

shoreside work such as construction or farming. The patterns and combinations vary among regions. For example, in the Carteret County area and the southern area (Onslow, Pender New Hanover, and Brunswick counties), shrimp trawling was the most important but it ranked third in the Pamlico area (Hyde, Beaufort, Pamlico, and Craven counties). Shrimp trawlers in Dare County were unlikely to use crab pots but those of the southern counties did. Some are more vulnerable than others to environmental and regulatory change, too; thus, Johnson and Orbach (1996: 66) noted that fishermen of the Pamlico area were at most risk because they have fewer alternatives available to them (North Carolina Division of Marine Fisheries 1999: 8-9).

Johnson and Orbach (1996) also profiled the fishermen as 96% male, 97% white/Caucasian, and 2.7% African-American (see Diaby 1999: 33). Education levels, family size, average age and years fished vary greatly among the regions they studied (McCay and Cieri 2000: 180-181).

4.0 STATUS OF THE CURRENT FISHING YEAR: MARCH 1, 2000 TO FEBRUARY 28, 2001

4.1 *Biological Factors – Estimates of fishing mortality and biomass* (D. Hart; A. Applegate)

4.1.1 Sea Scallop Landings During the 2000 Fishing Year

Data for the first few months of the 2000 fishing year show significant increases in landings, mainly attributable to the increase in scallop biomass and favorable recruitment in many areas. The most active fishing areas were in the South Channel and to the west of the Hudson Canyon Closed Area. Catches ranged from 1,500 to 2,000 lbs. per day, according to some reports. These catch rates sometimes exceeded the shucking capacity of a seven-man crew, keeping vessels from targeting small scallops and/or shucking some of the last-caught scallops after the vessel crossed the day-at-sea monitoring line. This latter change occurred mainly around New Bedford, MA in January to April.

4.1.2 Update Assessment through July 2000

Fishing mortality was estimated by applying the observed catches to the biomass data in the projection model. Unlike the SAW 29 method which estimated the trend from an empirical estimator and adjusted mortality to equal the long-term average from the survey catch at length, the current estimate is based on the computed F that estimates a yield consistent with the observed catches in each area. The following assessment areas were assumed in the projections: Northeast Peak and Edge, South East Part, South Channel, Closed Area II-South, Closed Area II-North, Closed Area I, the Nantucket Lightship Area, the New York Bight, Hudson Canyon Area, DelMarVa, and the VA/NC Area.

Total fishing mortality, assuming a 30 percent rate of unreported sources of fishing mortality, for 1999 was 0.16 for Georges Bank scallops (Table 150) and 0.16 in the Mid-Atlantic (Table 152). This compares to an Amendment 7 fishing mortality threshold of 0.83 in 1999. While the composite rate is substantially lower than the Amendment 7 threshold, it was aided by year-around closures of important scallop fishing areas. Sixty-three percent of the scallop biomass was not available to fishing, according to regulations. These areas were closed to scallop fishing to reduce groundfish mortality and prevent the fishery from disrupting spawning activity, while groundfish stocks rebuild.

During 2000, the Council opened the southern portion of Closed Area II for limited scallop fishing. This area as well as the South Channel assessment unit had notably high and unsustainable fishing mortality (Table 150). In Closed Area II, fishing mortality was higher than a sustainable level because the TAC was based on scallop biomass throughout Closed Area II, while the fishing activity took place only in the southern portion. Fishing mortality in the South Channel area was high because it is one of the few productive scallop areas that remain open and LPUE was high enough to attract the fishing effort allocated to the scallop fleet, primarily from New England-based vessels.

The estimates for the Georges Bank stock will overestimate fishing mortality in Closed Area II and underestimate fishing mortality elsewhere, if the Closed Area II catches this year³³ are less than expected in Framework 13. Recent preliminary statistics for the Closed Area II scallop fishery are that only 763 mt of scallops were landed, or about 24 percent of the assumed catch in Table 150. As a result, the fishing mortality rate for Closed Area II is likely to be less than estimated and the fishing mortality rates for the South Channel and Southeast Part are likely to be higher.

Table 150. Fishing mortality and biomass estimates for Georges Bank scallops in 1999, based on 1999 Albatross survey data.

Assessment unit	Total F_b	DAS	Observed Catch (MT)	Total biomass (MT)
Closed Area I	0.00	0	0	11,695
Closed Area II - North	0.00	0	0	5,999
Closed Area II - South	0.63	3,819	3,238	7,338
Northern Edge	0.31	1,314	532	1,947
Nantucket Lightship Area	0.00	0	0	11,536
South Channel	0.56	3,501	1,521	3,505
Southeast Part	0.31	2,320	1,112	4,082
Composite	0.16	10,954	6,402	46,102

Similarly, about 53 percent of the biomass in the Mid-Atlantic was in closed areas (Table 152). The allocated fishing effort was therefore displaced into the remaining open areas and fishing mortality was therefore high, above sustainable levels that prevent the scallop biomass to rebuild from growth.

These fishing mortality estimates are sensitive to both the estimated catch distribution and to the assumed survey dredge efficiency. In the first case, the composite fishing mortality rate is a biomass weighted average across the assessment units. Different proration of the catch would therefore affect the composite estimate. In the second case, the fishing mortality estimate is derived from the ratio of catch to total biomass. The latter quantity is a total swept area biomass estimate from the survey data, adjusted to account for the estimated dredge efficiency. If dredge efficiency during 1999 was higher than assumed, then the biomass would be lower and fishing mortality would be underestimated, and vice versa.

³³ The assumed catch in the 2000 Closed Area II fishery was used for the projection because the catch will have been taken from the resource between the 1999 and 2000 Albatross surveys, the period assessed with the projection model.

Table 152. Fishing mortality and biomass estimates for Mid-Atlantic scallops in 1999, based on 1999 Albatross survey data.

Assessment unit	Total F_b	DAS	Observed Catch (MT)	Total biomass (MT)
Delmarva	0.63	4,325	1,990	4,758
Hudson Canyon Area	0.00	0	0	20,862
NY Bight	0.31	7,868	3,791	16,002
VA/NC Area	0.00	0	0	2,212
Composite	0.16	12,193	5,782	43,834

4.1.3 Update Assessment through July 2001

Fishing mortality was estimated by applying assumed catches to the projected 2000 biomass data (Section 5.1). Total fishing mortality, assuming a 30 percent rate of unreported sources of fishing mortality, for 2000 would be 0.20 for Georges Bank scallops (Table 154) and 0.10 in the Mid-Atlantic (Table 156), given the assumptions the PDT made about the distribution and the amount of fishing effort in 2000. This compares favorably to an Amendment 7 fishing mortality threshold of 0.34 for both stocks in 2000. While the composite rate is substantially lower than the Amendment 7 threshold, it was also aided by year-around closures of important scallop fishing areas.

Unlike, 1999 when Closed Area I and the Nantucket Lightship Area were not open for scallop fishing, only 25 percent of the scallop biomass was unavailable to fishing, according to regulations. During 2000, the Council opened the southern portion of Closed Area II, the center of Closed Area I, and the northeast corner of the Nantucket Lightship Area for limited scallop fishing. For purposes of assessment and projections, the PDT assumed that the target TAC based on $F_{\text{target}} = 0.2$ would apply in the closed areas. Closed Area II – South is expected to have no fishing mortality following the 2000 survey, so a fishing mortality rate of zero was applied.

These fishing mortality rates are really approximations of the expected fishing effort and catches in 2000. These results are therefore sensitive to these assumptions and if the observed catch in 2000 exceed these assumptions, the projections will overestimate future biomass and catch in future years.

Table 154. Fishing mortality and biomass estimates for Georges Bank scallops in 2000, based on 1999 Albatross survey data.

Assessment unit	Total F_b	DAS	Observed Catch (MT)	Total biomass (MT)
Closed Area I	0.25	2,496	3,105	16,049
Closed Area II - North	0.00	0	0	8,535
Closed Area II - South	0.00	0	0	6,512
Northern Edge	0.25	1,068	610	2,899
Nantucket Lightship Area	0.25	2,276	2,767	14,575
South Channel	0.50	3,531	2,073	5,423
Southeast Part	0.25	1,848	1,179	5,635
Composite	0.20	11,219	9,734	59,628

Similarly, about 60 percent of the biomass in the Mid-Atlantic is in closed areas (Table 152) at the time of the 2000 survey, according to projections based on the 1999 survey. The allocated fishing effort was therefore displaced into the remaining open areas and fishing mortality will therefore be high, above sustainable levels that prevent the scallop biomass to rebuild from growth. It may not increase above the 1999 level due to the scallop fishery access program for the Georges Bank closed areas. Concentrated fishing effort during Spring 2000 in the NY Bight area may cause fishing mortality to exceed the assumed amount.

Table 156. Fishing mortality and biomass estimates for Mid-Atlantic scallops in 2000, based on 1999 Albatross survey data.

Assessment unit	Total F_b	DAS	Observed Catch (MT)	Total biomass (MT)
Delmarva	0.50	3,251	1,714	4,952
Hudson Canyon Area	0.00	0	0	36,600
NY Bight	0.25	6,610	4,053	20,914
VA/NC Area	0.00	0	0	2,992
Composite	0.10	9,861	5,767	65,459

4.1.4 Fishing mortality vs. day-at-sea use

During the current fishing year (March 1999 to February 2000), the total days allocated increased from 29,621 to 30,133 days for active vessels (vessels that participated in the scallop day-at-sea program during 1999). Full-time vessels received 120 days and up to 10 additional carry-forward days that were unused during the 1999 fishing year.

Based on each vessel's fishing activity in the 1999 fishing year, reduced by the days allocated in 2000 if applicable, the total days used in the 2000 fishing year is expected to be 24,828 days (Table 158). This estimate assumes that no inactive vessels³⁴ or vessels with a Confirmation of Permit History³⁵ re-activate a vessel in the scallop fishery during the 2000 fishing year. If all latent permits are reactivated and they had the same activity level as other full-time, part-time, and occasional vessels, it could bring the total days used up to 26,154 days (Table 158). As a result of the reduced day-at-sea allocations in 2000, total days-at-sea used are expected to remain nearly constant. This result is consistent with the day-at-sea projections for Amendment 7.

³⁴ An inactive vessel, for the purposes of this report, is one that held a 1998 limited access scallop permit, was allocated days, but chose not to fish for scallops and did not report days-at-sea.

³⁵ A Confirmation of Permit History documents limited access scallop history that could qualify another upgrade-compliant vessel to receive scallop days-at-sea in the future. This document signifies that a valid scallop permit is not currently assigned to a vessel.

Table 158. Status quo: Day-at-sea use in the 1999 fishing year with projected day-at-sea allocations and use for 2000 and 2001, accounting for the effect of the Georges Bank closed area scallop fisheries in 2000 on the projected carry over days.

	Full-time	Part-time	Occasional	Total
Number of Permits				
Active vessels	215	24	2	241
Inactive vessels	7	6	22	35
Confirmation of permit histories	56	8	0	64
Total	278	38	24	340
1999 DAS allocations with carryover-active vessels only	27,619	1,572	430	29,621
1999 DAS-used	23,970	1,075	21	25,065
% DAS-used of total allocation with carryover	87%	68%	5%	85%
2000 DAS Allocations (without carryover)	120	48	10	
Active Vessels	25,800	1,152	20	26,972
Inactive Vessels	840	288	220	1,348
Total Allocation	26,640	1,440	240	28,320
2000 DAS Allocations (with carryover)				
Active Vessels	27,295	1,211	29	28,535
Inactive Vessels	880	280	438	1,598
Total Allocation	28,175	1,491	467	30,133
2000 Projected DAS-used				
Active Vessels only	23,767	1,040	21	24,828
% DAS-used of total allocation with carryover	87%	86%	73%	87%
Inactive vessels (if fished in 1999)	766	240	319	1,326
Total potential DAS-used	24,534	1,280	340	26,154
2000 Projected DAS-used, accounting for Closed Area fishery				
Active vessels only	21,942	830	0	22,773
% DAS-used of total allocation with carryover	80%	69%	0%	80%
Inactive vessels within Closed Area II	766	240	319	1,326
Total expected DAS-used	22,709	1,071	319	24,099
Change from expected DAS-used	-7%	-16%	-6%	-3%
Active vessels only	21,942	830	0	22,773
2001 DAS Allocations (without carryover)	49	20	4	
Active Vessels	10,535	480	8	11,023
Inactive Vessels	343	120	88	551
Total Allocation	10,878	600	96	11,574
2001 DAS Allocations (with carryover)				
Active Vessels	12,353	802	324	13,479
Inactive Vessels	343	120	88	551
Confirmation of permit histories	2,728	157	-	2,885
Total Allocation	15,424	1,079	412	16,915

	Full-time	Part-time	Occasional	Total
Percent of DAS on inactive vessels	20%	26%	21%	20%
2001 DAS Allocations (accounting for Closed Area fishery in 2000)				
Active vessels	10,942	524	8	11,475
Inactive vessels	343	120	88	551
Confirmation of permit histories	2,728	157	-	2,885
Total allocation	14,013	802	96	14,911
Percent of DAS on inactive vessels	22%	35%	92%	23%
Change from expected DAS-allocated	-9.1%	-25.7%	-76.7%	-11.8%
Active vessels	10,942	524	8	11,475
2001 Projected DAS-used				
Active Vessels only	11,638	618	16	12,272
% DAS-used of total allocation with carryover	94%	77%	5%	91%
Inactive vessels (if fished in 2000)	323	92	4	420
Total potential DAS-used	11,961	710	20	12,691
2001 Projected DAS-used (accounting for Closed Area fishery in 2000)				
Active vessels only	10,640	520	8	11,168
% DAS-used of total allocation with carryover	97%	99%	100%	97%
Inactive vessels (if fished in 2000)	323	92	4	420
Total potential DAS-used	10,964	612	12	11,588
Change from expected DAS-used	-8.3%	-13.8%	-38.9%	-8.7%

The effect of these additional restrictions for trips in Georges Bank closed areas in 2000 is to reduce the annual allocation of days to vessels that elect to take closed area trips. Besides the increased net benefits from re-opening the closed areas, the effect of the automatic 10-day accumulation for Closed Area trips is to reduce the annual day-at-sea allocations by the difference between the actual time at sea and the 10 day allocation. For example, 100 trips that averaged five days, dock-to-dock, would accumulate 1000 days but only 500 days were actually fished. If these trips were taken by vessels that would have otherwise used all of their annual day-at-sea allocation, rather than from vessels with latent effort, then the management regime for the Georges Bank closed areas had the potential for reducing days used by 500. The day-at-sea tradeoff has a significant potential for reducing fishing effort in the open areas and for the resource as a whole. Framework Adjustment 13 allocated six 10-day trips for limited access scallop vessels and if the fishermen used all the closed area trips, it would reduce fishing effort by at least 50 percent in the open areas, but less effort would shift to the closed areas due to the tradeoff. For various reasons, the preliminary data for 2000 (Section 4.1.6) show much lower effort in Closed Area II, which accounts for half of the allocated closed area trips.

Day-at-sea allocations in the 2001 fishing year are slated to decline to 11,574 days for the 276 active scallop vessels during 1999, 49 (plus potential carry-forward days) for each full-time vessel. Again the actual days used in 2000 and the Georges Bank closed area fisheries could have an impact on this estimate if they result in a change in carry-forward days.

4.1.5 Increasing day-at-sea allocations to 1999-2000 levels

It appears unlikely that some of closed areas will not be open for scallop fishing during the 2001 fishing year, due to a variety of factors and concerns. Some of these latter concerns may keep large portions of closed areas off-limits unless the concern passes or they can be addressed by new technology or fishing practices. In addition, the Council may consider adding new area closures in the Mid-Atlantic and on Georges Bank to conserve small scallops.

Another potential option is to increase the 2001 day-at-sea allocations to the 1999-2000 levels, while preventing fishing mortality to exceed the thresholds set by Amendment 7. Under this scenario, the days allocated, including the effect of carry-forward days from the 2000 fishing year, would increase to 31,573 days, or 120 days for each full-time vessel (Table 160). Based on each vessel's fishing activity during the 1999 fishing year and the effect of the 2000 and 2001 day-at-sea allocations, the days used by active scallop vessels is predicted to be 25,518 days. This outcome assumes that no inactive vessels or Confirmation of Permit Histories reactivate. If the 64 inactive vessels in 1999 fish like active vessels, the day-at-sea use could increase to as much as 26,972 days (Table 160).

Table 160. Increasing 2001 day-at-sea allocation to 2000 levels: Day-at-sea use in the 1999 fishing year with projected day-at-sea allocations and use for 2000 and 2001, accounting for the effect of the Georges Bank closed area scallop fisheries in 2000 on the projected carry over days.

	Full-time	Part-time	Occasional	Total
Number of Permits				
Active vessels	215	24	2	241
Inactive vessels	7	6	22	35
Confirmation of permit histories	56	8	0	64
Total	278	38	24	340
1999 DAS allocations with carryover-active vessels only	27,619	1,572	430	29,621
1999 DAS-used	23,970	1,075	21	25,065
% DAS-used of total allocation with carryover	87%	68%	5%	85%
2000 DAS Allocations (without carryover)	120	48	10	
Active Vessels	25,800	1,152	20	26,972
Inactive Vessels	840	288	220	1,348
Total Allocation	26,640	1,440	240	28,320
2000 DAS Allocations (with carryover)				
Active Vessels	27,295	1,211	29	28,535
Inactive Vessels	880	280	438	1,598
Total Allocation	28,175	1,491	467	30,133
2000 Projected DAS-used				
Active Vessels only	23,767	1,040	21	24,828
% DAS-used of total allocation with carryover	87%	86%	73%	87%
Inactive vessels (if fished in 1999)	766	240	319	1,326
Total potential DAS-used	24,534	1,280	340	26,154

	Full-time	Part-time	Occasional	Total
2000 Projected DAS-used, accounting for Closed Area fishery				
Active vessels only	21,942	830	0	22,773
% DAS-used of total allocation with carryover	80%	69%	0%	80%
Inactive vessels within Closed Area II	766	240	319	1,326
Total expected DAS-used	22,709	1,071	319	24,099
Change from expected DAS-used	-7%	-16%	-6%	-3%
Active vessels only	21,942	830	0	22,773
2001 DAS Allocations (without carryover)	120	48	10	
Active Vessels	25,800	1,152	20	26,972
Inactive Vessels	840	288	220	1,348
Total Allocation	26,640	1,440	240	28,320
2001 DAS Allocations (with carryover)				
Active Vessels	28,115	1,642	468	30,225
Inactive Vessels	840	288	220	1,348
Confirmation of permit histories	6,681	377	-	7,058
Total Allocation	35,636	2,307	688	38,631
Percent of DAS on inactive vessels	21%	29%	32%	22%
2001 DAS Allocations (accounting for Closed Area fishery in 2000)				
Active vessels	26,207	1,196	20	27,424
Inactive vessels	840	288	220	1,348
Confirmation of permit histories	6,681	377	-	7,058
Total allocation	33,728	1,862	240	35,830
Percent of DAS on inactive vessels	22%	36%	92%	23%
Change from expected DAS-allocated	-5.4%	-19.3%	-65.1%	-7.3%
Active vessels				
2001 Projected DAS-used	23,655	1,020	21	24,696
Active Vessels only	84%	62%	5%	82%
% DAS-used of total allocation with carryover	707	179	10	896
Inactive vessels (if fished in 2000)	24,362	1,199	31	25,592
Total potential DAS-used				
2001 Projected DAS-used (accounting for Closed Area fishery in 2000)		23,586	1,017	19
Active vessels only	90%	85%	96%	90%
% DAS-used of total allocation with carryover	707	179	10	896
Inactive vessels (if fished in 2000)	24,293	1,196	29	25,518
Total potential DAS-used	-0.3%	-0.2%	-6.0%	-0.3%
Change from expected DAS-used	25,800	1,152	20	26,972

4.1.6 Effects of the Scallop Fishery in the Georges Bank Closed Areas in 2000

It is too early to evaluate the effects of the scallop fishery during the 2000 fishing year, because at least half of the fishing effort in the program has not taken place from delaying access to the Nantucket Lightship Area and Closed Area I. As of August 14, 2000, 80 vessels took 164 trips within Closed Area I, accounting for 1,640 days out of a total day-at-sea allocation of about 31,000 days. Although these totals are significantly less than in 1999, vessel participation in the Nantucket Lightship Area and Closed Area I may be substantially higher than the most recent activity in Closed Area II. The two new fishing areas are closer to the scallop ports and the scallop catch rates are expected to be substantially higher, potentially attracting substantial effort. The effort shift and the day-at-sea tradeoff is expected to reduce fishing mortality elsewhere and allow biomass to recover, according to the Framework Adjustment 13 analysis.

4.1.6.1 Latest Catch Statistics from the 2000 Georges Bank Closed Area II Scallop Fishery

The Georges Bank Closed Area fishery had not concluded by the time that this report was written. The information given in Table 162 summarizes the latest catch reports, courtesy of the Northeast Regional Office/ Fishery Statistics Division: Resource Conservation And Trade Section.

Although statistics are preliminary and subject to change, the Closed Area II fishery has concluded. According to the latest report, only 26 percent of the scallop TAC had been landed on 164 trips by 80 participating vessels (Table 164). These results are considerably less than predicted by Framework Adjustment 13, so any projections that use the Framework Adjustment 13 estimates will tend to underestimate biomass in Closed Area II and overestimate biomass and future catch in other fishing areas open during 2000. Yellowtail flounder catch rates are higher in 2000 than those encountered during 1999 (Section 3.2) because vessels are not catching the extra-large scallops, as observed last year, and targeting scallops in different parts of Closed Area II, according to reports. Scallop catches held steady near 1,400 lbs. per vessel day throughout the season (Figure 24), much lower than those encountered in 1999 (Figure 4). This lower LPUE in Closed Area II and the higher LPUE in other open scallop fishing areas made it less attractive for some vessels to fish in Closed Area II.

Table 162. Total allowable catch (TAC) and status of the Closed Area II fishery as of August 14, 2000. Source: <http://www.nero.nmfs.gov/ro/fso/scal081400.htm>.

	Directed Scallop Fishery (meat weight)	Yellowtail Flounder Bycatch (live weight) Closed Area II and I
Total Allowable Catch (TAC)	6,468,179 lbs	1,582,323 lbs
	2,934 mt	717.75 mt
Total Catch to date (lbs.)	1,681,605	523,951
Percent of TAC	26%	33%

Table 164. Distribution of trips and vessel participation during the Closed Area II scallop fishery from June 15, 2000 to August 14, 2000. Source: <http://www.nero.nmfs.gov/ro/fso/scal081400.htm>.

	Trips	Number of Vessels
Number of Trips	1	23
	2	32
	3	23

	Trips	Number of Vessels
	4	2
	5	.
	6	.
Total Number of Participating Vessels		80
Number of Scallop Fishing Trips		164
Percentage of Observed Trips		51.2%

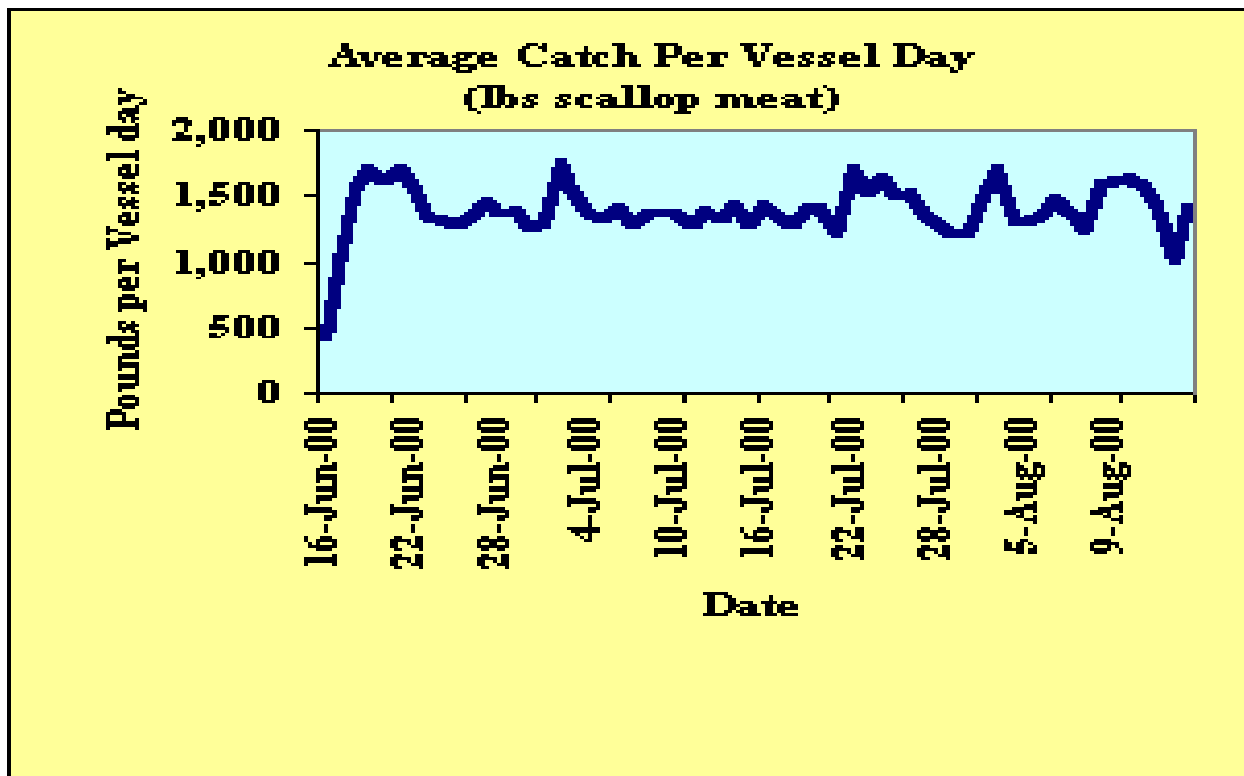


Figure 24. Average scallop catch per vessel day in Closed Area II. Source: <http://www.nero.nmfs.gov/ro/fso/scal081400.htm>.

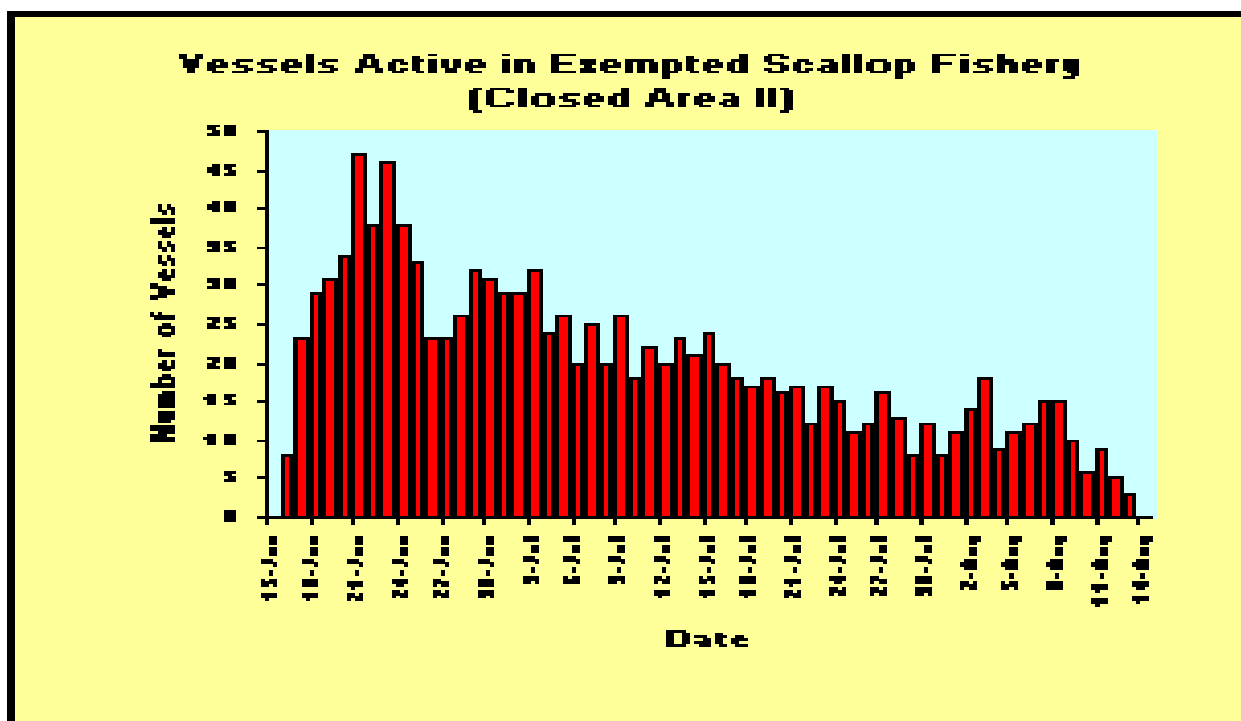


Figure 26. Daily vessel activity in Closed Area II during 2000. Source: <http://www.nero.nmfs.gov/ro/fso/scal081400.htm>.

4.1.6.2 Latest Catch Statistics from the 2000 Georges Bank Nantucket Lightship Area Scallop Fishery

Early reports from the Nantucket Lightship Area, which opened to fishing on August 15, 2000, are that very high scallop catch rates are being observed. Scallop catches appear to be declining slowly, varying between 2,100 and 3,000 lbs. per vessel day (Figure 27), near the estimated shucking capacity. Captains are also reporting signs of predation by starfish within the area, but the catch of yellowtail flounder is low (0.01 lbs. of yellowtail flounder per pound of scallop meats; Table 166), consistent with the expectation in Framework Adjustment 13.

Table 166. Total allowable catch (TAC) and status of the Nantucket Lightship Area fishery as of September 5, 2000. Source: <http://www.nero.nmfs.gov/ro/fso/scal090500.htm>.

	Directed Scallop Fishery (meat weight)	Yellowtail Flounder Bycatch (live weight) Nantucket Lightship
Total Allowable Catch (TAC)	5,390,149 lbs.	109,125 lbs
	2,445 mt	49.50 mt
Total Catch to date (Pounds)	940,264	13,225
Percent of TAC	17%	12%

Table 168. Trips and vessel participation during the Nantucket Lightship Area scallop fishery from June 15, 2000 to August 14, 2000. Only one trip per vessel is allowed under Framework Adjustment 13. Source: <http://www.nero.nmfs.gov/ro/fso/scal090500.htm>.

Total Number of Participating Vessels	97
Percentage of Observed Trips	27.6%

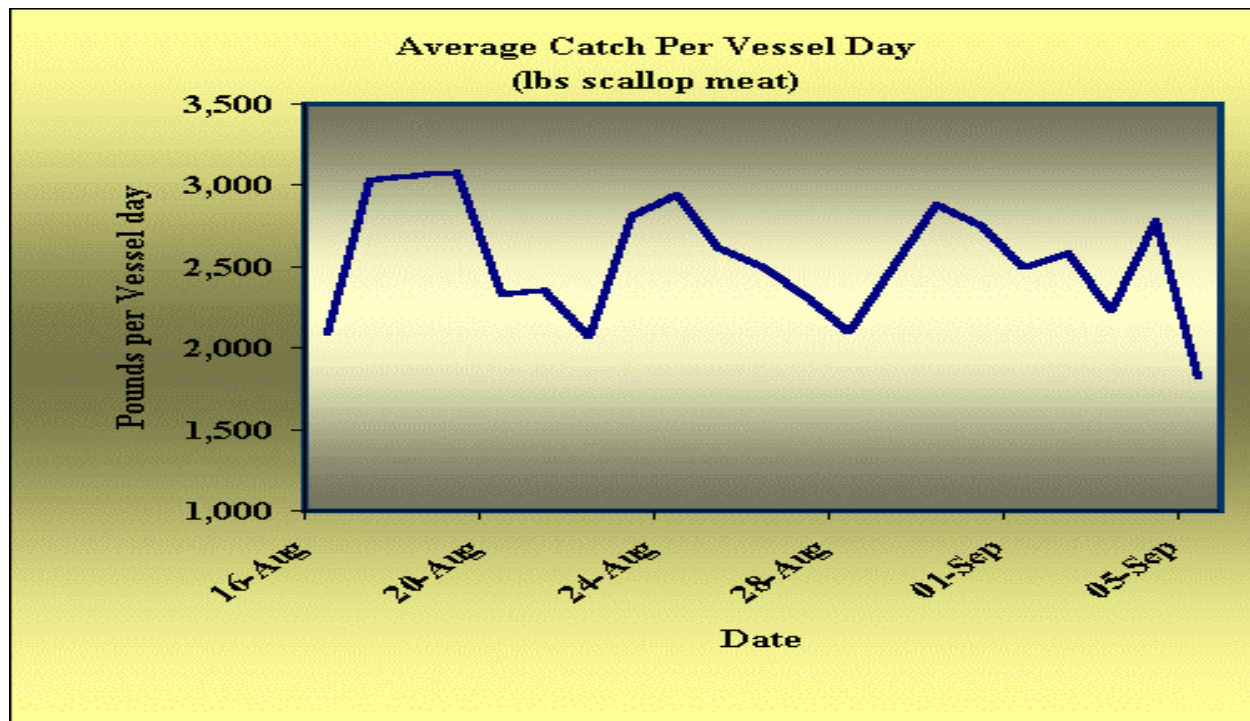


Figure 27. Average scallop catch per vessel day in the Nantucket Lightship Area. Source: <http://www.nero.nmfs.gov/ro/fso/scal090500.htm>.

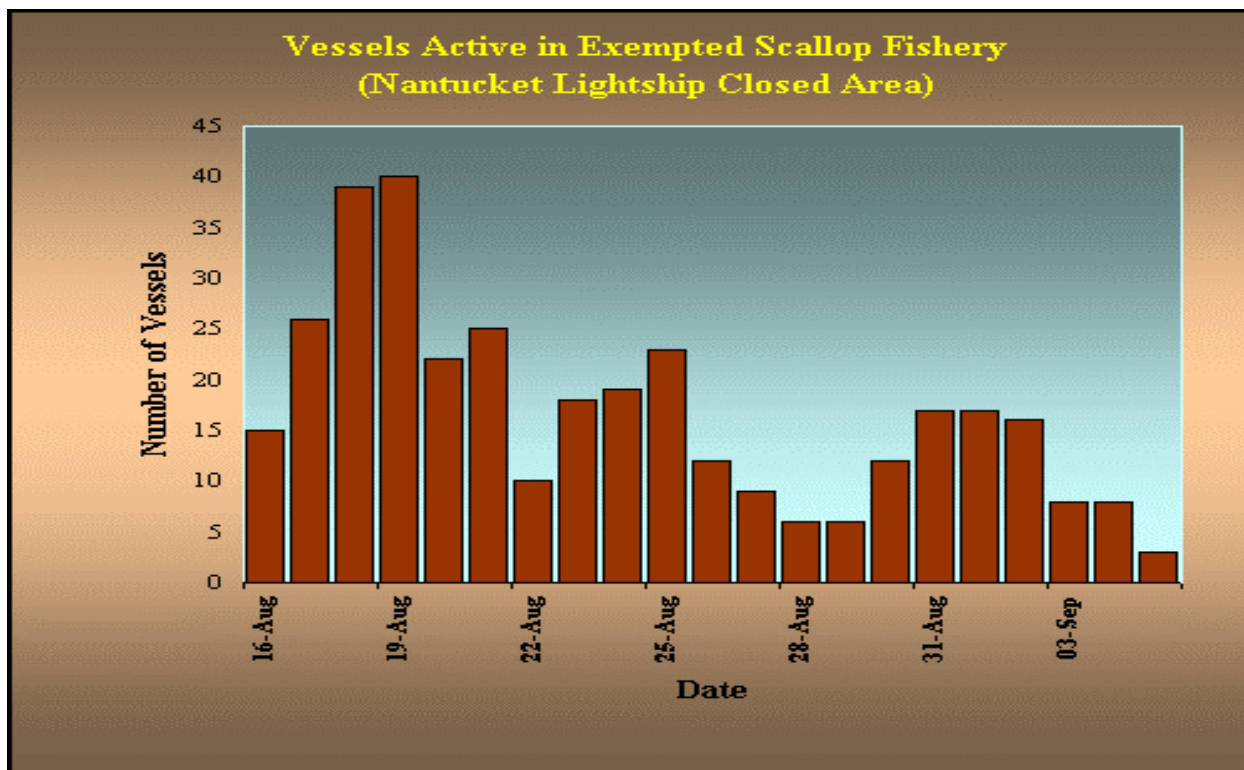


Figure 29. Daily vessel activity in the Nantucket Lightship Area during 2000. Source: <http://www.nero.nmfs.gov/ro/fso/scal090500.htm>.

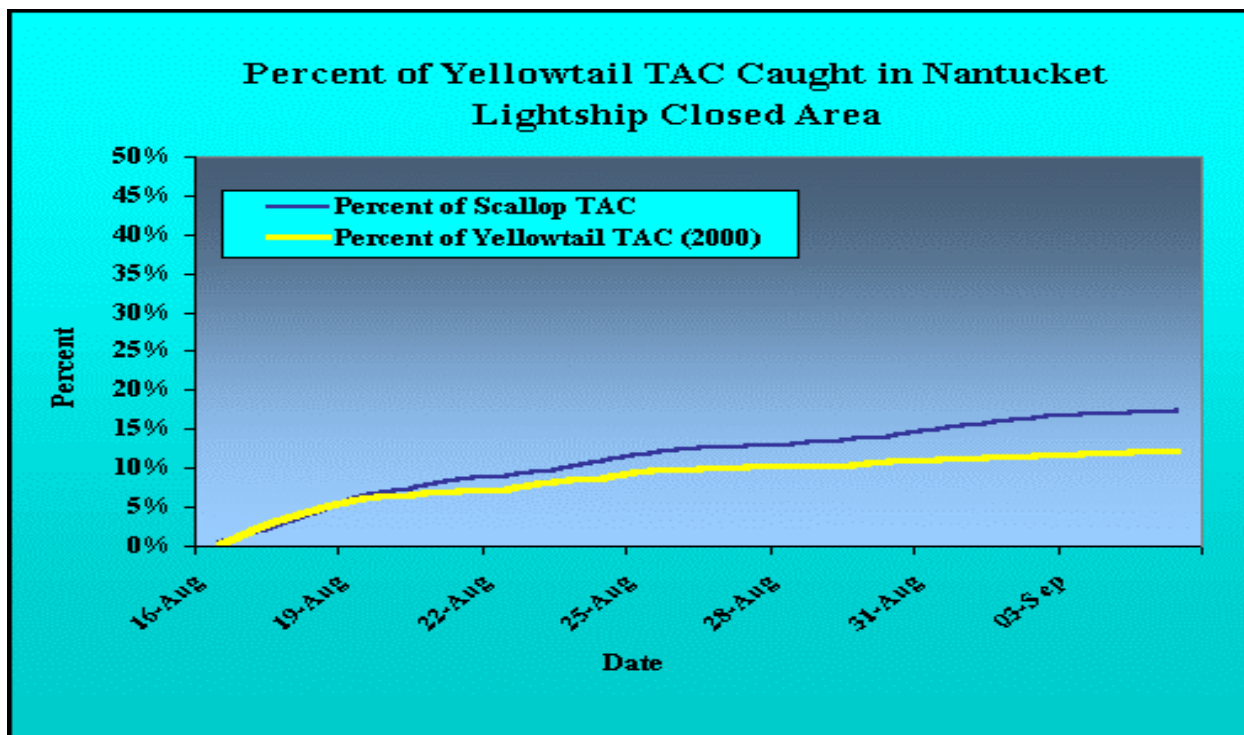


Figure 30. Cumulative plot of scallop and yellowtail flounder catches vs. the TACs for the Nantucket Lightship Area. Source: <http://www.nero.nmfs.gov/ro/fso/scal090500.htm>.

4.1.7 Fishing mortality targets and projected biomass

Amendment 7 revised and extended the existing annual day-at-sea allocations to achieve the new mortality thresholds and biomass targets, in compliance with the Sustainable Fisheries Act. Prior to Amendment 7, the maximum fishing mortality target was 0.71, intended to prevent recruitment overfishing. With the Sustainable Fisheries Act, the Congress directed the regional fishery management councils to revise their plans to make them consistent with a primary goal of rebuilding biomass to conditions that could produce maximum sustainable yield (MSY).

To bring the Atlantic Sea Scallop FMP into compliance with the SFA, the Council adopted a new overfishing definition that used yield-per-recruit reference points as a proxy for the biomass that could produce MSY (i.e. B_{MSY}) when fished at a mortality rate that maximizes yield (i.e. F_{MSY}). Associated with this overfishing definition was a control rule that had an objective of rebuilding to the biomass target in five years when biomass was less than $\frac{1}{2}B_{MSY}$ and 10 years when biomass was between $\frac{1}{2}B_{MSY}$ and B_{MSY} . Since insufficient data were available to estimate total biomass, the biomass target was expressed in terms of survey weight per tow instead of total biomass.

Amendment 7 also specified a plan to reduce mortality below the threshold ($F_{MSY} = F_{max}$) and achieve rebuilding in no more than ten years. Due to the homogenous nature of the scallop fishery, it was impossible to design a day-at-sea allocation scheme that would allow faster rebuilding in one area versus another area. The Council also included in the amendment two Mid-Atlantic closed areas to promote faster rebuilding for that stock, although the impacts on rebuilding could not be estimated at that time. New projections that account for the impacts of closed areas and new estimates of the $F - DAS$ relationship are included in this report (Section 4.1.4).

The day-at-sea allocation schedule, anticipated days used, estimated landings, and estimated biomass are given in Table 169. Biomass was expected to reach the targets in nine years (2007), while landings would decline to 6.1 million lbs. and then increase to 18.8 million lbs. in 2008, after the resource had rebuilt. The annual fishing mortality targets were calculated to achieve rebuilding, allowing a gradual reduction in fishing effort during the 1999 to 2002 when overfishing would no longer occur. According to this schedule, 11,389 day-at-sea would be allocated in 2000 to achieve a fishing mortality rate equal to 0.34, producing landings of 6.1 million lbs.

The projections in Amendment 7 assumed that all areas would be open to fishing and that the faster rebuilding in the closed areas would be counter-balanced by slower rebuilding in the open areas. The individual effects related to area closures were not specifically taken into account.

Table 169. Historical or projected day-at-sea use, landings, and stock biomass.

Year ³⁶	Target F	Day-at-sea allocation per vessel	Actual or estimated	Actual or estimated	Actual or estimated biomass (kg/tow)
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³⁶ Actual values prior to the 1998-99 fishing year; projections or estimates from Amendment 7 in 1999-00 and subsequent fishing years.