. The New England Fishery Management Council

prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Fixed costs - Costs that do not vary with output. For the fishing vessels these include expenses such as insurance, license, repairs, office expenses, interest, dock expenses and transponder costs.

Framework adjustments - adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Limited-access permits - permits issued to vessels that met certain qualification criteria by a specified date.

$F_{0.1}$ - a conservative target fishing mortality rate used to determine allowable fishing levels.

F_{MSY} - the fishing mortality rate that would produce MSY when the stock biomass is at B_{MSY} under equilibrium conditions. This is usually one-half of the stocks intrinsic rate of population growth, r .

History permit - A History Permit is issued to qualified fishermen who apply in writing to retain their eligibility for the limited access fishery in the future. History Permits are associated with vessels that sank, were destroyed, or were sold. They may be converted into a DAS permit any time during a fishing year.

Natural mortality - a measurement of the rate of fish deaths from all causes other than fishing such as predation, disease, starvation and pollution. The rate of natural mortality may vary from species to species.

Net national benefits - The sum of producer and consumer surpluses. The net national benefits of the management alternatives are estimated as the sum of changes in producer and consumer surpluses from the status quo levels.

Maximum Sustainable Yield (MSY) - the maximum biological yield that can sustainably removed from the resource. The actual yield will annually fluctuate around this value over time, depending on environmental conditions and the success of the management program. Technically, the value is calculated as the biological removals that would be realized by fishing the stock at F_{MSY} when biomass is at B_{MSY} and at equilibrium.

Minimum spawning stock threshold - the minimum spawning stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Multispecies - the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

Open access - describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunity cost - The cost of forgoing the next best opportunity. For example, if a fisher's next best income alternative is to work in construction, the wage he would receive from construction work is his opportunity cost. The opportunity costs of labor for the scallop fishery are assumed to be equal to average wage rate for 1998-99 for production and non-supervisory workers on private non-farm payrolls.

Overfished - A measure of stock biomass that is below a threshold level that would provide adequate spawning activity, ie. the stock's productive capacity.

Overfishing - A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Possession-limit-only permit - an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Producer surplus - The producer surplus is measured by the difference in revenues and variable costs, and it includes profits and crew shares after deducting the opportunity costs of labor.

Proposed rule - a federal regulation is usually published in the *Federal Register* as a proposed rule with a time period for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Recruitment - the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery.

Regulated groundfish species - cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. (These species are usually caught with large-mesh net gear.)

Secretarial review process - a process, which normally takes 140 days from the time the Council, submits a plan or amendment to the Secretary of Commerce until its implementation. The Secretary of Commerce reviews and possibly approves the plan or amendment, which must meet the National Standards, of the Magnuson Fishery Management and Conservation Act and other federal laws. The other laws include the National Environmental Policy Act, the Marine Mammal Protection Act, the Endangered Species Act, the Regulatory Flexibility Act, etc.

Spawning stock biomass (SSB) - the total weight of fish in a stock that are old enough to reproduce.

Stock - a grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod).

Sustainable Fisheries Act (SFA) – An Act passed by Congress in 1997 to re-authorize the Magnuson Fisheries Conservation and Management Act. The SFA among other things required the Councils to revise their definitions of overfishing, implement rebuilding programs for overfished stocks, identify essential fish habitat, and introduced three new national standards.

TAC - Total allowable catch including all sources of fishing mortality such as discards, bycatch of the species in question in other fisheries and recreational landings.

Variable costs - These costs vary with the rate of output. In the case of fisheries, variable costs refer to non-labor costs such as food, fuel, oil, water, ice and part of repair costs.

VTS - an electronic vessel tracking system, often used to record the time a vessel is at sea on a fishing trip or to enforce closed areas.

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10.0 COMMENTS AND RESPONSE TO COMMENTS

During the development of Framework Adjustment 12, the Council received one written comment. The Fisheries Survival Fund (FSF), represented by Brand & Frulla of Washington, DC, submitted a comment (included below) prior to the first framework meeting. This letter re-iterated the FSF proposal for consideration of an alternative that would increase the day-at-sea allocations to 142 for full-time scallop vessels. It also commented on proposals to allow access into closed areas, which will be included in Framework Adjustment 13.

In addition to this written comment, the Council heard numerous oral comments at the framework meetings. During the first meeting, there was broad support for consideration of the FSF proposal and the Council included the alternative and analyzed the effects in the final framework document. After the analysis and final framework document were available, the oral comments generally supported the proposed action (Alternative 1), since the analysis showed that the higher day-at-sea allocation would be more likely to exceed the fishing mortality target, would decrease benefits in the 2001 fishing year, would increase the probability of future decreases in day-at-sea allocations, and would make it more difficult to achieve a conservation-neutral strategy for closed area access.