

FRAMEWORK ADJUSTMENT 33

to the

NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

**To achieve plan objectives in the  
2000 fishing year and implement other measures**

Prepared by

New England Fishery Management Council

in consultation with

National Marine Fisheries Service

Mid-Atlantic Council

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## 1. Introduction

### 1.1 Executive Summary

The New England Fishery Management Council (Council) is taking action to implement measures under an ongoing rebuilding plan for northeast multispecies groundfish stocks. This action is the fourth iteration of the annual plan review and adjustment process established by Amendment 7 to the Northeast Multispecies Fishery Management Plan (FMP) to ensure that rebuilding plan goals are met on a continuing basis.

The primary purpose of this action is to reduce or maintain fishing mortality rates of the five critical stocks below rebuilding targets established by Amendment 7 ( $F_{0.1}$  for Georges Bank cod, haddock and yellowtail flounder, and Southern New England yellowtail flounder, and  $F_{MAX}$  for Gulf of Maine cod ). While fishing mortality rates on most of the critical stocks under the Amendment 7 plan are below the targets, the rates on cod stocks are above targets and need to be reduced. Fishing mortality on Georges Bank cod needs to be reduced by 36 percent from the 1998 level. For Gulf of Maine cod, fishing mortality needs to be reduced 56 percent from the 1998 level. Recent analysis of landings data indicates that if discarding did not appreciably increase in 1999 then the fishing mortality rate may be approaching the Amendment 7 target of  $F_{max}$ . However, given record low spawning stock biomass, poor recent recruitment and decline in the survival ratios (recruits/spawning stock biomass),  $F_{max}$  remains inappropriate for rebuilding Gulf of Maine cod.

The regulations governing the annual review and adjustment process require the Multispecies Monitoring Committee (MSMC) to calculate target total allowable catch levels (TACs) for the five key stocks. The TACs enable the Council and National Marine Fisheries Service (NMFS) to monitor the fishery during the year relative to the plan objectives. The TACs for the 1999 fishing year are provided in the following table.

Stock	2000 TAC (metric tons)
Georges Bank cod	4,145
Georges Bank haddock	6,252
Georges Bank yellowtail flounder	4,618
Southern New England yellowtail flounder	951
Gulf of Maine cod*	1,918

\*NOTE: The plan objectives for Gulf of Maine cod specify that the TAC be based on a fishing mortality rate of  $F_{MAX}$  ( $F=0.29$ ), however, scientific advice in 1998 was that the stock is collapsing. In response to this grave advice, and in consideration of the ineffectiveness of previous actions to achieve the plan target for GOM cod, the Council took a precautionary approach. In Framework 27, it drafted measures designed to achieve a more conservative fishing mortality target,  $F_{0.1}=0.15$ , as a benchmark to significantly increase the likelihood that the plan target will not be exceeded. The 1999 MSMC report advised that given current stock conditions, the  $F_{max}$  objective remains inappropriate for

rebuilding GOM cod. **The 2000 TAC calculated to achieve the more conservative  $F_{0.1}$  target is 1,118 metric tons.**

The following is a summary of the proposed action:

### **Gulf of Maine Cod**

**Area closures:** Status quo area closures as contained in Frameworks 27 and 31, plus if 50 percent of the target TAC, (759 metric tons based on the average between  $F_{0.1}$  and  $F_{max}$  target) is landed by July 31, Cashes Ledge Closed Area will remain closed for one additional month (November) and Blocks 124 and 125 will close in January. The Western GOM Closed Area which is currently scheduled to end on April 30, 2001, would be extended for one additional year (expiring on April 30, 2002). (See Figure 2).

**Trip Limit:** Status quo trip limit as contained in Framework 31: 400 lbs./day with a maximum possession limit equal to ten times the daily limit (i.e. 4,000 pounds). Vessels may land a limited overage of cod as follows:

- Vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program are limited to 400 pounds for each day or part of a day on the trip. On trips under 24 hours a vessel may not land more than 400 pounds of cod, and may not land cod again until 24 hours have elapsed from the start of the prior trip, although the vessel may call-out of the DAS program before 24 hours have elapsed. On trips longer than 24 hours, a vessel may land 400 pounds of cod for each full day (24 hours) of the trip and 400 pounds for any part of a 24-hour period, provided it does not call out of the DAS program until the remainder of that 24-hour period has elapsed. A vessel on a trip longer than 24 hours and landing up to 400 pounds of cod for any part of a (24-hour) day, must call the hail line to report the overage and may not leave port or call out of the DAS program for the remaining part of the 24 hours.
- a vessel may not land more than 4,000 pounds, even if the trip duration exceeds ten days.

### **Party/charter closed area exemption program**

Party and charter vessels would be required to obtain an exemption certificate from NMFS to fish in any of the Gulf of Maine closed areas. A limited access vessel in the exemption program would be prohibited from fishing on a DAS while in possession of the certificate. Enrollment in the program is for a minimum of three months.

### **Georges Bank Cod**

**Trip Limit:** Status quo trip limit: 2,000 pounds per day, or part of a day; 20,000 pounds maximum possession limit. This action would eliminate the backstop adjustment mechanism authorizing the Regional Administrator to reduce the trip limit to prevent exceeding the TAC, and replace it with the following area closure.

**Area closure:** In addition to the year-round closures on Georges Bank, this action would close Blocks 109-114, 98 and 99 during May (see Figure 3). Limited Access and General Category scallop vessels and General tops are exempt from

the May closure within the parameters of existing regulations (8-inch twine top and 300 pound regulated species possession limit on limited access vessels, area and possession restriction on General Category vessels).

### **Large Mesh Permit Category**

The Council proposes changing the conditions of the Large Mesh Permit Category as follows:

- the minimum mesh size for otter trawls is reduced from 8 inches to 7 inches,
- the increased DAS allocated to otter trawl vessels fishing in this category would be reduced from 36 percent to 25 percent, and
- both trawl and gillnet vessels that enroll in this permit category can exit the category after one month. The proportion of DAS used while enrolled in this category would be deducted, on a percentage basis, from the vessel's regular Fleet or Individual DAS allocation.

### **Scallop vessel access to Closed Areas I and II and the Nantucket Lightship Closed Area**

The Council proposes a program to allow scallop dredge vessel access to groundfish closed areas. It will submit this action in a separate framework combining scallop management measures with the groundfish closed area exemption program (Multispecies Framework 34 and Scallop Framework 13).

The Council proposes that the measures in this framework be effective for the 2000 fishing year and that regulations be drafted such that they would remain in effect into the following fishing year pending the implementation of Amendment 13. Furthermore, the Council recommends that the action be implemented as a final rule considering the prior notice and opportunity for public comment in the development of alternatives and the timing of some of the measures relative to the start of the fishing year on May 1.

## 1.2 Background

### 1.2.1 Previous actions

**Amendment 7:** Amendment 7 became effective May 1, 1996. It established a rebuilding program for Georges Bank (GB) and Gulf of Maine (GOM) cod, GB haddock, and GB and Southern New England (SNE) yellowtail flounder stocks based primarily on days-at-sea (DAS) controls, area closures and minimum mesh size. As early as 1995, during the development of the amendment, the Council recognized issues that would have to be addressed after implementation and as the plan evolved. Amendment 7 created a program for reviewing the program annually and making changes to the regulations through the framework adjustment process to insure that the plan goals would be met continually.

**Framework adjustments and interim rule:** The Council has held three annual reviews and made seven adjustments to the FMP to address Amendment 7 rebuilding needs (Frameworks 20, 24, 25, 26, 27, 30 and 31). In 1999, the Council submitted Framework 27 as the primary annual adjustment framework. At the final framework meeting on January 27-28, the Council focused on the finalizing the severe restrictions necessary to achieve the plan objectives for GOM cod and was unable to complete development of the measures needed for GB cod. It followed immediately with the development of Framework 30 to address GB cod, which it submitted to NMFS on April 30.

Both Frameworks 27 and 30 contained cod trip limits, for GOM and GB cod, respectively. In both cases, the Regional Administrator was authorized to reduce the trip limit, when 75 percent of the target TAC for each stock was reached. On May 28, 1999, the Regional Administrator reduced the GOM cod limit implemented on May 1, 1999 of 200 pounds per day to 30 pounds per day, just three weeks into the fishing year. However, even before the trip limit was reduced, fishermen reported excessive discards of cod as seasonal closures ended.

On May 28, 1999, responding to widespread reports from the industry about the levels of cod discards in the western Gulf of Maine, the Council requested that the Secretary of Commerce increase the trip limit under the emergency action authority provided in §305 of the Magnuson-Stevens Act. On August 3, NMFS published an interim rule that increased the trip limit from 30 pounds per day to 100 pounds per day, with a maximum possession limit of 500 pounds and modifications to the running clock. The interim rule expires on January 30, 2000.

NMFS announced on July 29, 1999 that it disapproved the 30-day closure on Georges Bank proposed in Framework 30, but it approved the trip limit which took effect on August 15. Under Framework 30 there is a GB cod trip limit of 2,000 pounds per day/20,000 pounds maximum possession limit that the Regional Administrator may reduce when 75 percent of the target TAC is landed.

To address potential discarding in the GOM cod fishery upon expiration of the interim rule, and to prevent repeating on Georges Bank the discarding situation that occurred in

the Gulf of Maine when the trip limit was reduced, the Council submitted Framework 31 on October 14, 1999. NMFS approved the increased GOM cod trip limit on January 5, 2000, but it disapproved the change to the GB cod trip limit program that would have eliminated the authority of the Regional Administrator to make mid-season adjustments to the trip limit when 75 percent of the target TAC is reached.

### **1.2.2 Stock status and scientific advice**

The last full stock assessment of the five principal stocks was SAW 27. Results were presented to the Council in August, 1998. The SAW's Northern Demersal Working Group held an inter-sessional meeting in July, 1999 and prepared updated assessments, with data through 1998, for 11 groundfish stocks, including GOM and GB cod, GOM haddock, GB and SNE yellowtail flounder. The Council reviewed the updated assessment on August 10, 1999, and the report was provided to the Multispecies Monitoring Committee (MSMC). The updated assessments formed the technical basis for the MSMC annual report and the measures in this framework adjustment.

#### **1.2.2.1 Updated Assessment For 1999**

The updated assessment report is summarized in Appendix II.

#### **1.2.2.2 Multispecies Monitoring Committee Report (November, 1999)**

The Council established the MSMC in Amendment 7 to annually review the rebuilding plan, identify options as needed to achieve plan goals, and to set annual TACs for the five focus stocks of cod, haddock and yellowtail flounder. The timetable for implementing measures to be effective at the start of the fishing year requires that the MSMC meet in the fall and project the impacts of measures in the current fishing year based on data for the first four months of the fishing year. The MSMC presented its report to the Council on November 16, 1999. The report is included as Appendix III. Excerpts from the Executive Summary follow:

**DAS usage in 1998:** DAS usage in 1998 increased to 52,025 in 1998, an 8% increase from 1997 and a 19% increase from the MSMC's prediction of 43,854. As in previous years, DAS greatly exceeded the actual usage in those years. In general, vessels with individual days-at-sea used 90% of their allocation while fleet category vessels used only 44% in fishing year 1998. Based on fishing year 1998 utilization rates, days-at-sea limits in 1998 are more constraining on individual vessels than fleet vessels. Utilization of DAS usage May-August 1999 is similar to utilization in May-August 1998.

**Status relative to Amendment 7 objectives for 5 critical stocks:** The Multispecies Monitoring Committee (MSMC) utilized assessment updates and projections provided by the NDWG to estimate TACs for Georges Bank cod, Georges Bank haddock, Georges Bank yellowtail, Southern New England yellowtail and Gulf of Maine cod in 2000 based on Amendment 7 target fishing mortality. Stock status has improved for the three Georges Bank stocks and Southern New England yellowtail. Calendar year 1998 fishing mortality rates are below the overfishing definitions for these stocks and below the more restrictive Amendment 7 targets for all but Georges Bank cod. The fishing mortality rate on Georges Bank cod increased slightly to 0.26 in calendar year 1998. Spawning stock

biomass has increased for these stocks but, with the exception of Georges Bank yellowtail, remains below the Amendment 7 biomass goals. In general, recruitment (incoming year classes) is below the long-term average with the exception of Georges Bank yellowtail.

Stock status in 1998 for Gulf of Maine cod is similar to stock status in 1997. The fishing mortality rate is projected to decreased slightly to 0.64 in 1998, and remains well above both the overfishing definition ( $F_{20\%}=0.37$ ) and the Amendment 7 mortality target ( $F_{Max}=0.27$ ). Recruitment is at record low levels and spawning stock biomass declined in 1998 to the lowest level ever observed. However, the reduction was not as large as the 37% predicted in the 1998 MSMC report. A sensitivity analysis suggests that if discarding did not appreciably increase in 1999, then the fishing mortality rate on Gulf of Maine cod may be approaching  $F_{MAX}$ . However, given record low spawning stock biomass, poor recent recruitment and decline in the survival ratios (recruit/ spawning stock biomass), **the Amendment 7 objective of  $F_{max}$  remains inappropriate for rebuilding Gulf of Maine cod.**

Target total allowable catches (TACs) were calculated for calendar year 2000 (January 1 2000 to December 31, 2000) based on MSMC projected stock sizes for January 1, 2000 and target fishing mortality rates. These target TACs are assumed to be the target TACs for the fishing year (May 1, 2000 to April 30, 2001). The USA TACs assume that the 1999 Canadian quota for the three Georges Bank stocks (GB cod, GB haddock and GB yellowtail) will be carried over in 2000. The assumed Canadian quota was subtracted from the Total TACs for transboundary stocks to obtain the USA target TAC. USA Target TACs are found in Table 1.

Stock	1998 Landings (metric tons)	TAC		
		1998	1999	2000
GB cod	6959	4700	5354	4145
GB Haddock	1841	4797	5600	6252
GB yellowtail	1800	2145	2725	4618
SNE yellowtail	369	814	1115	951
GOM cod ( $F_{max}$ )	4156	1783	1340	1918
GOM cod ( $F_{0.1}$ )	NA	NA	782	1118

**Table 1 1998 calendar year landings and 1998-2000 TACs (calendar year applied to the fishing year). USA TACs in 2000 assume Canadian quota of 1,900 mt (GB cod), 3,900 mt (GB haddock) and 2,000 mt (GB yellowtail) in 2000 based on 1999 quotas.**

Fishing mortality needs to be reduced on Georges Bank cod (36%) and Gulf of Maine cod (56.2%) from the calendar year 1998 fishing mortality rates to achieve Amendment 7 target fishing mortality rates.

**Fishing mortality reductions needed to achieve Amendment 9 rebuilding objectives:** The MSMC examined projections for achieving Amendment 9 rebuilding targets for Georges Bank cod, Georges Bank haddock, Georges Bank yellowtail, Southern New England yellowtail, and Gulf of Maine cod. Two sets of target fishing mortality were used:

the fishing mortality rate derived from the literal interpretation of Amendment 9 control rule ( $F_{\text{control rule}}$ ) and fishing mortality rate that achieves rebuilding to  $B_{\text{msy}}$  within the Amendment 9 specified time schedule ( $F_{\text{MSMC}}$ ). Substantial reductions from 1998's fishing mortality are needed to achieve rebuilding within Amendment 9 timeframe for all stocks but Georges Bank yellowtail. Mean percent change in mortality (averages both positive and negative changes) is -21%. Mean reduction (average of all stocks needing reductions) is -57% to achieve  $F_{\text{MSMC}}$  and -78% to achieve  $F_{\text{control rule}}$  for these five stocks. The Amendment 7 fishing mortality targets do not achieve rebuilding within the Amendment 9 rebuilding schedule for Georges Bank haddock, Southern New England yellowtail and Gulf of Maine cod.

The MSMC utilized assessment updates and projections provided by the NDWG to estimate TTAC in 2000 for white hake, American plaice, witch flounder, Georges Bank winter flounder, Southern New England winter flounder and Cape Cod yellowtail based on Amendment 9 control rules. Substantial reductions from 1998's fishing mortality are needed to achieve rebuilding within Amendment 9 (mean percent change in mortality is -48% to achieve  $F_{\text{MSMC}}$  and -71% to achieve  $F_{\text{control rule}}$ ; a mean reduction of -78% is needed to achieve  $F_{\text{MSMC}}$  and -89% is needed to achieve  $F_{\text{control rule}}$ ) for these six stocks. Of the 11 stocks examined, 9 out of 11 need reductions to achieve  $F_{\text{control rule}}$  and 8 out of 11 need reductions in fishing mortality to achieve  $F_{\text{MSMC}}$ .

**Reductions from 1998 landings to 2000 TTAC needed to achieve target fishing mortality rates for 11 stocks:** The landings corresponding to the Amendment 9 target fishing mortality rates in 2000 are well below 1998 landings for most species. Despite a large increase in the 2000 Georges Bank yellowtail TTAC, the % change from 1998 landings to 2000 TTAC's for 11 stocks combined is -19% ( $F_{\text{control rule}}$ ) to -36% ( $F_{\text{MSMC}}$ ). The 2000 TTAC is less than 1998 landings for 9 out of 11 species to achieve  $F_{\text{control rule}}$  and 8 out of 11 to achieve  $F_{\text{MSMC}}$ . Major reductions are needed for species in the Gulf of Maine, Georges Bank and Southern New England.

**Status of other stocks without updated assessments or projections:** Status of pollock, redfish, Gulf of Maine winter flounder, SNE/ MA windowpane flounder was updated through calendar year 1998 using research trawl survey indices, commercial landings and a relative exploitation index. Survey biomass is low for pollock and Southern New England windowpane and medium for redfish, Gulf of Maine winter flounder and Gulf of Maine/Georges Bank windowpane. The MSMC notes a downward trend in relative exploitation for these five species, but cautions that relative exploitation does not correlate directly with the magnitude of fishing mortality. Fishing mortality rates may be either above or below Amendment 9 target rates.

The following tables summarize the MSMC Report on stock status.

Table 5.3. Fishing mortality rates for 5 major stocks of groundfish along with target mortality rates. GB= Georges Bank, SNE= Southern New England GOM= Gulf of Maine, yt=yellowtail, hdk= haddock.  $F_{1997}$ ,  $F_{1998}$  and biological reference points estimated from the NDWG assessments.

	<u>GB cod</u>	<u>GB hdk</u>	<u>GB yt</u>	<u>SNE yt</u>	<u>GOM cod</u>
$F_{1997}$	0.53	0.12	0.26	0.36	0.82
$F_{1998}$	0.28	0.15	0.17	0.20	0.64
Projected $F_{1999}$	0.28	0.15	0.17	0.20	0.64
Target $F_{2000}$	0.18	0.26	0.25	0.27	0.29
Overfishing $F^1$	0.41	0.45	0.69	0.94	0.41

<sup>1</sup>Amendment 7 overfishing definitions

Table 5.4. Spawning stock biomass (000's metric tons) for 5 major stocks of groundfish. Projected SSB 1999 values assume achieving 1998 target F. GB=Georges Bank, SNE= Southern New England, GOM= Gulf of Maine, hdk= haddock, yt= yellowtail, SSB= spawning stock biomass.  $SSB_{1997}$  and  $SSB_{1998}$  values are from NDWG assessments.

	<u>GB cod</u>	<u>GB hdk</u>	<u>GB yt</u>	<u>SNE yt</u>	<u>GOM cod</u>
$SSB_{1997}$	26.4	34.6	13.1	1.7	9.9
$SSB_{1998}$	28.7	38.1	17.3	3.6	8.2
projected $SSB_{1999}$	32.5	44.7	28.0	5.5	8.8
Threshold	70.0	80.0	10.0	10.0	n/a
1999 SSB as %threshold	46%	56%	280%	55%	n/a
Projected $SSB_{2000}$	35.8	55.0	36.0	6.1	9.9
Mean SSB (years)	58.3 (78-98)	48.0 (63-98)	7.6 (73-98)	7.0 (73-98)	15.5 (82-98)

Table 5.5. Recent recruitment (millions) for Georges Bank cod, Georges Bank haddock and Gulf of Maine cod compared to long term means and medians.

Year class	GB cod (Age 1)	GB haddock (Age 1)	GB yt (Age 1)	SNE yt (Age 1)	GOM cod (Age 2)
1994	4.2	8.9	26.6	3.0	2.4
1995	7.6	8.2	19.2	4.3	1.6
1996	8.6	14.9	37.8	12.2	1.8
1997	2.3	8.3	79.5	7.6	x.x
Mean (94-97)	5.7	10.1	40.8	6.8	1.9
Longterm Mean	16.6	31.4	26.0	26.8	5.3
Median year classes	15.7 (77-97)	8.7 (62-97)	20.5 (72-97)	14.3 (72-96)	4.5 (80-96)

Table 5.6. Projected 2000 US target TACs in 000's of metric tons for Georges Bank cod, Georges Bank haddock, Georges yellowtail, Southern New England yellowtail and Gulf of Maine cod based on Amendment 7 mortality targets. US TACs assume that the 2000 Canadian quota will equal the 1999 Canadian quota for GB cod, haddock and GB yellowtail. n/a= not applicable.

	GB cod	GB hdk	GB yt	SNE yt	GOM Cod
1998 US landings	7.0	1.8	1.8	0.4	4.1
2000 Target TAC (entire stock)	6.0	10.1	6.6	1.0	1.9
Assumed 2000 Canadian quota	1.9	3.9	2.0	n/a	n/a
2000 US TTAC	4.1	6.3	4.6	1.0	1.9*
Mean US landings	22.8	11.9	5.4	3.9	9.9
Metric tons (years)	(78-98)	(63-98)	(73-98)	(73-98)	(82-98)

\*Target TAC for GOM cod is 1,118 metric tons based on  $F_{0.1}$  target mortality rate.

**Table 5.8. Most recent assessments for 10 principle groundfish**

species. Stock area abbreviations are SNE= Southern New England, GOM= Gulf of Maine, MA= Mid-Atlantic. N/a= not applicable. \* = formal assessment does not exist or terminal year is earlier than 1990 and data are from the Status of Fishery Resources of the Northeastern United States for 1993.

Stock	Source	Assessment Type	Terminal year	Terminal Year F	Overfishing F <sup>1</sup>	Status <sup>2</sup>	
						Biomass	exploitation
GOM-GB white hake	SAW 28	VPA	1997	1.15	F <sub>MSY</sub> = 0.27	Low	overexploited
American plaice	SAW 28	VPA	1997	0.47	F <sub>MSY</sub> = 0.19	Low	overexploited
GOM-GB witch fld	SAW 29	VPA	1998	0.37	F <sub>MSY</sub> = 0.11	Near B <sub>MSY</sub>	Near F <sub>MSY</sub>
GB winter flounder	SAW 28	VPA	1997	0.41	F <sup>4</sup> = 1.12	Low	fully exploited
SNE -MA winter fld	SAW 28	VPA	1997	0.31	F <sub>MSY</sub> <sup>3</sup> = 0.59	Medium	fully exploited
Cape Cod yellowtail fld	SAW 28	VPA	1997	0.44	F <sub>MSY</sub> = 0.54	Medium	overexploited
Pollock	SAW 16	VPA	1992	0.72	F <sub>20%</sub> = 0.65	Medium	fully exploited
GOM-GB redfish	SAW 15	VPA/ index	1992	<0.06	F <sub>20%</sub> = 0.12	Low	overexploited
GOM winter flounder	SAW 21	Index	1994	1.20	unknown <sup>2</sup>	Low	overexploited
GOM-GB windowpane fld	*	Index	1992	unknown	unknown	Med-low	likely overexploited
SNE-MA windowpane fld	*	Index	1992	unknown	unknown	Low	overexploited

<sup>1</sup> Amendment 9 overfishing definitions for all stocks except pollock and GOM-GB redfish, which have Amendment 7 definitions. Overfishing definition and terminal F for witch flounder is biomass weighted, all others are scaled to fully recruited F.

<sup>2</sup> Status at the time of the assessment. SAW 28 status taken from Draft Advisory Report.

<sup>3</sup> The ASMFC plan has a rebuilding target of F40% for SNE-MA (F40%= 0.21) and Gulf of Maine (F40%=0.49) winter flounder stocks.

<sup>4</sup> The proxy for F<sub>msy</sub> is an exploitation index (landings/autumn NEFSC index). Amendment 7 overfishing definition was F<sub>20%</sub>=.47.

## **2. Purpose and need**

### **2.1 Need for the adjustment**

The purpose of this action is to reduce or maintain the fishing mortality rates of the five critical stocks below rebuilding targets established by Amendment 7 ( $F_{0.1}$  for GB cod, haddock and yellowtail flounder and SNE yellowtail flounder, and  $F_{max}$  for GOM cod). As summarized in the previous section, both GB and GOM cod stocks require additional measures to achieve the plan rebuilding objectives. The MSMC Report indicated that fishing mortality needs to be reduced on GB cod by 36 percent and GOM cod by 56 percent from the calendar year 1998 levels to achieve Amendment 7 targets. The proposed action includes measures to achieve those reductions in fishing year 2000, considering the effect of measures that have been implemented in 1999.

### **2.2 Publication as a final rule**

The Council recommends that NMFS publish the proposed adjustments as a final rule, and it has considered the following factors as specified in 50 CFR 648.90 (b) in making this recommendation:

1. timing of the rule
2. opportunity for public comment
3. need for immediate resource protection, and
4. continuing evaluation of the plan.

#### **2.2.1 Timing of the rule**

The timing of the rule is relevant to the start of the fishing year on May 1, and to the urgent need to implement management measures for the cod stocks without delay. The Council is proposing measures for both Georges Bank and Gulf of Maine cod stocks that would be effective on May 1. Based on the amount of time NMFS requires to review the framework document to determine that the proposed action meets the FMP objectives and is consistent with other applicable law, publication as a proposed rule would delay the effectiveness of the measures beyond the start of the fishing year. The Council is concerned that any delay in the effectiveness of the measures to manage GOM and GB cod fisheries would result in a stock decline.

The timing of the rule does not depend on the availability of time-critical data, and the Council did not consider data availability in its decision to recommend publishing the adjustments as a final rule.

#### **2.2.2 Opportunity for public comment**

The Framework 33 development process formally started with the November 16-19, 1999 Council meeting when the Council received the MSMC Report and initiated the framework adjustment. Prior to that meeting, however, the Council had requested industry proposals based on the information contained in the updated stock assessments presented in August. Furthermore, the plan adjustment process has been ongoing this past fishing year, specifically with Frameworks 29, 30, and 31 and the public has been informed, and had opportunity to comment throughout the

evolution of the current plan. Prior to the November meeting, the Council solicited proposals from the industry, through a mailing to all interested parties, for consideration in this annual adjustment framework.

The schedule of meetings for which the public notice included discussion of specific alternatives for this framework is as follows:

DATE	MEETING	AGENDA/DISCUSSION
11/10/99	GF Committee and Advisory Panel	<ul style="list-style-type: none"> <li>• Preliminary review of the MSMC Report, develop recommendations to the Council for consideration in Framework 33</li> </ul>
11/16-19/99	Council	<ul style="list-style-type: none"> <li>• Initial meeting for Framework 33</li> <li>• Report of the MSMC</li> <li>• Review of 1999 SAFE Report, including industry proposals for 2000 fishing year</li> </ul>
12/13/99	GF Committee and Advisory Panel	<ul style="list-style-type: none"> <li>• Develop options, as needed, for recreational fishery, scallop vessel access to closed areas, and exemptions to closed areas</li> </ul>
1/13/00	Advisory Panel	<ul style="list-style-type: none"> <li>• Review draft framework document, recommend preferred alternatives to the GF Committee</li> </ul>
1/14/00	GF Committee	<ul style="list-style-type: none"> <li>• Review draft framework document, recommend preferred alternative to the Council</li> </ul>
1/18-20	Council	<ul style="list-style-type: none"> <li>• Final meeting for Framework 33</li> </ul>

The mailing lists for meeting notices contain approximately 900 and 1,600 interested parties for Groundfish Committee and Council meetings, respectively. Notices are mailed at least two weeks in advance of committee meetings and three weeks in advance of Council meetings. Council meeting notices are also published in the *Federal Register* three weeks ahead of the meeting. Agendas and meeting summaries for the above meetings are available from the Council office.

### 2.2.3 Need for immediate resource protection

Sections 1.2.2 and 2.1 summarize the most recent information available for the groundfish stocks, particularly GOM and GB cod. The fishing mortality rates on GOM and GB cod have declined in recent years but are above or near target levels. Recruitment and survival of pre-recruits remains poor. If plan objectives are not met as soon as possible, rebuilding will be delayed and there is an increased chance of stock decline in the near term, resulting in additional restrictions on the fishing industry being necessary. These stocks, as well as GB haddock and SNE yellowtail flounder remain well below the biomass levels required to support maximum sustainable yield.

### 2.2.4 Continuing evaluation

The regulations require the Council to review the plan annually and make adjustments as necessary to insure that the rebuilding goals are being met (50 CFR 648.90 (a)). The Council is proposing this framework adjustment in accordance with that requirement. Both the Council and NMFS continually monitor catch, effort and resource information and may address problems as

needed any time during the year using the framework adjustment procedure. During the upcoming year, the Council will prepare a Draft Environmental Impact Statement, and hold public hearings on proposals for Amendment 13 to implement stock rebuilding programs for all overfished multispecies stocks and to address other matters.

### 3. PROPOSED ACTION AND ALTERNATIVES

The Council is considering the following options for submission in this framework. Area closure measures reference block numbers in Figure 1.

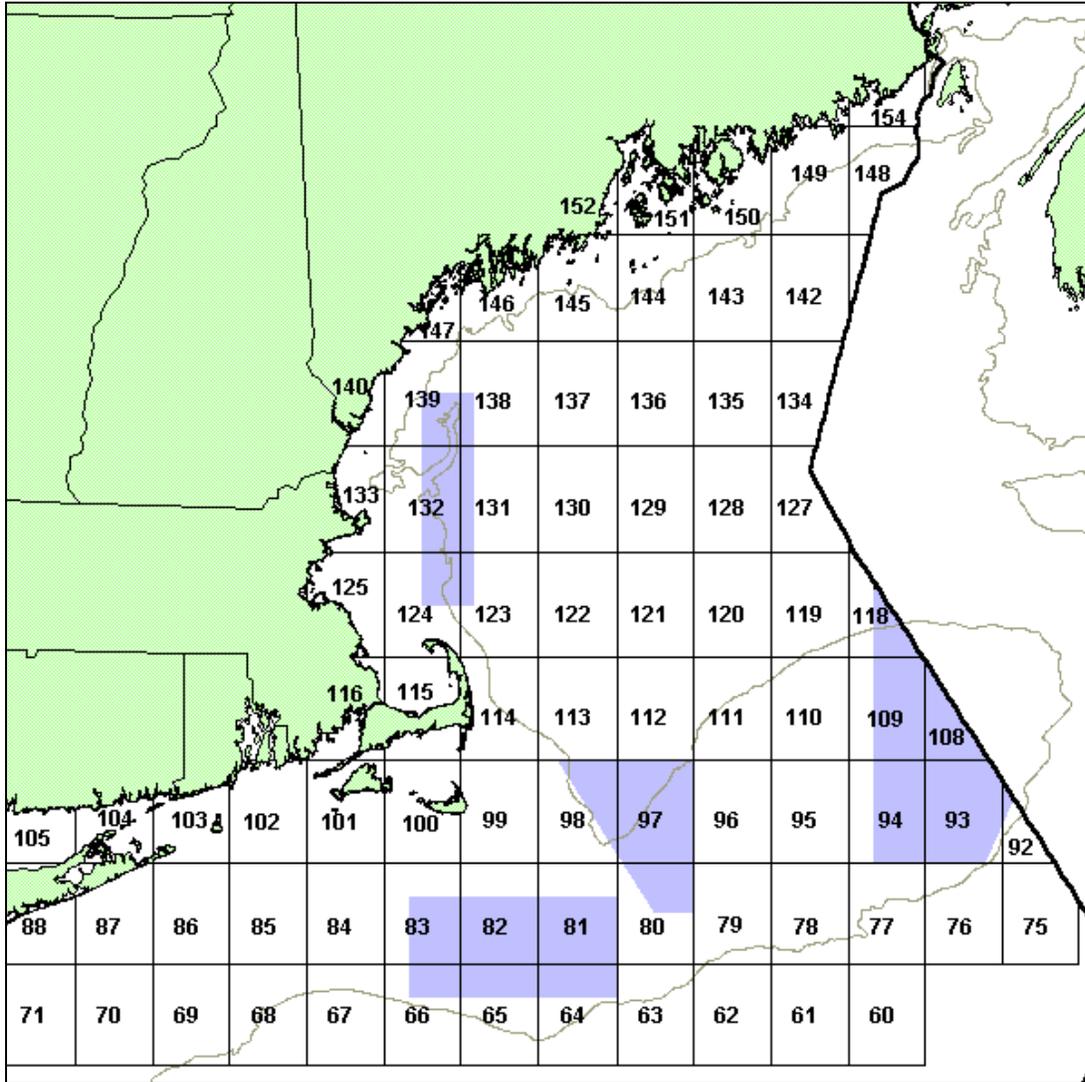


Figure 1 Area closure block reference map

## 3.1 Proposed action

### 3.1.1 Gulf of Maine cod measures

#### 3.1.1.1 GOM cod area closures and trip limit (Option 2)

**Area closures:** Status quo area closures as contained in Frameworks 27 and 31. These area closures would remain in effect until modified by future Council action. The Western GOM Closed Area, currently scheduled to end on April 30, 2001, would be extended for one additional year (expiring on April 30, 2002). Area closures are shown in Figure 2. The Council is also proposing a backstop provision if 50 percent of the target TAC, (at 759 metric tons based on the average between the  $F_{0.1}$  target TAC and the  $F_{max}$  target TAC) is landed by July 31. If the contingency is met and the backstop measures are triggered, Cashes Ledge Closed Area will remain closed for one additional month (November) and Blocks 124 and 125 will close in January (see Figure 1 and Figure 2).

**Trip Limit:** Status quo trip limit as contained in Framework 31: 400 lbs./day with a maximum possession limit equal to ten times the daily limit (i.e. 4,000 pounds). Vessels may land a limited overage of cod as follows:

- Vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program are limited to 400 pounds for each day or part of a day on the trip. On trips under 24 hours a vessel may not land more than 400 pounds of cod, and may not land cod again until 24 hours have elapsed from the start of the prior trip, although the vessel may call-out of the DAS program before 24 hours have elapsed. On trips longer than 24 hours, a vessel may land 400 pounds of cod for each full day (24 hours) of the trip and 400 pounds for any part of a 24-hour period, provided it does not call out of the DAS program until the remainder of that 24-hour period has elapsed. A vessel on a trip longer than 24 hours and landing up to 400 pounds of cod for any part of a (24-hour) day, must call the hail line to report the overage and may not leave port or call out of the DAS program for the remaining part of the 24 hours.
- a vessel may not land more than 4,000 pounds, even if the trip duration exceeds ten days.

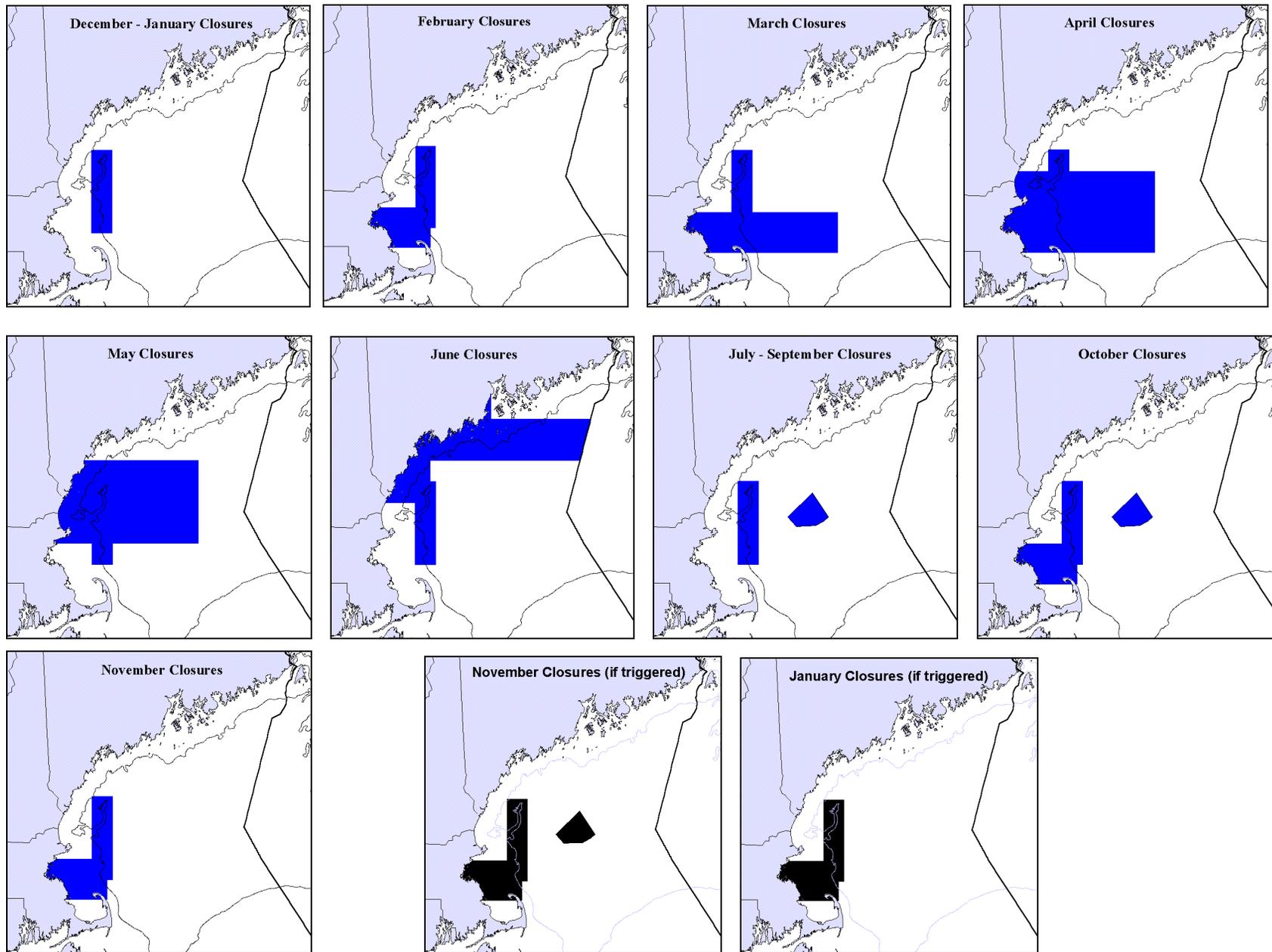
**Discussion:** This option is based primarily on the current management program, which the analysis indicates may be achieving the  $F_{max}$  target in 1999. The analysis, however, does not account for the potential effect of increased discard rates when the trip limit was 200, 30 or 100 pounds per day during the 1999 fishing year. With the increased trip limit of 400 pounds per day and the possible additional closures, the proposed action will reduce the uncertainty about actual catches and will provide a backstop to prevent exceeding the TAC.

Of the four GOM options under consideration, this option provides the greatest protection to right whales and harbor porpoise. This option would provide some benefit to essential fish habitat by lengthening the recovery time of habitat within the Western Gulf of Maine Closed Area.

The economic impacts of this option are similar to those in Option 1 (not adopted), although the additional area closures in this option will reduce fleet revenues between \$0.1 million and \$0.6 million, depending on the ability of vessels to recover lost revenues by fishing in open areas. The one-year extension of the Western Gulf of Maine Closed Area will reduce fleet revenues between \$1.8 million and \$7.4 million, depending on the ability of vessels to fish in other areas. This estimate does not consider that if this area were opened May 1, 2001 as currently scheduled, other restrictions on catch and effort would be needed to provide an equivalent cod conservation in order to meet GOM cod fishing mortality objectives.

The following table compares landings through October in 1998 and 1999. During the January – April, 1999 period vessels operated under a 400-pound per day trip limit with no maximum limit and no restrictions on the use of the running clock as well as the Framework 26 area closures. Preliminary NMFS landings data indicate a decline of 59 percent during the January – April period (685 mt compared to 1672 mt) and a decline of 66 percent January - October. Since there are no reliable estimates of discards under the 200-, 30-, and 100-pound trip limits during May through October, 1999, caution should be used to compare landings during this period. One important difference between the 400 pounds per day limit before May, 1999 and that proposed for this action is the change to the running clock, which will significantly minimize the incentive to target cod. According to the VTR data about 40 percent of the landings of GOM cod during February through April 1999, under the 400 pounds per day trip limit and the unrestricted running clock, were on trips that exceeded the per-day limit, and about 23 percent of GOM cod landings were overages (in excess of the allowed limit) during that period.

<b>GOM cod Landings (mt)</b>	<b>Jan-Apr</b>	<b>May</b>	<b>June</b>	<b>July</b>	<b>August</b>	<b>Sept.</b>	<b>Oct.</b>	<b>January-October</b>
<b>1998</b>	1,672	620	536	202	154	178	194	3,556
<b>1999</b>	685	267	64	53	53	46	44	1212



**Figure 2 Area closures – Option 1 (alternative considered but not adopted) and Option 2. The proposed action continues the area closures in Frameworks 27 and 31. Additional closures would be triggered if 759 mt of cod is landed by July 31.**

### **3.1.2 Party/charter access to GOM closed areas**

The Council proposes to require party and charter vessels to obtain an exemption certificate from NMFS to fish in any of the Gulf of Maine closed areas. A limited access vessel in the exemption program would be prohibited from fishing on a DAS while in possession of the certificate. A vessel would obtain a certificate and remain enrolled in the exemption program for a minimum of three months. The validity of the exemption certificate is contingent on meeting the requirements of party/charter vessels, such as the prohibition on sale of fish and minimum fish size.

**Discussion:** The Council considered three options within this proposal to control party/charter access to closed areas. In addition to the proposed three-month enrollment, it considered six-month and one-year enrollment programs. Under each of the various scenarios analyzed, the expected number of recreational passengers in the Gulf of Maine is close to the 1998 baseline.

Five three-month alternatives that were analyzed produce results (in terms of anglers and expected cod catch) that are all very similar to the baseline. The analysis projects very little difference between the baseline and any of the three-month alternative in terms of expected numbers of passengers and numbers of cod kept. The three-month alternatives can be assumed to have no biological impact on the stocks and minimal economic impact on vessels.

One of the most significant benefits of this provision will be better recreational party/charter fishing information for the Gulf of Maine. The Council wants to improve its understanding of what kind and how much recreational fishing activity occurs in the Gulf of Maine closed areas. The exemption certification program should allow NMFS and the Council to document how many and which party/charter vessels fish in the closed areas and when. A second important benefit is that vessels that are found in violation of the party/charter restrictions during the enrollment period, particularly the minimum fish size and prohibition on sale of fish, could lose their certificate. The proposed action will also provide the greatest flexibility for limited-access vessels to engage in both party/charter and commercial fishing on a seasonal basis.

### **3.2 Party/charter DAS usage prohibition**

This proposal would eliminate the current provision that enables limited access vessels to fish under DAS (and other regulations applicable to commercial vessels) while taking passengers for hire, rather than fishing under the party/charter regulations (for example, larger minimum fish size, no-sale provision and gear restrictions). This would apply to all limited access vessels that also take passengers for hire, regardless of whether they obtain a certificate to fish in the closed areas as proposed in the previous section.

**Discussion:** This option would close a perceived “loophole” in the regulations that allows party/charter vessels that possess a limited access permit to fish for regulated species with the lower minimum fish size that applies on commercial vessels, and to sell their catch. Party/charter vessels that do not have limited access permits do not have this option.

### 3.3 GB cod measures

#### 3.3.1 GB cod trip limit

The Council proposes to retain the status quo 2,000 pounds per day, or part of a day; 20,000 pounds maximum possession limit. This proposal, however, would eliminate the authority of the Regional Administrator to reduce the trip limit to prevent exceeding the TAC.

**Discussion:** The 2,000 pounds per day trip limit has only been in effect since August 15, 1999, and it is the first GB cod trip limit that the Council has implemented. Consequently, insufficient data is available at this time to measure its effectiveness. The Council proposed in Framework 31 eliminating the authority of the Regional Administrator to reduce the trip limit on the recommendation of the PDT that reducing the trip limit may not reduce fishing mortality if landings are merely replaced by discards. On December 30, 1999, NMFS announced that it had disapproved this proposal in Framework 31. NMFS stated that “removal of this ‘backstop’ in order to reduce the risk of discards without any compensating conservation measures to address fishing mortality is not justified”. The Council now proposes to implement an area closure (see following section) to replace the trip limit adjustment. The PDT analysis indicates the area closure will keep landings near or below the TAC with a 2,000 pounds per day trip limit.

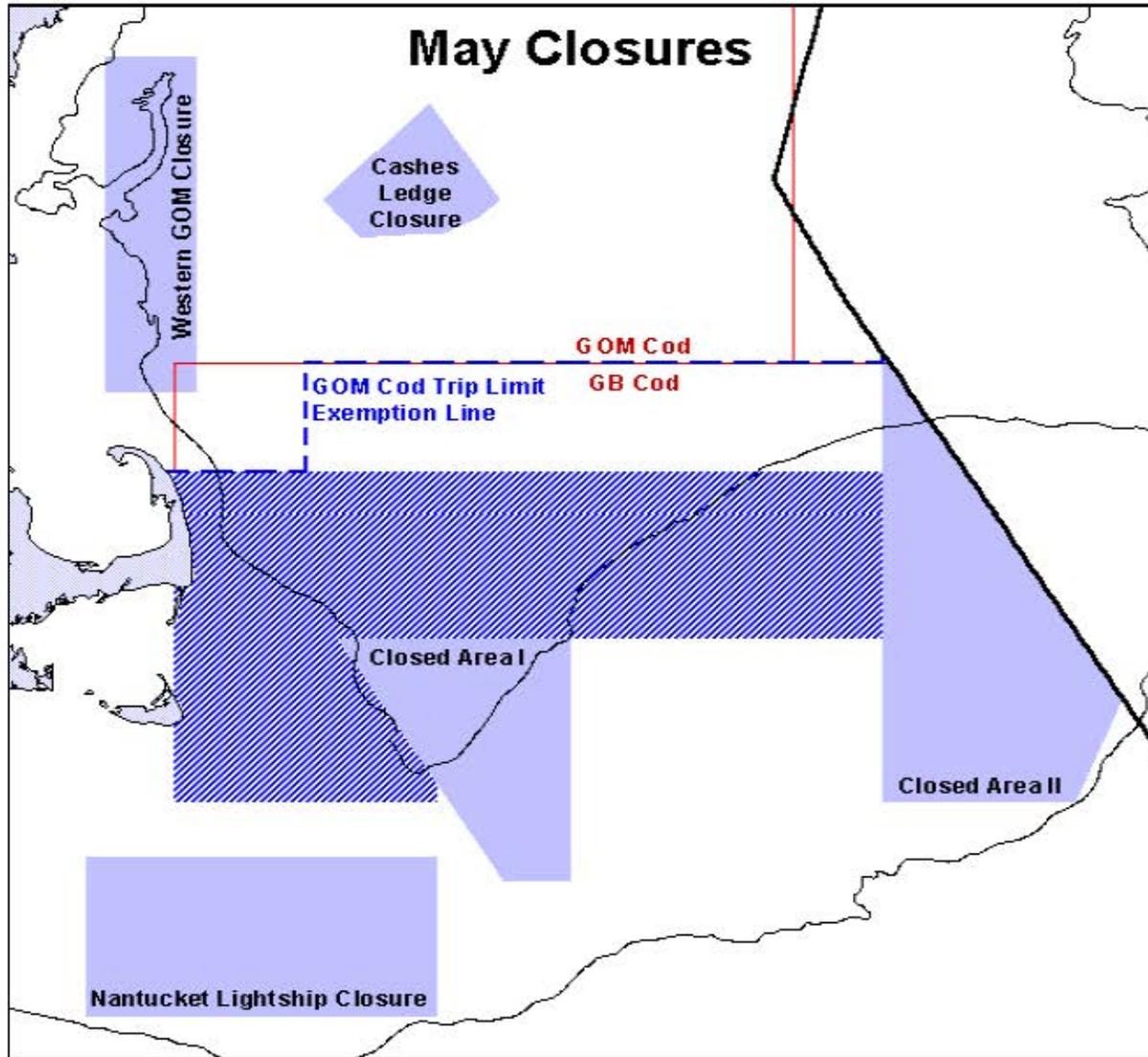
#### 3.3.2 GB cod area closures

The Council considered five area closure options in this framework. It is proposing Option 5 as described below.

##### 3.3.2.1 Closed Area Option 5

This option would close Blocks 109-114, 98 and 99 in May; and if additional closures are needed they will be based on the highest cod catch/month blocks (Figure 3).

**Discussion:** This option originated in the development of Framework 30, but due to the timing of that framework, could not be considered for May as urged by fishermen. The Council proposed, in Framework 30, that it be applied for 30 days upon implementation of the rule, and the framework document contained analysis of both a June and July closure. However, NMFS did not approve the closure because implementation could not occur within the months analyzed in the framework document and because the conservation basis for the closure diminished with time as the spring concentrations of spawning cod disperse. The current proposal, which would take effect during May addresses this issue. The analysis shows that a trip limit of 2,000 pounds per day would exceed the TAC by 64 metric tons, or about 1.5 percent. This option has a slightly higher revenue loss per metric ton of cod saved than Option 1 under the full effort displacement scenario (ranks third highest of five options), but is equivalent to Option 4 as the lowest in terms of total revenue loss.



**Figure 3 GB cod Closed Area Option 5**

### 3.4 Haddock trip limit

The Council proposes the haddock trip limit be set as follows:

- 3,000 pounds per day or part of a day; 30,000 pounds maximum possession limit at the start of the fishing year on May 1
- increases on September 30 to 5,000 pounds per day or part of a day; 50,000 pounds maximum possession limit
- the trip limit adjustment may occur at any other time by notice action if the Regional Administrator determines a different trip limit is needed to achieve at least 75 percent of the TAC, but not exceed the TAC.

**Discussion:** This proposal contains a combination of elements from the two similar options that the Council considered in the final framework meeting. The two options were indistinguishable in a conventional trip limit analysis to predict landings, the primary difference between the two options being the timing of the trip limit increase (two weeks difference) and the mechanism by which it would take effect (Regional Administrator decision or automatic). Neither of these two components will have a measurable impact on the fishing mortality rate from the status quo. The proposed action reduces the potential for discards during the May-September period with a conservation impact approximately equivalent to the status quo.

The MSMC considered that the status of haddock relative to the new overfishing definitions will require a significant reduction in fishing mortality, and recommended against any measure that will allow fishing mortality to increase from the 1998 level. Therefore, the MSMC recommended against any increase in the trip limit for 2000.

### 3.5 Large Mesh Permit category

The Council proposes changing the conditions of the Large Mesh Permit Category as follows:

- the minimum mesh size for otter trawls would be reduced from 8 inches to 7 inches,
- the increased DAS allocated to otter trawl vessels fishing in this category would be reduced from 36 percent to 25 percent, and
- both trawl and gillnet vessels that enroll in this permit category would be able to exit the category after one month. The proportion of DAS used while enrolled in this category would be deducted, on a percentage basis, from the vessel's regular Fleet or Individual DAS allocation.

**Discussion:** Enrollment in this program would be during the permit application period prior to the start of the fishing year. A vessel participating in this program would request a Large Mesh Category Permit and fish under the permit restrictions (minimum mesh size) until it notified NMFS (after a minimum of 30 days) that it was exiting the program and receives a regular Fleet or Individual DAS category permit and pro-rated DAS allocation. For example, if a vessel in the Fleet DAS category (88 DAS) elects to participate in this program, the DAS allocation would be 110 DAS. If the vessel uses 11 DAS during the

first month of the program (10 percent of the allocation) and exits the program, the Fleet DAS remaining available to the vessel would be 79.2 DAS (88 DAS reduced by 10 percent). NMFS will inform vessels exiting the program what the remaining DAS allocation is when it re-issues the (Fleet or Individual DAS) permit.

Currently, a vessel fishing under the Large Mesh Individual DAS category is allocated a 36-percent DAS increase over its base allocation. A vessel fishing under the Large Mesh Fleet DAS category is allocated 120 DAS, compared to 88 DAS. To be eligible to fish under a Large Mesh DAS permit category, a vessel now must enroll in the permit category for the entire fishing year and, while fishing under this category, must fish with gillnet gear with a minimum size of 7-inch (17.78 cm) diamond mesh or with trawl gear with a minimum mesh size of 8-inch (20.32 cm) diamond mesh. No vessels currently participate in the otter trawl large mesh fishery program. The proposed action would provide a reasonable incentive for vessels to use the larger mesh nets, providing both biological benefits (increased yield per recruit and spawning stock biomass per recruit, reduced discards of sublegal sized fish) and allowing for data collection on the catch characteristics of vessels using large mesh under commercial conditions.

### **3.6 Scallop vessel access to Closed Areas I and II and Nantucket Lightship Closed Area**

The Council is submitting the proposed exemption in a separate document combining scallop and groundfish management actions under one cover (Scallop Framework 13 and Multispecies Framework 34).

### **3.7 Alternatives considered and rejected**

The following section describes the measures the Council considered in the draft Framework 33 document but did not adopt. In addition, the Council considered a number of proposals made by individuals in early comment to the Council during the development of this action, five industry proposals submitted in response to the Council's solicitation in October, 1999 and options developed by the MSMC. Some of these proposals evolved into the proposals formally considered by the Council in this framework. The other proposals, those not formally considered in the draft framework document, are contained in the 1999 SAFE Report, available from the Council office, and the MSMC report, Appendix III of this document.

#### **3.7.1 GOM cod management options**

The Council considered four primary options to address Gulf of Maine cod management. It is submitting Option 2 as discussed in Section 3.1.1, with the backstop closure of two areas which would take effect if 50 percent of the target TAC is landed by July 31, and with the status quo counting of DAS. The following table summarizes the options considered by the Council at the final framework meeting on January 19, 2000:

Option /page #	DAS	Area Closures	Trip Limit	Other Measures
1	Status quo except Count first day of a trip as 24 or 15 hrs. off DAS (analyze as status quo also)	Status quo through FW 31; plus one-year extension of WGOM Closed Area	as in FW 31	<b>During May, June, July, Nov. and Dec.:</b> <ul style="list-style-type: none"> <li>Vessels (except Day Gillnet) must take layover days equal to trip length</li> <li>Day Gillnet vessels limited to 80 net tags</li> </ul>
2	Status quo Count first day of a trip as 24 or 15 hrs. off DAS (analyze as status quo also)	Status quo through FW 31; plus one-year extension of WGOM Closed Area	as in FW 31	<b>a)</b> Closures, if 50% of TAC landed by July 31: Cashes Ledge CA (Nov.) Blocks 124 & 125 (Jan.); or <b>b)</b> close the northern half of Block 124 year-round, (no trigger)
3	Status quo	See Attachment 2 except close northern half of Block 124 Mar.- Aug. (no year-round Stellwagen Bank Closed Areas) plus FW25 1-month rolling closures	400 lbs, w/ running clock, and 2-day layover; or as in FW 31	Increase cod minimum size to 21 inches
4	Status quo, except limit of 25 DAS or call in/out cycles in WGOM Restricted gear Area Feb. – May (enrollment program)	See Attachment 2 plus FW25 1-month rolling closures; Feb-May also apply to party/charter vessels; Cashes Ledge Closed Area year-round	400 lbs, w/ running clock, and 2-day layover; except no running clock/layover Feb-May	

**Table 2. Summary of Gulf of Maine cod options for 2000 fishing year. FW=Framework; GOM=Gulf of Maine. Maps of Options 1 and 2 closures are in Figure 2, Map of Option 3 and 4 closures is in Figure 4.**

**Table 2. Summary of Pros and Cons of GOM Options 1-4**

Option	Pros	Cons
1	<ul style="list-style-type: none"> <li>• May achieve <math>F_{MAX}</math> for Gulf of Maine cod</li> <li>• Reduces “pulse fishing” after opening of rolling closures when catch rates are highest</li> <li>• Counts per-day trip limits as per-DAS, if first day of a trip is counted as 24 hours</li> <li>• Economic analysis shows no change from status quo for continuing current area closures and trip limits</li> <li>• Options 1 and 2 provided the greatest protection to right whales and encompass most harbor porpoise sighting area</li> <li>• Extension of WGOM for one year would benefit habitat</li> <li>• Continues current management plan with minor modification</li> </ul>	<ul style="list-style-type: none"> <li>• Does not achieve <math>F_{0.1}</math> for Gulf of Maine cod</li> <li>• May not achieve fishing mortality targets on other regulated species that need rebuilding under Amendment 9</li> <li>• Economic analysis suggests impact of DAS counting uncertain but could be negative, depending on vessels’ response; layover day and gillnet reduction not quantifiable but could have negative economic impact offset by some price stability</li> <li>• Reactivation of latent effort (unused DAS) likely under DAS counting proposals</li> <li>• Layover days are difficult to enforce but NFMS has indicated not opposed to the proposal</li> <li>• Would also limit monkfish nets to 80 tags in some months in the GOM</li> <li>• Negative social impact of DAS counting proposal which affect day vessels in all areas and layover provision which reduce flexibility and alters work patterns</li> </ul>
2	<ul style="list-style-type: none"> <li>• Provides a limited backstop against exceeding the target TAC that does not rely on trip limits</li> <li>• May achieve <math>F_{MAX}</math> for Gulf of Maine cod</li> <li>• Counts per-day trip limits as per-DAS, if first day of a trip is counted as 24 hours</li> <li>• Economic analysis shows no change from status quo for continuing current area closures and trip limits</li> <li>• Options 1 and 2 provided greatest protection to right whales and encompass most harbor porpoise sighting area</li> <li>• Extension of WGOM for one year and expanding to northern half of Block 124 would benefit habitat</li> <li>• Continues current management plan with minor modification</li> </ul>	<ul style="list-style-type: none"> <li>• Does not achieve <math>F_{0.1}</math> for Gulf of Maine cod</li> <li>• May not achieve fishing mortality targets on other regulated species that need rebuilding under Amendment 9</li> <li>• May encourage pulse fishing before reaching the 50 percent threshold</li> <li>• Economic analysis suggests extending WGOM closure for one year and additional area closures will reduce fleet revenues; DAS counting uncertain but could be negative, depending on vessels’ response</li> <li>• Negative social impact of DAS counting proposal which affect day vessels in all areas and backstop which has disproportional effects on vessels that fish in Cashes Ledge and Blocks 124 and 125</li> </ul>

3	<ul style="list-style-type: none"> <li>• Provides opportunity for inshore vessels to fish on other species</li> <li>• Designed to protect sensitive areas and concentrations of cod</li> <li>• Reduces discards and promotes safety by allowing running clock</li> <li>• Combines several industry proposals</li> <li>• Increases cod yield per recruit and SSB per recruit</li> <li>• Disperses inshore effort and spreads out impacts over a wider area</li> <li>• Fleet revenues likely to increase from status quo due to smaller area closures, and overall economic impact expected to be less than Options 1 and 2</li> </ul>	<ul style="list-style-type: none"> <li>• Does not achieve <math>F_{max}</math> for GOM cod; analysis of cod landings indicates TAC will be exceeded</li> <li>• Area closures not compatible with standard analysis data and methods; results not comparable to Options 1 and 2</li> <li>• Increased opportunity to fish on other regulated species will delay rebuilding to comply with SFA</li> <li>• Small, irregularly shaped closed areas are difficult to enforce</li> <li>• Running clock may provide an incentive to target cod and makes monitoring of actual fishing effort used more difficult</li> <li>• Potential increase in cod discards</li> <li>• Min. size increase affects communities outside GOM</li> <li>• Reduce harbor porpoise protection</li> <li>• May increase adverse impact of the fishery on habitat and habitat research in WGOM</li> </ul>
4	<ul style="list-style-type: none"> <li>• Provides opportunity for inshore vessels to fish on other species</li> <li>• Disperses inshore effort over a wider area and spreads out impacts over a wider area, widely supported by some industry sectors</li> <li>• Designed to protect sensitive areas and concentrations of cod</li> <li>• Reduces discards and promotes safety by allowing running clock</li> <li>• Closed area protection of cod extended to party/charter sector during spawning season</li> <li>• Overall economic impact expected to be less than Options 1 and 2, but larger than Option 3</li> </ul>	<ul style="list-style-type: none"> <li>• Does not achieve <math>F_{max}</math> for GOM cod; analysis of cod landings indicates TAC will be exceeded</li> <li>• Area closures not compatible with standard analysis data and methods; results not comparable to Options 1 and 2</li> <li>• Increased opportunity to fish on other regulated species will delay rebuilding to comply with SFA</li> <li>• Small, irregularly shaped closed areas are difficult to enforce</li> <li>• Running clock may provide an incentive to target cod and makes monitoring of actual fishing effort used more difficult</li> <li>• Requires separate DAS tracking for WGOM restricted fishery February – May</li> <li>• Social impact extends to party/charter anglers</li> <li>• Least protection to harbor porpoise and right whales</li> <li>• May increase adverse impact of the fishery on habitat and habitat research in WGOM</li> </ul>

**Table 2 (cont'd.)- Summary of GOM cod Options 1-4.**

### 3.7.1.1 GOM Option 1

**DAS:** Status quo allocation of DAS with one of the following three options for counting DAS:

1. Status quo, DAS counted as actual time between call in and call out
2. Count the first day of a trip as 24 hours
3. Count the first day of a trip as 15 hours

Options 2 and 3 above would work as follows:

- any vessel that calls the DAS line to start a trip may not call out to end the trip until 15 or 24 hours have elapsed
- a vessel that is calling in to end a trip after 15 or 24 hours may also start another trip at that time
- the 15-hour or 24-hour minimum requirement does not apply to vessels that return to port within three hours of starting the trip
- this provision applies to all vessels on a multispecies DAS regardless of species landed.

**Area closures:** Status quo area closures as contained in Frameworks 27 and 31. These area closures would remain in effect until modified by future Council action. The Western GOM Closed Area which is currently scheduled to end on April 30, 2001, would be extended for one additional year (expiring on April 30, 2002). Area closures are shown on Figure 2.

**Trip Limit:** Status quo trip limit as contained in Framework 31: 400 lbs./day with a maximum possession limit equal to ten times the daily limit (i.e. 4,000 pounds). Vessels may land a limited overage of cod as follows:

- Vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program are limited to 400 pounds for each day or part of a day on the trip. On trips under 24 hours a vessel may not land more than 400 pounds of cod, and may not land cod again until 24 hours have elapsed from the start of the prior trip, although the vessel may call-out of the DAS program before 24 hours have elapsed. On trips longer than 24 hours, a vessel may land 400 pounds of cod for each full day (24 hours) of the trip and 400 pounds for any part of a 24-hour period, provided it does not call out of the DAS program until the remainder of that 24-hour period has elapsed. A vessel on a trip longer than 24 hours and landing up to 400 pounds of cod for any part of a (24-hour) day, must call the hail line to report the overage and may not leave port or call out of the DAS program for the remaining part of the 24 hours.
- a vessel may not land more than 4,000 pounds, even if the trip duration exceeds ten days.

**Layover Day Requirement:** During May, June, July, November and December, all vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program, except Day Gillnet vessels, and fishing on a multispecies DAS must remain in port for a period of time

equal to the time of the previous trip but a minimum of 24 hours, measured between call in and call out of the DAS program.

**Day Gillnet Vessels:** During May, June, July, November and December, Day Gillnet vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program will be limited to fishing with 80 net tags (40 stand up nets or 80 flatfish nets, or any combination thereof).

**Discussion:** This option is based on the current management plan, with adjustments to reduce the “pulse” fishing effect that occurs on the re-opening of seasonally closed areas. The adjustment includes a 50-percent reduction, for one month following the re-opening, in the number of gillnets used by Day Gillnet vessels, and a layover day requirement for other vessels. The counting of the first day of a trip as 24 hours was intended to provide some additional conservation of groundfish, particularly those stocks such as GOM cod whose landings by day boats is proportionally larger. The counting of the first day of a trip as 15 hours has less of an impact.

The MSMC provided this option based on its analysis of the landings and effort in 1999. The analysis indicated that GOM cod fishing mortality in 1999 may be near the  $F_{max}$  target, although the analysis does not take into account any additional discarding that may have occurred under the low trip limits in effect. The discarding problem, based on industry comments, appears to be greatest during the period immediately following the re-opening of the rolling closures. This option would address this issue by slowing the rate of fishing effort. Option 1 and 2 would provide the greatest protection to endangered right whales, and encompass the most area in which harbor porpoise have been sighted. This option would not have a significant impact on essential fish habitat. The economic impacts of this option are slightly less than those of Option 2, which has some additional area closures, although the impact of the layover day cannot be quantified at this time.

The Council did not adopt this option primarily because it was concerned about the distribution of impacts, particularly on vessels fishing in the Gulf of Maine that do not catch significant amounts of cod. It was also concerned about the added complexity and enforceability of the layover provision. On the recommendation of the industry advisors and Groundfish Committee, the Council did not adopt the 15-hour and 24-hour counting of the first DAS of the trip because of the minimal conservation impact and the uneven distribution of impacts on some vessel groups. The advisors recommended, however, that the concept of modifying the DAS counting method be developed in Amendment 13.

### 3.7.1.2 GOM cod Option 2

While Option 2 is the proposed action, the Council considered and rejected within this option the same DAS counting alternatives as described in Option 1, above, and an alternative to the triggered backstop closures that would have closed the northern half of Block 124 year-round.

**Discussion:** The Council did not adopt the alternative DAS counting method for reasons discussed under Option 1. The Council also did not adopt the alternative area closure

proposal within this option because it would place the entire additional conservation burden on vessels that fish on Stellwagen Bank. These vessels are already impacted by the rolling closures and the Western Gulf of Maine Closed Area.

### 3.7.1.3 GOM cod Option 3

**DAS:** Status quo

**Area Closures:** In **Figure 4** Area I would be closed year round and Area II would be closed September 15 – November 15. The northern half of Block 124 would be closed March through August (Area III in **Figure 4** would not be closed), or for a longer period if needed. The Cashes Ledge Closed Area would remain as in the current program, July – October. In addition, the one-month rolling closures in effect in the 1998 fishing year (under Framework 25) would be in effect. These are described below:

- One-month rolling closure of areas described in Table 3 below (GM1- March, GM2-April, GM3- May and GM4- June, block numbers reference Figure 1)
- One month closure, June, of block 129

The coordinates of the area closures are as follows:

	<b>AREA I</b>	<b>AREA II (9/15-11/15)</b>	<b>AREA III (Option 4 only)</b>
<b>A</b>	70°15' 44340 (LORAN)	(LORAN) 13740 25790	13820 (LORAN) 42°25'
<b>B</b>	70°00' 44340 (LORAN)	(LORAN) 13650 25790	13750 (LORAN) 42°25'
<b>C</b>	70°00' 43°15'	(LORAN) 13650 25750	13750 (LORAN) 42°15'
<b>D</b>	70°10' 43°15'	(LORAN) 13740 25750	13820 (LORAN) 42°15'
<b>E</b>	70°10' 44385 (LORAN)		
<b>F</b>	70°15' 44385 (LORAN)		
<b>A</b>	70°15' 44340 (LORAN)		

The Northeast Closure Area is described by the following:

Northeast Closure Area

Point N. Latitude W. Longitude

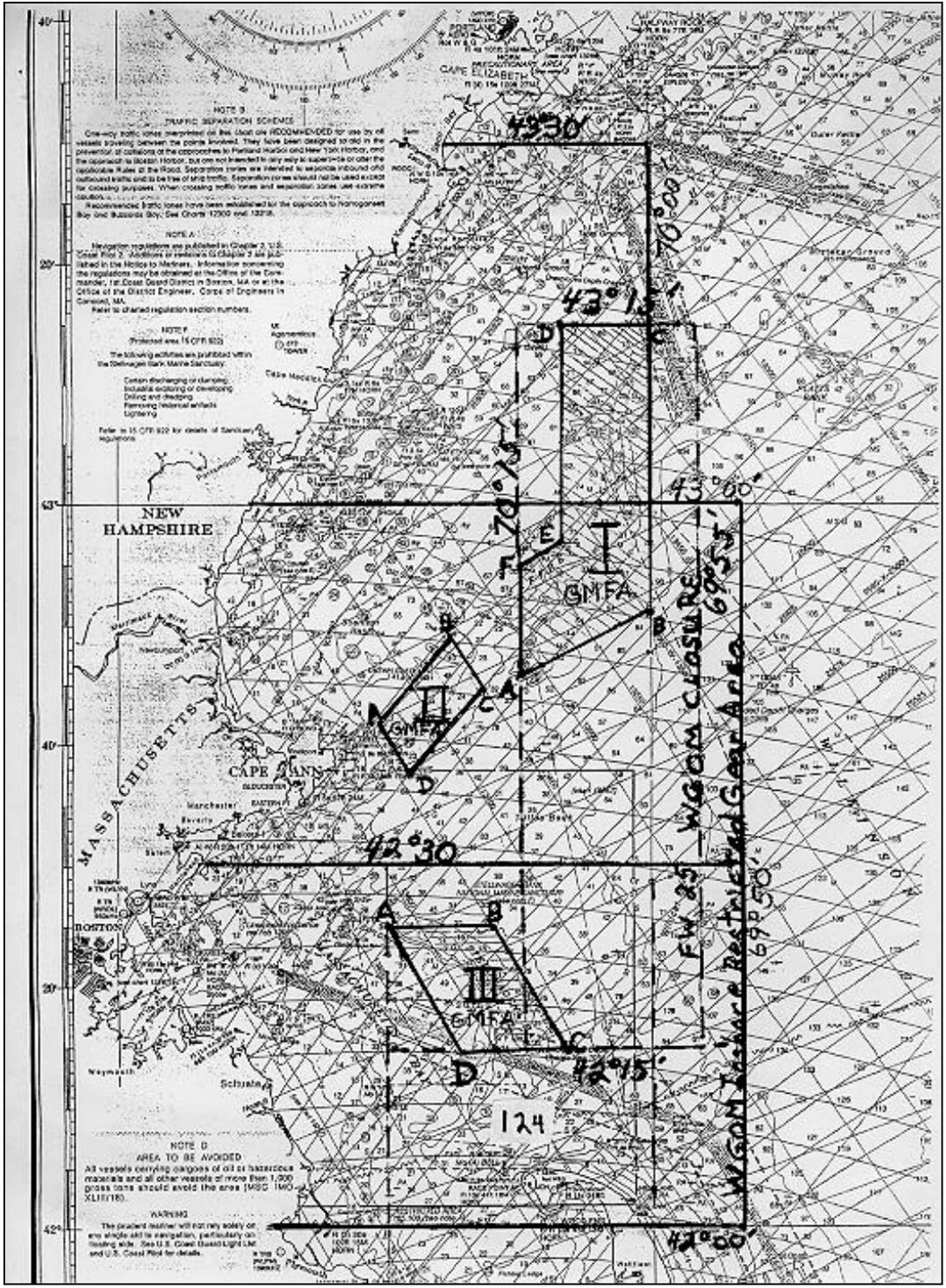
NE1 ( 1 ) 68° 55.0'  
 NE2 43° 29.6' 68° 55.0'  
 NE3 44° 04.4' 67° 48.7'  
 NE4 44° 06.9' 67° 52.8'  
 NE5 44° 31.2' 67° 02.7'  
 NE6 ( 1 ) 67° 02.7'

(1)Maine shoreline.

This proposal will eliminate current groundfish GOM two-month rolling closures and the Western Gulf of Maine Closed Area.

BLOCK		MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.
GM1	124,125	■	■	■				
GM2	131,132, 133		■	■	■			
GM3	138,139, 140			■	■	■		
GM4	145,146, 147,152				■	■	■	■
GM5	129				■	■	■	■
NORTHEAST T CLOSURE							→ 8/15	← 9/13

**Table 3 One-month rolling closures proposed in Options 3 and 4.**



**Figure 4 Area Closure Map – Options 3 and 4.** In Option 3 Area I is a year-round closure and Area II is closed Sept. 15 – Nov. 15. Area III would be replaced with a March – August closure of the northern half of Block 124 (north of 42°15'). In Option 4 Areas I and III are year-round closures, Area II is closed Sept. 15 – Nov. 15.

**Trip Limit:** Status quo trip limit as contained in Framework 31: 400 lbs./day with a maximum possession limit equal to ten times the daily limit (i.e. 4,000 pounds).

**Running clock and layover day:** The Council is considering one of two options for allowing vessels to land overages of the cod trip limit:

1. A vessel may land overages of the per-day trip limit, not to exceed the 10-day limit. A vessel landing an overage must call the hail line and report the overage, and may not call out of the DAS program until sufficient time has elapsed to account for the overage. This is the “running clock” system that was in effect until August, 1999. In addition, a vessel that lands an overage, after calling out of the DAS program, must take two additional layover days (not on the DAS clock). The vessel may not start a trip for 48 hours after calling out of the DAS program and must remain in port [except for transiting?].
2. Vessels may land a limited overage of cod as allowed under the 1999 interim rule and in Framework 31 as follows:
  - Vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program are limited to 400 pounds for each day or part of a day on the trip. On trips under 24 hours a vessel may not land more than 400 pounds of cod, and may not land cod again until 24 hours have elapsed from the start of the prior trip, although the vessel may call-out of the DAS program before 24 hours have elapsed. On trips longer than 24 hours, a vessel may land 400 pounds of cod for each full day (24 hours) of the trip and 400 pounds for any part of a 24-hour period, provided it does not call out of the DAS program until the remainder of that 24-hour period has elapsed. A vessel on a trip longer than 24 hours and landing up to 400 pounds of cod for any part of a (24-hour) day, must call the hail line to report the overage and may not leave port or call out of the DAS program for the remaining part of the 24 hours.
  - a vessel may not land more than 4,000 pounds, even if the trip duration exceeds ten days.

**Increase cod minimum size to 21 inches:** The Council proposes to increase the minimum size of cod from 19 inches to 21 inches. If it adopts this GOM cod option, the minimum size increase would apply throughout the range of cod (all stock areas).

**Discussion:** The Council did not adopt this option because the analysis showed that it would not achieve the plan’s biological objectives. This option contains shares several proposals with Option 4. It does not, however, include the February – May limitation on DAS or trips in the proposed Western GOM Restricted Fishery, and the year-round GOM Area III and Cashes Ledge closures in Option 4. It also includes an option to continue the current trip limit overage provision (implemented under the interim rule and Framework 31) as an alternative to the running clock/layover day proposal in both options. This option also includes a seasonal closure of the northern half of Block 124 (March- August) and an increase in the minimum cod size.

Based on the analysis of Option 4 and the other elements described above, this option would not likely meet the fishing mortality objectives of the plan and constrain landings to below the TAC. Of the four options, Option 3's is in the middle in terms of impacts on marine mammals. The option may present an adverse impact on essential fish habitat due to the reduced size of the year-round closures, although the level of this impact cannot be quantified.

The analysis of economic impacts of this option (and Option 4) is not comparable to that of Options 1 and 2. However, Option 3 has about 45 percent of the revenue impact of Option 4, not accounting for the impact of the cod minimum size increase, differences in the running clock proposals, and the Option 4 proposal to prohibit party/charter fishing in the GOM closed areas.

By increasing the minimum size for cod, the Council intends to increase the spawning stock biomass per recruit and yield per recruit. This action will also align recreational and commercial fish sizes as the recreational minimum fish size has been 21 inches since 1996, under Amendment 7. The Council considered this action in Framework 30 rather than in this framework but did not adopt it because of uncertainty about the impact on regulatory discards.

Minimum fish size regulations are most effective when the size corresponds to the selectivity characteristics of the gear used to catch that species. Three primary gear types catch Georges Bank cod. In 1997 otter trawls caught 60 percent, gillnets 18 percent, and hooks 13 percent. Selectivity data for the different gears is limited, but based on comments from fishermen and landings data, 6-inch mesh gillnets reportedly catch the smallest proportion of 19-21 inch fish and hooks catch the greatest. In Framework 27, the Council increased the minimum mesh size of square mesh on trawl vessels to 6.5 inches, although vessels targeting roundfish, such as cod, generally use diamond mesh rather than square, so the square mesh size increase is not likely to significantly reduce the catch of small cod.

In the development of Framework 30, the PDT discussed the potential impact of an increase in the minimum size of cod from 19 inches to 21 inches. It agreed that the minimum fish size alone would not achieve any conservation benefit over current regulations without gear changes to increase selectivity or escapement (hook size and mesh size increases). If the range of gears in currently in use does not catch a significant proportion of 19 – 21 inch cod, then increasing the minimum size will not change the exploitation pattern. If, on the other hand, some gears are catching a significant proportion of fish in that size range, then the benefits of increasing the minimum size will not be realized unless the gear selectivity pattern is changed. Current rates of discarding across all gear sectors appear to be relatively low, but whether that is the result of a relative scarcity of small fish, given the very low recruitment in recent years, or due to current gear selectivity characteristics cannot be determined.

#### 3.7.1.4 GOM cod Option 4

**DAS:** Status quo allocation of DAS. DAS usage during February –May in the Western Gulf of Maine Restricted Gear Area would be limited as described in the following section.

**Western Gulf of Maine Restricted Fishery Program:** During May, February, March and April of any fishing year a vessel fishing in the Western Gulf of Maine Restricted Gear Area (**Figure 4**) must enroll in the Western GOM Restricted Fishery Program. Enrollment is for a minimum of 30 days, and vessels enrolled in the program must have on board a letter of enrollment issued by the NMFS Regional Administrator to fish in the program area. While enrolled in the program, a vessel is limited to 25 DAS or 25 trips (call-in/call-out cycles), whichever is less, in any fishing year. Also, while enrolled in the program, all DAS and trips are counted against the allotment, regardless of where the vessel fishes. A vessel that has used its allotment of DAS or trips in the area may fish for multispecies outside of the program area under its remaining allocation of DAS.

**Area Closures:** In **Figure 4** Area I and Area III would be closed year round and Area II would be closed September 15 – November 15. In addition, the Cashes Ledge Closed Area would be extended from July through October to year round, and the one-month rolling closures in effect in the 1998 fishing year (under Framework 25) would be in effect. These are described below:

- One-month rolling closure of areas described in Table 3 below (GM1- March, GM2-April, GM3- May and GM4- June, block numbers reference Figure 1)
- One month closure, June, of block 129

The coordinates of the area closures are described in Option 3 above.

Party/charter vessels would be prohibited from fishing in GOM Closed Areas I and III during February through May.

This proposal will replace current groundfish GOM two-month rolling closures and the Western Gulf of Maine Closed Area closures.

**Trip Limit:** Status quo trip limit as contained in Framework 31: 400 lbs./day with a maximum possession limit equal to ten times the daily limit (i.e. 4,000 pounds).

**Running clock and layover day:** Except during February through May, a vessel may land overages of the per-day trip limit, not to exceed the 10-day limit. A vessel landing an overage must call the hail line and report the overage, and may not call out of the DAS program until sufficient time has elapsed to account for the overage. This is the “running clock” system that was in effect until August, 1999. In addition, a vessel that lands an overage, after calling out of the DAS program, must take two additional layover days (not on the DAS clock). The vessel may not start a trip for 48 hours after calling out of the DAS program and must remain in port. There is no running clock during February through May.

**Discussion:** As with Option 3, the analysis of this option indicates that it will not meet the fishing mortality objectives of the plan and constrain landings to below the TAC. Of the four GOM options, this option would provide the least protection harbor porpoise and endangered right whales. Although the year-round closure of two areas (Cashes Ledge and GOM Area III) currently closed only temporarily would improve the ability of these areas to recover from any adverse impacts on essential fish habitat, the overall reduction in area protected by year-round closures may present an adverse impact. The impact on the recovery of degraded habitat of this option cannot be quantified at this time.

The analysis of economic impacts of this option (and Option 3) is not comparable to that of Options 1 and 2. However, this option would result in more than twice the negative revenue impact compared to Option 3, not accounting for the impact of the cod minimum size increase (in Option 3), differences in the running clock proposals, and the Option 4 proposal to prohibit party/charter fishing in the GOM closed areas.

The following discussion is modified from that in Framework 31 where the Council considered an earlier version of this proposal. The fishermen who designed this proposal, intended it to reduce discards and to achieve the plan objectives by protecting cod spawning and habitat, reducing overall fishing power in the spring months and to provide equitable access to alternative species and fishing grounds. The PDT discussed the components of this option and noted that one of the primary distinguishing elements is the area closures. The size and configuration of the area closures precludes the use of the same analysis method that is used for Options 1 and 2 area closures that are based on quarter-degree squares. Since VTR data is not useful for precise location of fishing activity, and observer data is insufficient to determine the relative impacts of areas within the quarter-degree squares, an assumption must be made about the effect of these area closures. The PDT could not make a comparative analysis of this option with Options 1 and 2 because of the limitations on the area closure analysis.

A second distinguishing element of this option is the 25-day/trip limitation for the February – May period in the Western Gulf of Maine Restricted Fishery Program. This component is a modification of an earlier proposal that would have applied the limitation throughout the Gulf of Maine. Analysis results of the initial proposal indicated that annual landings of GOM cod would be reduced by about five to seven percent, not considering effort shifts to other times in the year. The PDT applied one half of that savings to the analysis of the current proposal that applies only to the western Gulf of Maine.

The PDT analyzed the combined effect of the measures in this option (see Section 4.1.1.3). The analysis provided a range of outcomes reflecting possible effort displacement of between 25 percent and 75 percent. The PDT did not indicate what the most likely effort displacement level would be. The analysis also provided results for both the July – October and year-round closure of Cashes Ledge. All of the analysis results exceeded the  $F_{\max}$  cod TAC of 1,918 metric tons. Based on this analysis, this option is expected to result in cod landings between 2,808 and 3,221 metric tons.

Furthermore, as the PDT commented on earlier versions of this proposal, it does not support opening areas that provide protection to other stocks that are now known to need significant conservation restrictions to meet SFA standards. While this framework is not intended to achieve any specific management goal for those other stocks, it also should not allow for a relaxation of indirect conservation benefits of existing measures. The rationale for changing the area closures under this option is to allow fishing effort to redirect on other stocks, many of which are severely overfished.

### **3.7.2 Party/charter access to GOM closed areas**

Under this proposal, party and charter vessels would be required to obtain an exemption certificate from NMFS to fish in any of the Gulf of Maine closed areas. A limited access vessel in the exemption program would be prohibited from fishing on a DAS while in possession of the certificate. The Council considered three options for the duration of the exemption certificate, and adopted the three-month program. The other two options are discussed below:

#### **3.7.2.1 Option 1 – one year certificate**

A vessel would obtain a certificate on an annual basis at the start of the fishing year and remain enrolled in the program for the entire year.

#### **3.7.2.2 Option 2 – six month certificate**

A vessel would obtain a certificate and remain enrolled in the exemption program for a minimum of six months.

**Discussion:** The Council did not adopt these options because of their potential impact on vessels that fish both commercially and as party/charter vessels, in terms of reduced revenues and flexibility. The benefits, in terms of improved closed-area catch information and enforceability of party/charter rules, would still be realized under the proposed three-month certificate, with less cost to the industry.

Under each of the various scenarios analyzed, the expected number of recreational passengers in the Gulf of Maine is close to the 1998 baseline. Option 1 is the only alternative that is likely to produce results significantly different than the baseline. Recreational party/charter groundfish effort in the Gulf of Maine may be reduced under Option 1, as the analysis projects a 2.5% decrease in the number of passengers and a 6.3% decrease in the number of cod kept. However, this option negatively affects more vessels in terms of potential loss of revenue than any other option.

Five three-month alternatives that were analyzed produce results (in terms of anglers and expected cod catch) that are all very similar to the baseline. The analysis projects very little difference between the baseline and any of the three-month alternative in terms of expected numbers of passengers and numbers of cod kept. The three-month alternatives can be assumed to have no biological impact on the stocks.

The most significant benefit of this provision will likely result in the form of better recreational party/charter fishing information for the Gulf of Maine. The Council wants to

improve its understanding of what kind and how much recreational fishing activity occurs in the Gulf of Maine closed areas. The exemption certification program should allow NMFS and the Council to document how many and which party/charter vessels fish in the closed areas and when. It will also provide an enforcement tool, as vessels that violate the party/charter regulations (particularly, sell their catch) could have their certificate revoked or be denied a certificate in the future.

### **3.7.3 Exemption for raised footrope trawl in the Gulf of Maine**

The Council considered two options to enable a fall whiting fishery with a raised footrope trawl in areas that would be closed under GOM Options 1 and 2 above. (This issue would not arise if the Council had adopted Options 3 or 4, as the area of the whiting fishery would not be affected by the area closures in those options.)

#### **3.7.3.1 Option 1**

This option would exempt the raised footrope trawl fishery from the Gulf of Maine closed areas on a seasonal basis (mostly autumn, Blocks 124 and 125).

#### **3.7.3.2 Option 2**

This option would move the boundary of the autumn (October-November) closed areas in Blocks 124 and 125 so as to not include the raised footrope trawl fishing area. If the

**Discussion:** The Council considered these options while NMFS was considering a MA DMF proposal for an exempted fishery in the area that would have required Council action for access to the portion of the closed areas that overlapped. Prior to a final decision on these framework provisions, NMFS announced that it had disapproved the exempted fishery proposal. The Council decided to consider the overall exempted fishery proposal, as well as the closed area exemption options above, in a separate framework action.

### **3.7.4 GB cod area closures**

The Council is considering five area closure options for Georges Bank cod. Options 1-4 were originally developed for consideration in Framework 30. Options 1 and 2 were originally designed for implementation without a trip limit. Option 5 is based on an industry proposal during the development of Framework 30, but because of the timing of that framework, the Council proposed the same area for closure for 30 days following implementation (anticipated for June or July, 1999). Block numbers reference Figure 1.

#### **3.7.4.1 Closed Area Option 1**

This option would close the following block/month combinations (Figure 5):

<b>Block</b>	<b>Month(s)</b>
98	June – September
111	April, May
109	May
110	May
113	June, July, September
114	May, June

**Discussion:** This option is based on incrementally picking the block/month combinations with the highest landings, using the two-bin effort displacement analysis model, until the projected landings do not exceed the TAC. This option was developed in Framework 30 to be implemented without a trip limit. The analysis indicates that with this area closure, the trip limit could be between 3,000 and 3,500 pounds per day. Of the five options under consideration, only Option 4 has a lower revenue loss per metric ton of cod saved under the full effort displacement scenario, but this option is third in total revenue loss and percent change in revenues.

#### 3.7.4.2 Closed Area Option 2

This option would close Blocks 98, 99 and 113 year round, and block 114 during May and June (Figure 6).

**Discussion:** This option was also developed in Framework 30 to be implemented without a trip limit. This option differs from Option 1 in that it is based on incrementally selecting contiguous block/month combinations with the highest landings, using the two-bin effort displacement model, to stay below the TAC without a trip limit. Selecting contiguous blocks reduces enforcement problems and costs. The analysis indicates that the trip limit could be as high as 4,000 pounds per day under this closure regime. This option also has the highest total revenue loss, percentage change in revenue and revenue loss per metric ton of cod saved under the full effort displacement scenario of the five options.

#### 3.7.4.3 Closed Area Option 3

This option would close blocks 109-114 year round (Figure 7).

**Discussion:** This option was originally developed in Framework 30 to close these specific blocks for sufficient time to keep projected landings below the TAC without a trip limit. The analysis shows that even if these blocks were to be closed year round, a trip limit of 2,000 pounds per day would be necessary to keep projected landings below the TAC. This option has the second highest revenue impact and revenue loss per metric ton of cod saved of the five options under the full effort displacement scenario.

#### 3.7.4.4 Closed Area Option 4

This option would close the following block/month combinations, in addition to a 2,000 pound per day trip limit (Figure 8):

<b>Block</b>	<b>Month</b>
98	July, August
110	May
111	April, May
113	July
114	June

**Discussion:** This option, also developed for Framework 30, is similar to Option 1, except that the analysis started with the application of a 2,000 pound per day trip limit. The model incrementally selected the block/month combinations of highest cod landings until

the projected landings were below the TAC with a 2,000 pound per day trip limit. By definition, this option would keep landings below the TAC with a 2,000 pound per day trip limit. This option also has the lowest revenue lost per metric ton of cod saved of the five options under the full effort displacement scenario, however, this analysis does not consider the enforcement, administrative and compliance costs of a series of openings and closings of individual blocks spanning a five-month period.



**Figure 5 GB cod Closed Area Option 1**

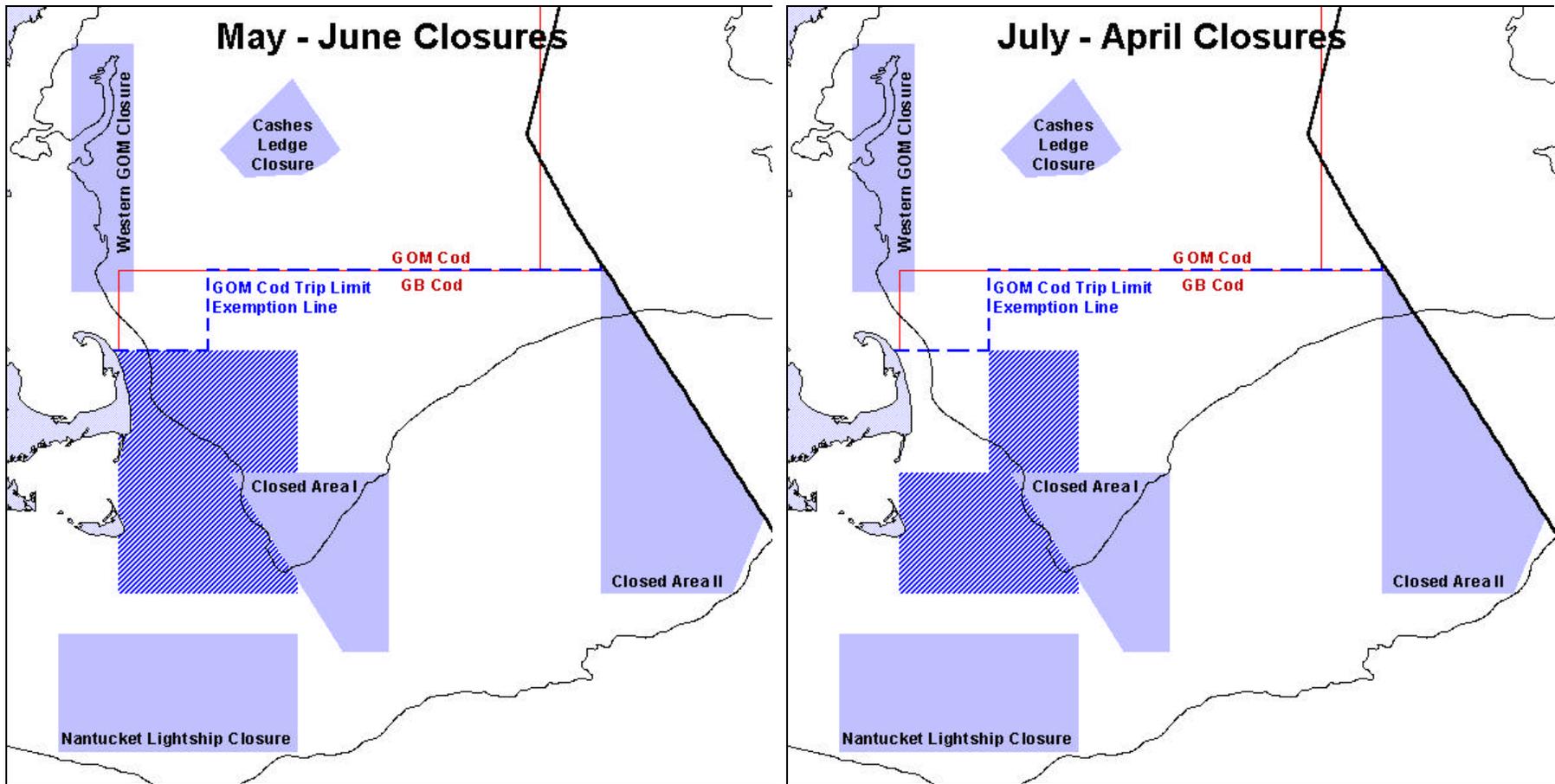


Figure 6 GB cod Closed Area Option 2

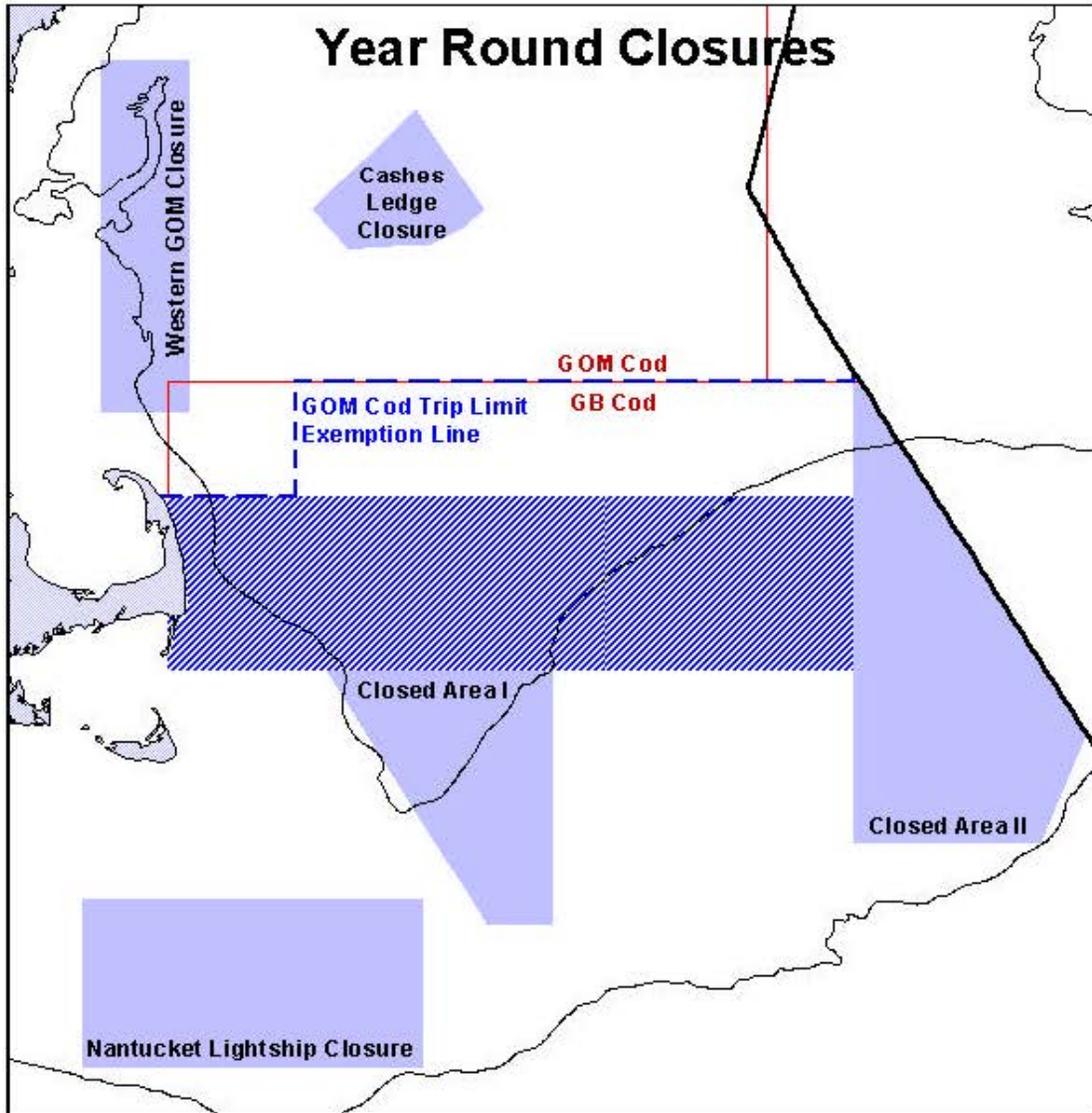


Figure 7 GB cod Closed Area Option 3

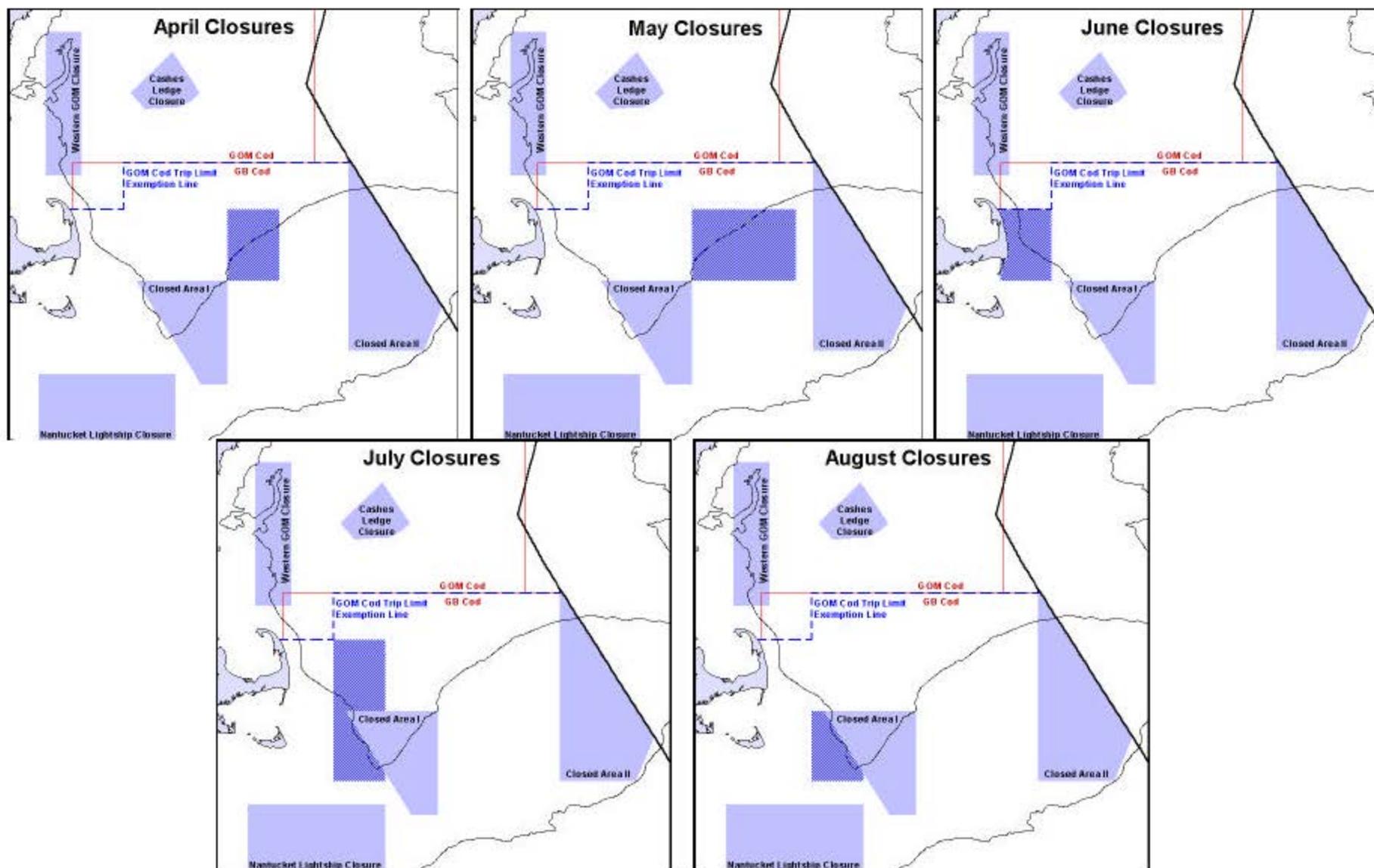


Figure 8 GB cod Closed Area Option 4

### **3.7.5 Increase cod minimum size**

Under GOM cod Option 3 above, the Council proposed to increase the minimum size of cod from 19 inches to 21 inches. If this GOM cod option were adopted, the minimum size increase would apply throughout the range of cod (all stock areas).

**Discussion:** This proposal was only under consideration under GOM Option 3 above, which the Council did not adopt because it failed to meet the biological objectives of the plan. If the Council had proposed GOM Option 3 as the final action for this framework, the cod minimum size increase would have applied throughout the range of the species. The Council considered, but did not adopt the same proposal in Framework 30. The Council did not want any further delay in the implementation of other measures in that framework while it addressed some of the issues identified with this proposal. The purpose of this measure is to increase the spawning stock biomass per recruit and the yield per recruit. However, these benefits are only realized when the size corresponds to the selectivity characteristics of the gear used to catch that species. Without commensurate gear selectivity changes, increasing the minimum size will cause discarding to increase.

Three primary gear types catch Georges Bank cod. In 1997 otter trawls caught 60 percent, gillnets 18 percent, and hooks 13 percent. Selectivity data for the different gears is limited, but based on comments from fishermen and landings data, 6-inch mesh gillnets reportedly catch the smallest proportion of 19-21 inch fish and hooks catch the greatest. In Framework 27, the Council increased the minimum mesh size of square mesh on trawl vessels to 6.5 inches, although vessels targeting roundfish, such as cod, generally use diamond mesh rather than square, so the square mesh size increase is not likely to significantly reduce the catch of small cod.

The PDT discussed the potential impact of an increase in the minimum size of cod from 19 inches to 21 inches. It agreed that the minimum fish size alone would not achieve any conservation benefit over current regulations without gear changes to increase selectivity or escapement (hook size and mesh size increases). Current rates of discarding across all gear sectors are relatively low, but that probably is the result of a relative scarcity of small fish, given the very low recruitment in recent years. The impact of discards on fishing mortality depends on the survivability of discarded fish. The survival rates of discarded cod under the diversity of gears and circumstances in the commercial fishery cannot be ascertained, however, the Council expects that, as it is in the industry's best interest to minimize discard mortality, fishermen will take all reasonable steps to do so, especially since this proposal was made by several industry groups.

### **3.7.6 Counting of first DAS of a trip**

The Council considered in GOM Option 1 or 2 above counting the first day of a multispecies DAS trip, for all vessels (not only those in the Gulf of Maine), under one of the following three options:

1. Status quo, DAS counted as actual time between call in and call out

## **4.1 Biological impacts**

### **4.1.1 Impacts on Gulf of Maine cod**

The Council considered four primary Options for Gulf of Maine cod, described in Section 3.1.1 (proposed action, Option 2) and Section 3.2.1 (alternatives rejected). Options 1 and 2 incorporate many of the same elements (options for counting of DAS, area closures and trip limits) and are differentiated by the following:

- Option 1 proposed that vessels (except Day gillnet vessels) fishing in the Gulf of Maine during May, June, July, November and December must take layover days equal to the trip length; Day gillnet vessels would be limited to 80 net tags ( a reduction of 50 percent) during the same period
- Option 2 contained two alternative closures: either close the Cashes Ledge Closed Area in November and Blocks 124 and 125 in January if 50 percent of the TAC (or 759 metric tons) is landed by July 31 (the proposed action), or close the northern half of Block 124 year round (rejected).

Options 3 and 4, both rejected by the Council, share many elements but differ in the following ways:

- DAS: both retain status quo allocations but Option 4 includes a Western Gulf of Maine Restricted Fishery Program (limit of 25 DAS or trips in the area during May, February-April)
- Area closures: both have the same primary closures but Option 3 includes a closure of the northern half of Block 124 March – August, Option 4 would prohibit party and charter vessels from fishing in the GOM closed areas during February – May, and Option 4 would include a year-round closure of the Cashes Ledge Closed Area while Option 3 would close the area July – October or longer if needed based on the analysis
- Trip limits: both options propose to reinstate the running clock and add a 2-day layover for trips that land an overage, except Option 4 suspends this requirement during February – May; as an alternative, Option 3 proposes to retain the Framework 31 trip limit/overage provisions
- Minimum fish size: Option 3 proposes to increase the cod minimum size to 21 inches, throughout the range

#### **4.1.1.1 Impact of Options 1 and 2**

##### **4.1.1.1.1 Counting of DAS**

Options 1 and 2 proposed to charge a minimum of 15 or 24 hours to every fishing trip that is three hours or more in length. The Council did not adopt these changes. There was an initial discussion that this requirement may be applied only to vessels fishing in the Gulf of Maine, but the final proposal is that it would apply to all groundfish vessels. Estimates of the impacts of this proposal are hindered by data limitations. Days-at-sea data is maintained by the NMFS Office of Enforcement, Vessel Trip Report (VTR or logbook data) is maintained by the Northeast Regional Office, and dealer data is maintained by the Northeast Fisheries Science Center. There is no direct link between the DAS database and

landings data in either the vessel logbook or dealer databases. Only the VTR database has information on catch locations entered by the fisherman completing the logbook. Landings from individual trips in the dealer database cannot be directly linked to landings in the VTR database. For these reasons, the DAS used on a particular trip cannot be associated with landings in either database, or a fishing trip in a particular area.

In order to characterize the length of trips so that the impacts of the proposal could be estimated, all three databases (DAS, dealer, and vessel logbook/VTR) were used. In addition, vessel characteristics (size, permit category) were obtained from various permit files. For the purposes of the analysis, a "trip" is defined as one call-in/call-out cycle regardless of the number of times a vessel may leave or return to port. DAS information was extracted from the DAS file (file fish97 and fish98 maintained by the Office of Enforcement). Trips were broken down into categories of three hours to twenty-four hours in length, and total trips and DAS. Principal ports were identified based on landings as reported in the dealer database; in this analysis, principal port is the port that a vessel landed most of its catch (based on revenues). A vessel's primary gear was determined as the gear the vessel used to land the majority of its catch. The analysis was performed for all groundfish vessels that used DAS, and for those vessels that reported landings from the Gulf of Maine. Because DAS cannot be assigned to specific fishing trips, vessels were identified as fishing in the Gulf of Maine if they recorded landings from this area in their VTR during the course of the year.

There are shortcomings in this analytic approach. The analysis assigns principal landing port based on the port that the vessel made the majority of its landings. Most vessels land almost their entire catch at one port, but some vessels do spread their landings among several different ports. Evaluation of the impacts on various landing ports will be incorrectly estimated if the principal port information is based on a relatively low percentage of landings. The analysis assumes that some vessels will reduce the number of trips they take to stay within DAS limits, but this is not the only possible reaction. There are additional shortcomings for that part of the analysis that focuses on vessels that fished in the Gulf of Maine. Since some vessels fish in both the Gulf of Maine and other areas during the course of the year, the number of DAS expended in the GOM may be overestimated. This will cause the analysis to overestimate the impacts of the proposal to the extent that trips outside the GOM were less than twenty-four hours in length. Since most of the trips were by vessels that landed in Portland or Gloucester, and one-way transit times from these ports to areas outside the Gulf of Maine are a minimum of four hours, it's unlikely this error significantly affects the results. The analysis also underestimates the proportion of GOM trips affected to the extent that trips assumed to be in the GOM actually took place in other areas. For example, some vessels in New Bedford fish in the Gulf of Maine, and some of their trips are shorter than 24 hours. Because of the transit time from New Bedford to Gulf of Maine fishing areas, it's unlikely that many of these short trips were actually in the Gulf of Maine, yet the analysis assumes they were.

A further shortfall in this analysis is that it makes no attempt to model changes in fisherman's behavior. Unlike the trip limit analyses that are usually performed, this analysis does not model how fishermen may shift fishing effort to other time periods to reduce

their loss in revenues. While it does try to estimate changes in level of effort it does not determine whether fishermen will compensate for the impacts on their effort by changing fishing patterns. In part because there was no attempt to model changes in behavior, the following analysis does not attempt to predict the impact on landings. It also does not consider permits that are not currently using DAS.

The following discussion characterizes trips and estimates the impacts of counting trips as a minimum of twenty-four hours because the data was readily available. If trips are counted as minimum of 15 hours, the impacts will be less. Many of the proposal's impacts are on sink gillnet vessels, who are already charged a minimum of 15 hours for any DAS trip.

### **Characterization of Trip Length**

Under the proposal to count trips as a minimum of fifteen or twenty-four hours, there are three broad possibilities for the length of trips. Trips of three hours or less are counted based on the actual time used. This provides fishermen a small window of opportunity to start the days at sea clock and then return to port and stop the clock for a variety of reasons: poor weather, equipment failure, because something was forgotten, etc. Trips of more than three hours up to twenty-four hours (or up to fifteen hours) will be charged a minimum of twenty-four hours on the DAS clock. These trips are referred to as "short trips" in the following discussion. Trips over twenty-four hours in length will be charged the actual time used. In the following characterization of trips, vessels are described according to the number of trips taken that are either three hours or less or more than twenty-four hours (since these trips count actual hours), and for trips that are more than three hours in length up to twenty-four hours (since these trips are charged a minimum of twenty-four hours).

### **All Areas**

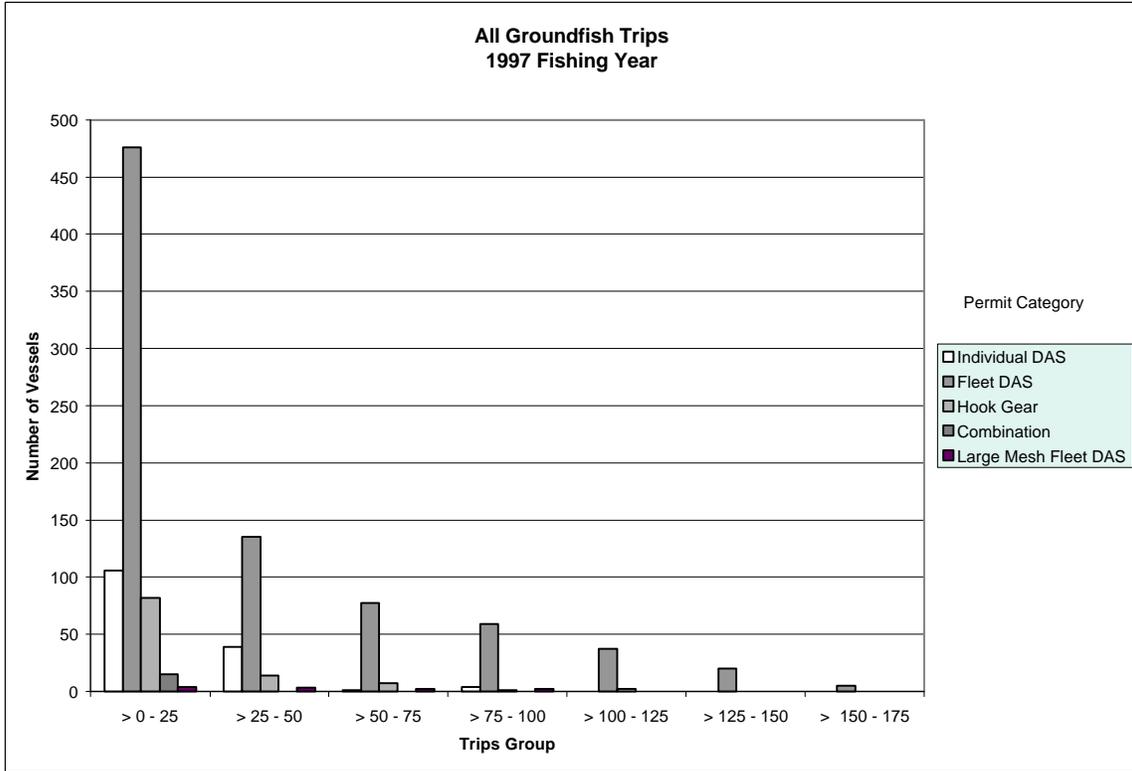
Figure 9 summarizes, by groundfish permit category, the number of trips taken by groundfish vessels in all areas in fishing year 1997. In all permit categories, most vessels take 25 trips or less. For the individual DAS and hook gear permit categories, almost all vessels made 50 trips or less. For vessels in the fleet DAS permit category, there is a wide range in the number of trips taken, with nearly 25% of the vessels taking more than 50 trips during the year. Figure 10 summarizes the information for trips that were greater than three hours and less than or equal to twenty-four hours (referred to as short trips in the following discussion). Just over half the individual DAS vessels did not make any trips of this length, and the remainder of the individual DAS vessels made 25 trips or fewer short trips. About 19% of the fleet DAS vessels did not make any short trips, while nearly half made 25 or fewer short trips. 21% of the fleet DAS vessels made more than 50 short trips.

Figure 11 summarizes frequency of trip length for the four major groundfish gear types. The data in this figure is based on vessels that used a gear for the majority of its landings, by value. For each of the gear types, the most vessels take 25 or fewer trips during the course of the year. 74% of the handline vessels, 66% of the bottom trawl vessels, 38% of the bottom longline vessels, and 37% of the sink gillnet vessels made 25 trips or less.

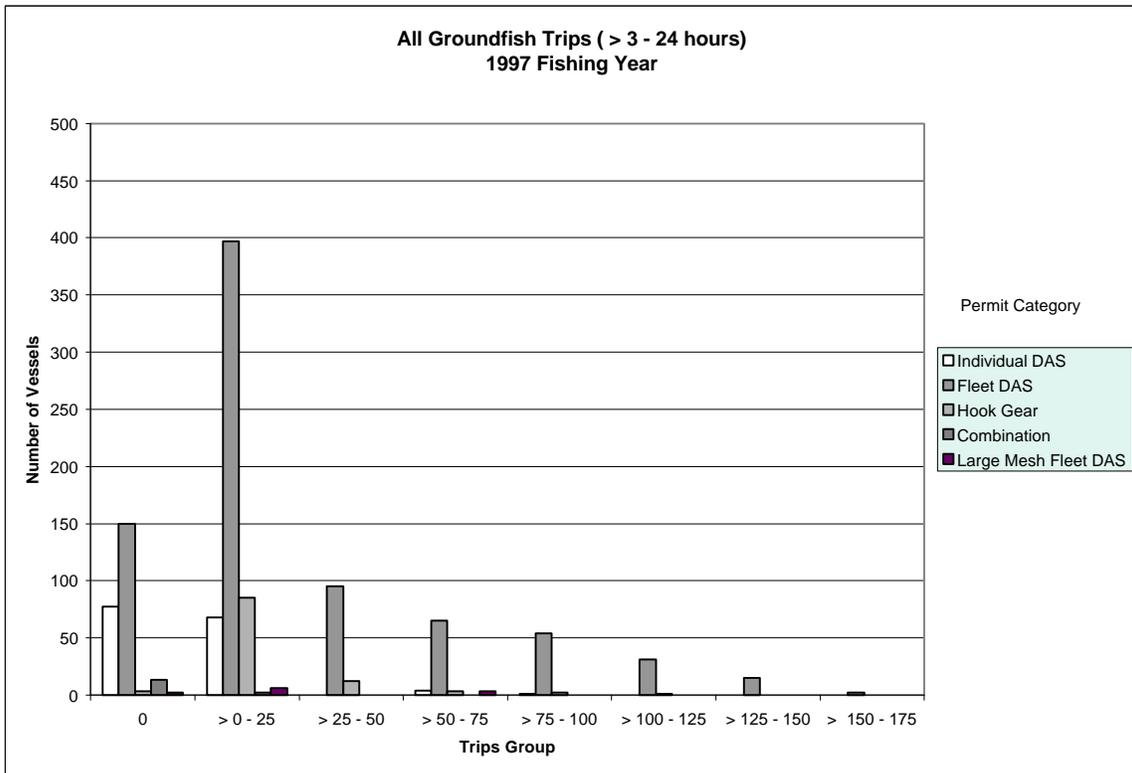
Figure 12 illustrates similar information for short trips. 82% of the handline vessels, 79% of the bottom trawl vessels, 53% of the bottom longline vessels, and 48% of the sink gillnet vessels made 25 or fewer short trips. 41% of the sink gillnet vessels, 27% of the bottom longline vessels, 12% of the bottom trawl, and 7% of the handline vessels made more than 50 short trips.

Figure 13 and Figure 14 summarize all trips and short trips by fifteen principal landing ports. Each vessel was assigned to a port based on where it landed the majority of its catch. The most frequent number of trips taken in every port except for Provincetown is twenty-five trips or less. In South Bristol ME, Portland, Boston, New Bedford, Newport, and Barnstable, there are only a small proportion of vessels that take more than 25 trips. 45% of the vessels that landed in Hampton/Seabrook, 43% of the vessels landing in Chatham, and 38% of the vessels landing in Gloucester took more than 50 trips. When examining short trips, 45% of the vessels in Hampton/Seabrook, 39% of the vessels in Chatham, and 37% of the vessels in Gloucester took more than 50 short trips.

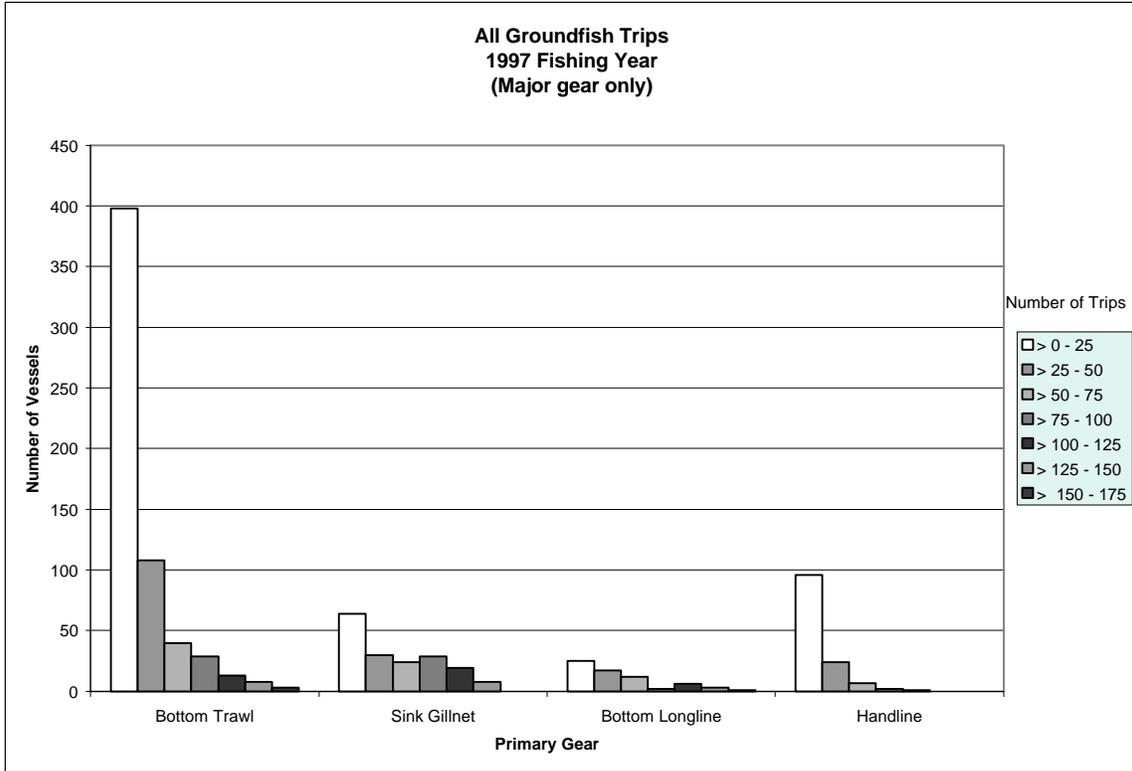
Figure 15 through Figure 20 summarize groundfish DAS trips taken during fishing year 1998. There are minor differences between observed activity in 1997 and that in 1998. Overall, more vessels took a fewer number of trips in 1998, but the changes are relatively minor. It is still true that the majority of vessels take 25 trips or less in all permit categories. There is a small increase in the number of bottom trawl vessels that took 25-50 trips, while the number of sink gillnet vessels that took more than 50 trips declined.



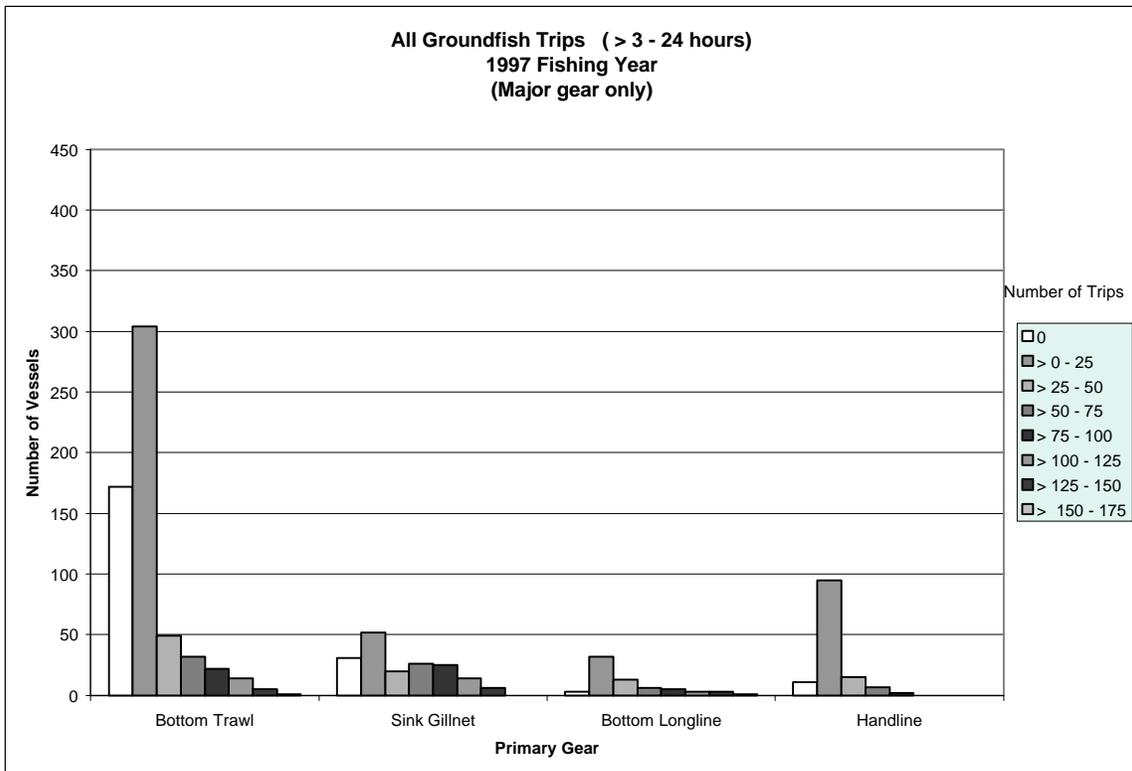
**Figure 9 – Number of trips by permit categories, fishing year 1997**



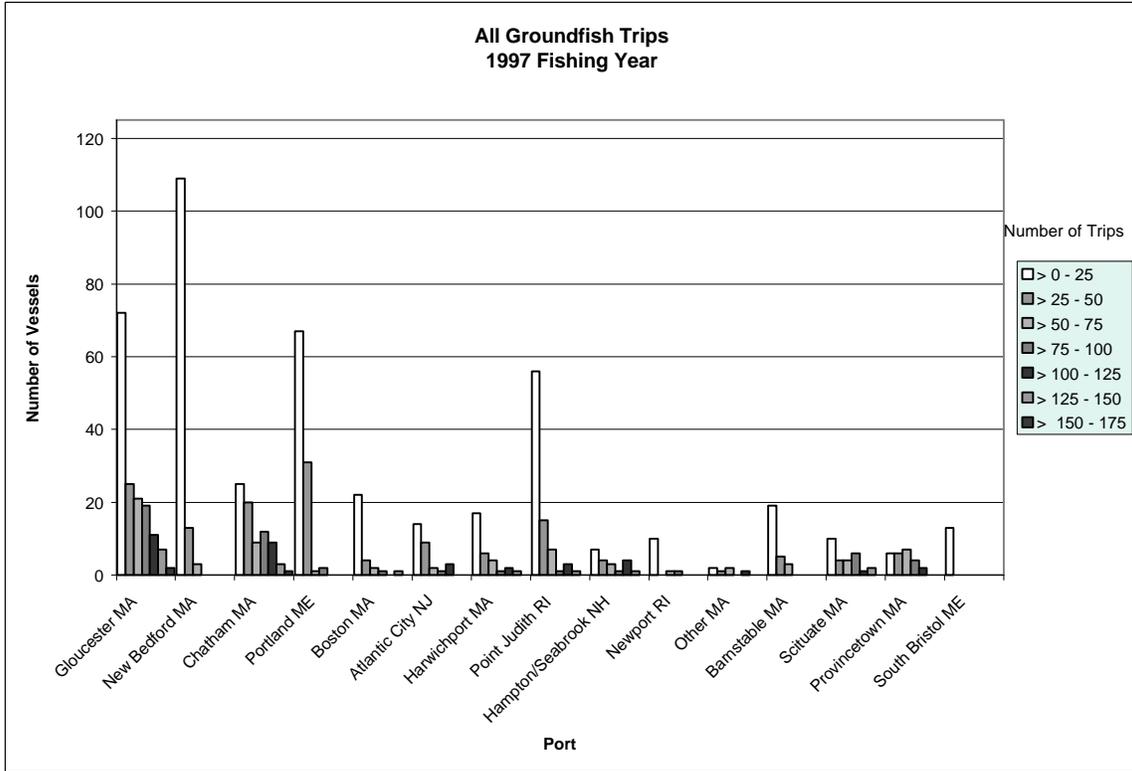
**Figure 10 – Groundfish trips (> 3 – 24 hours), by permit category, fishing year 1997**



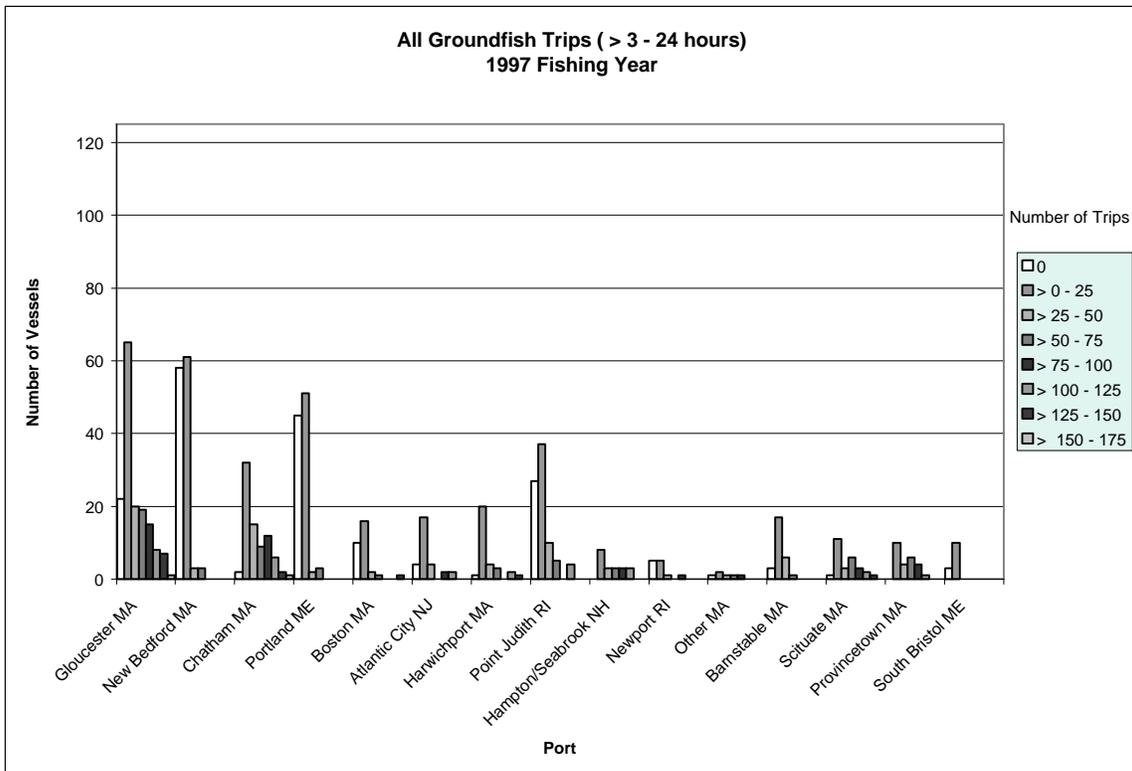
**Figure 11 – Groundfish trips, by major gear types, fishing year 1997**



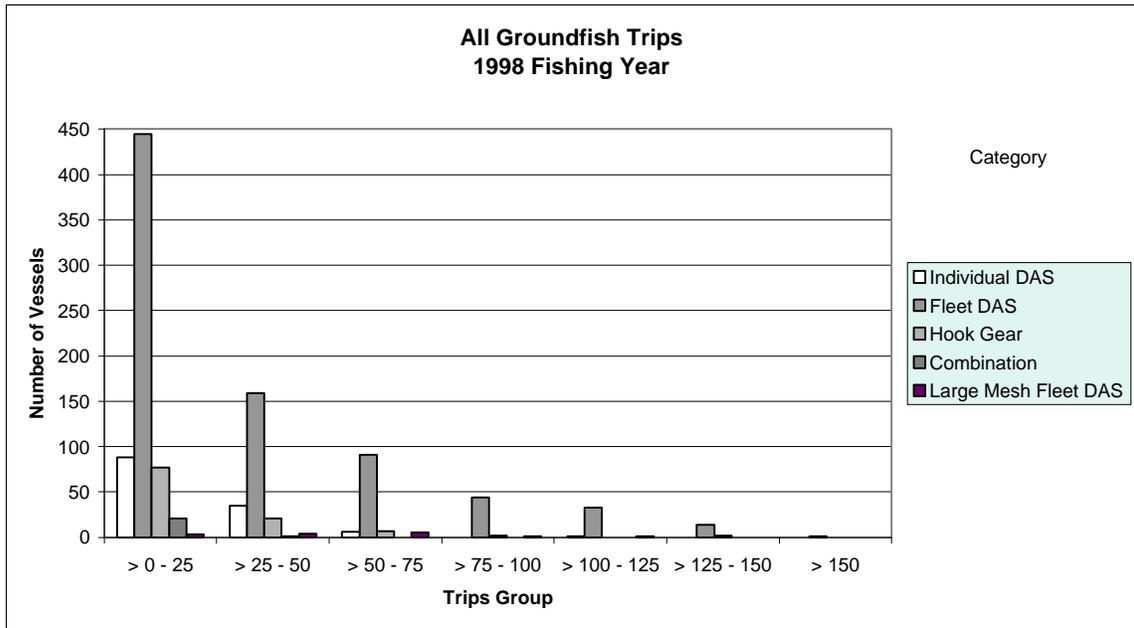
**Figure 12 – Groundfish trips (> 3 – 24 hour)s, by gear type, fishing year 1997**



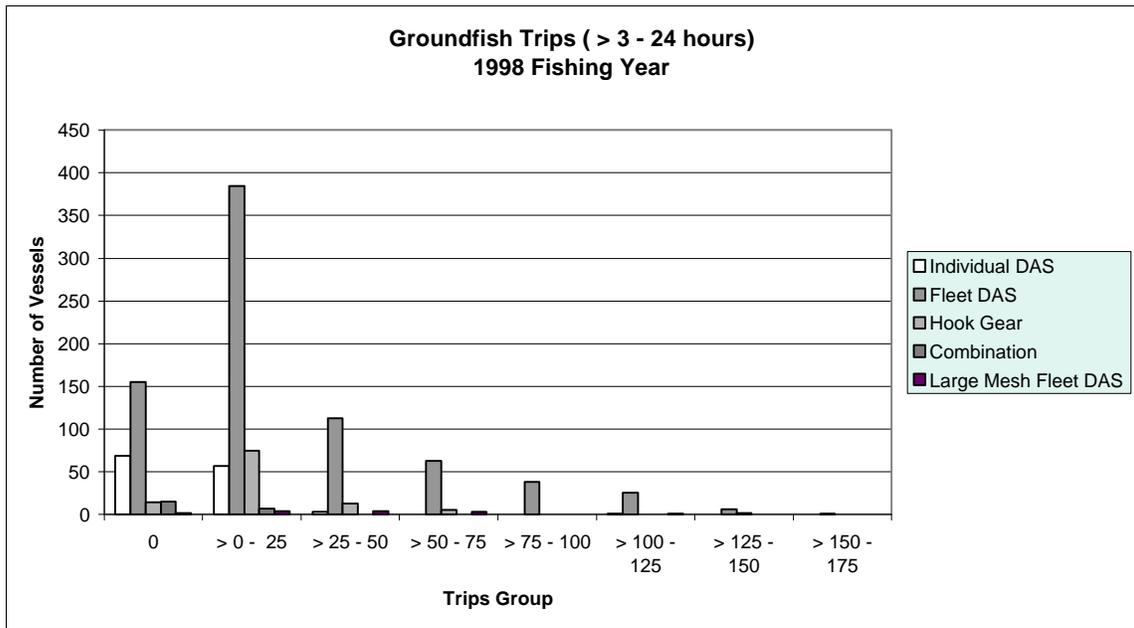
**Figure 13 – Number of groundfish trips, by landing port, fishing year 1997**



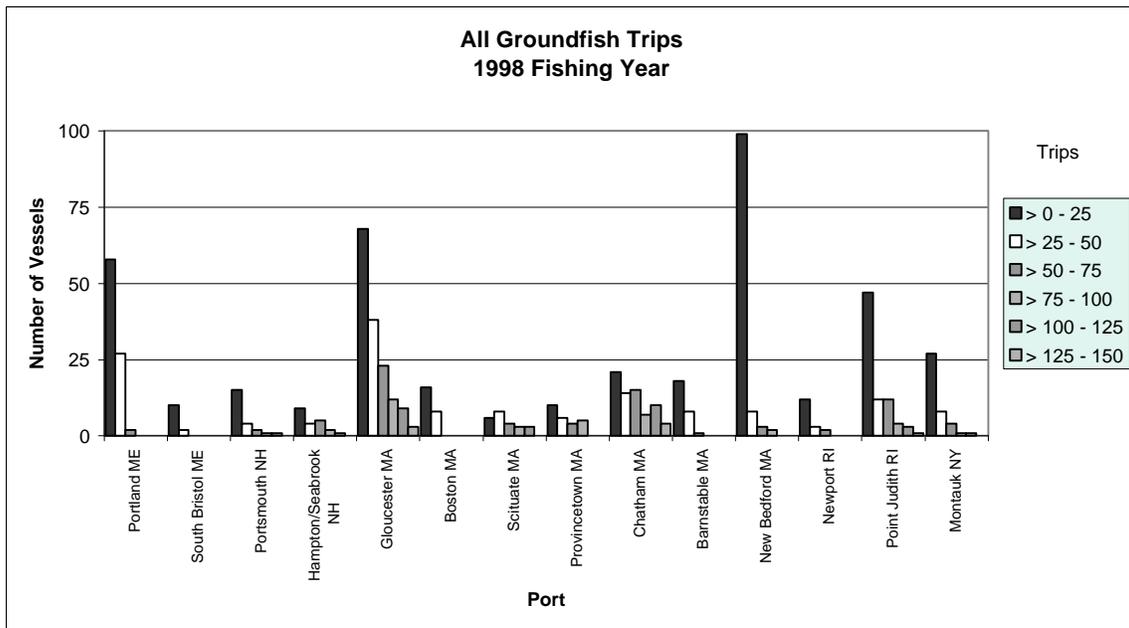
**Figure 14 – Groundfish trips (>3 – 24 hours), by landing port, fishing year 1997**



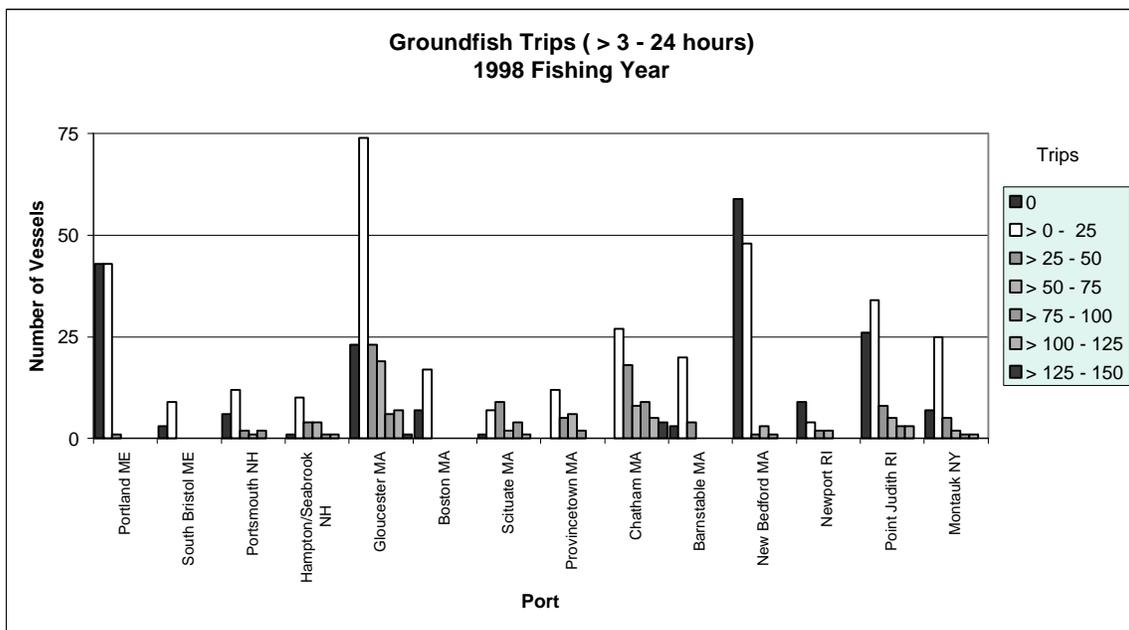
**Figure 15 – Groundfish trips, by permit category, fishing year 1998**



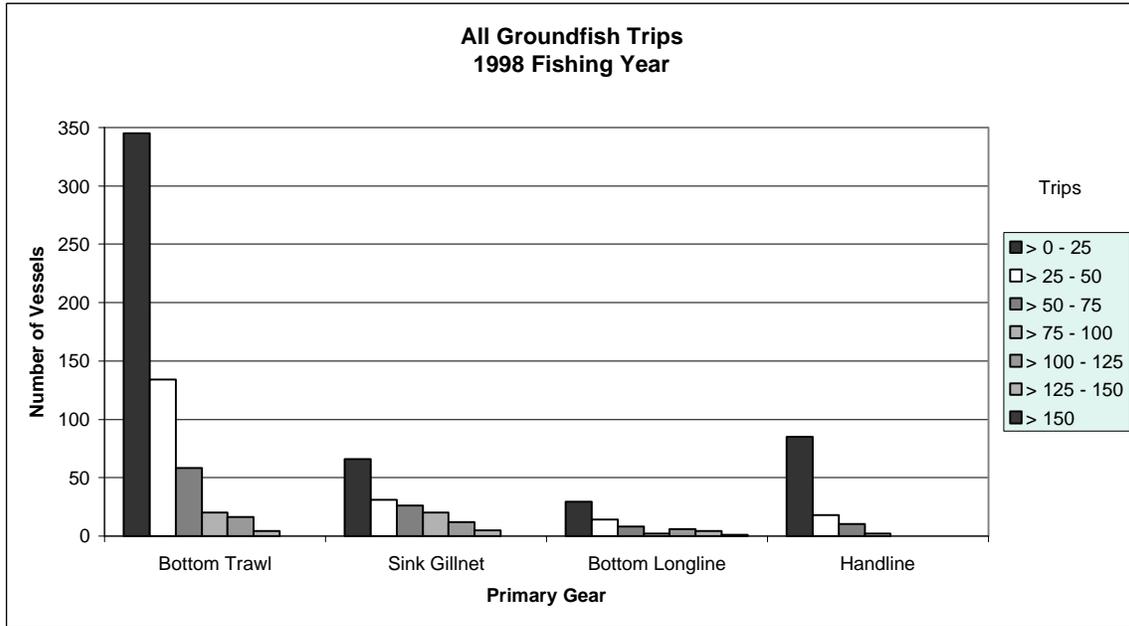
**Figure 16 – Groundfish trips (> 3 – 24 hours), by permit category, fishing year 1998**



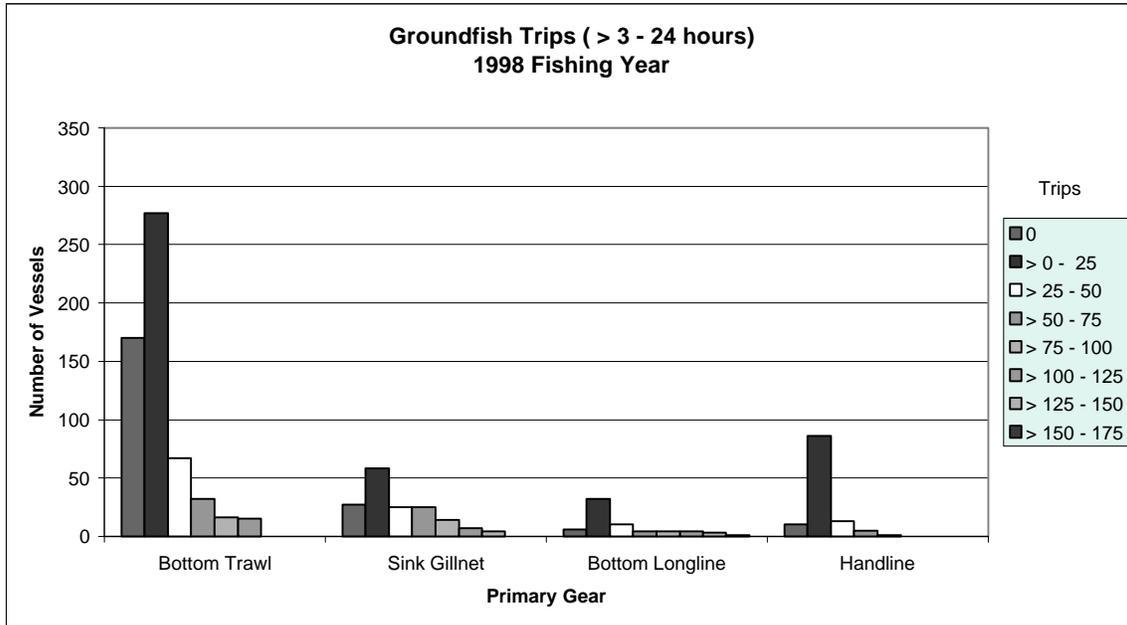
**Figure 17 – Groundfish trips, by principal landing port, fishing year 1998**



**Figure 18 - Groundfish trips (> 3 – 24 hours), by principal landing port, fishing year 1998**



**Figure 19 - Groundfish trips, for major gear types, fishing year 1998**



**Figure 20 – Groundfish trips (> 3 – 24 hours), for major gear types, fishing year 1998**

## **Gulf of Maine**

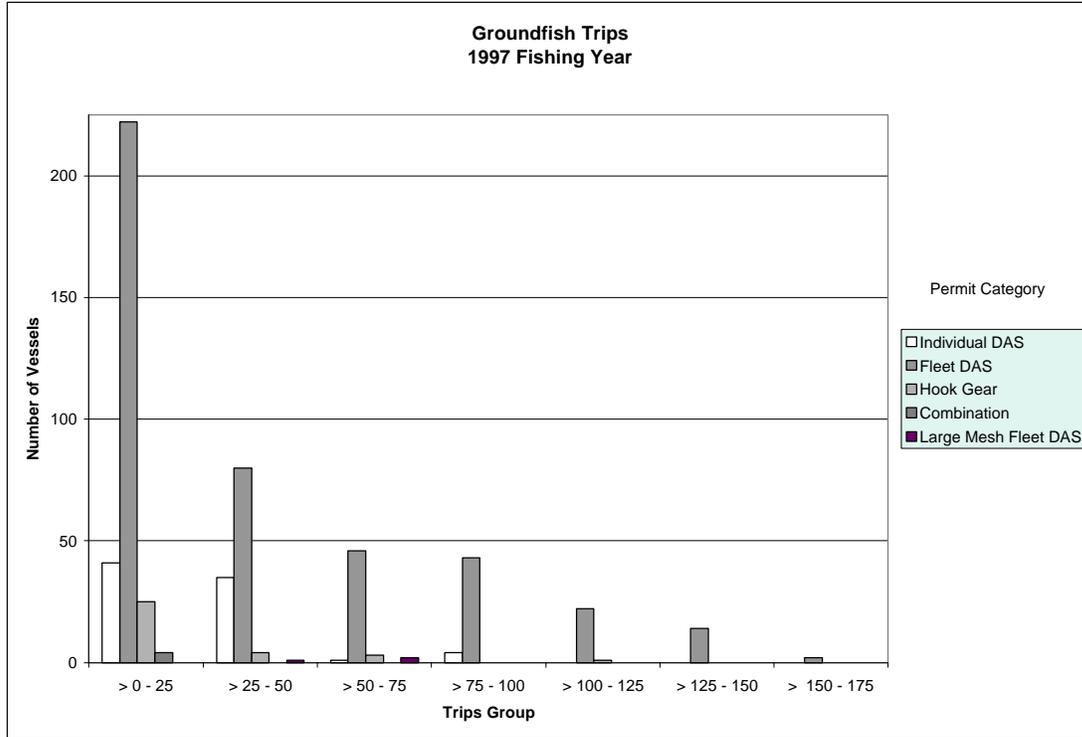
Because there was an initial discussion that increasing the minimum time charged to a vessel would only apply to vessels fishing in the Gulf of Maine, actual fishing activity in fishing year 1997 was analyzed for the impacts of this measure. Figure 21 summarizes, by groundfish permit category, the number of trips taken by vessels that fished in the Gulf of Maine in fishing year 1997. (As described above, data limitations mean that this figure may not accurately reflect the number of trips taken in the Gulf of Maine. Vessels are included in this category if they reported taking any trips from the Gulf of Maine in fishing year 1997). In all permit categories, most vessels take 25 trips or less. For the individual permit category, almost all vessels took 50 groundfish trips or less during the course of the fishing year. Fleet DAS permits had a wider distribution in the number of trips, though again most boats took 50 trips or less. Almost all vessels with hook gear permits took 25 trips or less. Figure 22 summarizes the distribution of trips that were more than three hours in length to twenty-four hours in length. The overwhelming majority of these trips were taken by fleet DAS category permits. As shown in the table, there are some individual and fleet category vessels that did not take any trips of this length. There are a number of fleet category vessels that took more than 50 trips that were of this length.

Figure 23 presents information on number of groundfish trips by vessels that fished in the Gulf of Maine, sorted by gear type. Only the major gear types are shown (there are a small number of groundfish trips by vessels who obtain most of their revenues from a wide variety of other gear types). Once again, the most common number of trips is 25 trips or less. There are noticeable differences between the four gear types shown. The majority of bottom trawl vessels take 25 trips or less. With sink gillnet vessels, there is more variation in the number of trips that are taken, with 40 vessels (one-third) taking between 50 and 100 trips. There are some bottom trawl, sink gillnet, and bottom longline vessels that took more than 75 trips in fishing year 1997. **Figure 24** summarize short trips for the four major gear types. Most bottom trawl, bottom longline, and handline vessels make 25 or fewer short trips, though there are some vessels that make more than 50 trips. Sink gillnet vessels show a more even distribution in number of trips. Most sink gillnet vessels take more than 25 trips. There are almost as many sink gillnet vessels taking more than 50 trips as there are taking 25 trips or less.

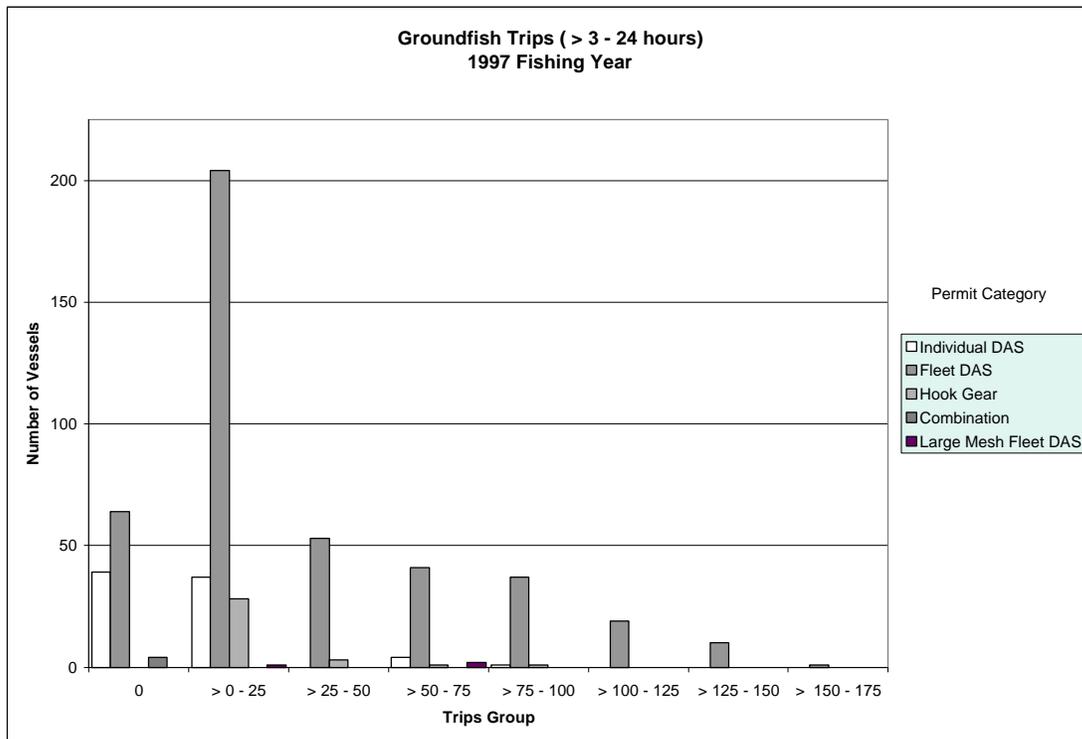
Figure 25 summarize information on the number of trips of all lengths by primary landing port for ten ports abutting the Gulf of Maine. As expected, this figure shows the majority of groundfish trips by vessels that fish in the Gulf of Maine are taken by vessels that land their catch in Gloucester, MA and Portland, ME. The figure also shows that there are differences between these two ports. Almost all of the vessels that land in Portland, ME took 50 groundfish trips or fewer in fishing year 1997. In Gloucester, by comparison, while most vessels also took 50 trips or fewer, there is a larger proportion of vessels that took more than 50 trips in the year. The most common number of trips for vessels that landed in Provincetown, MA was between 50 and 75, and in New Bedford, the most common number of trips taken was 25 to 50. In all other ports, the most common number of trips taken was 25 or fewer. Portsmouth NH, Hampton/Seabrook NH, Scituate MA, and Provincetown MA also show a wide range in the number of trips taken.

**Figure 26** summarizes information on short trips, by principal landing port, for vessels that fished in the Gulf of Maine. This chart shows that very few vessels that landing in Portland ME had more than 25 trips that were between 3 and 24 hours in length. Almost as many vessels in Portland did not have any short trips. New Bedford is the only port that the most common occurrence of short trips was not to have any. In Gloucester and the other ports, there is a wide range in the number of short trips that vessels have.

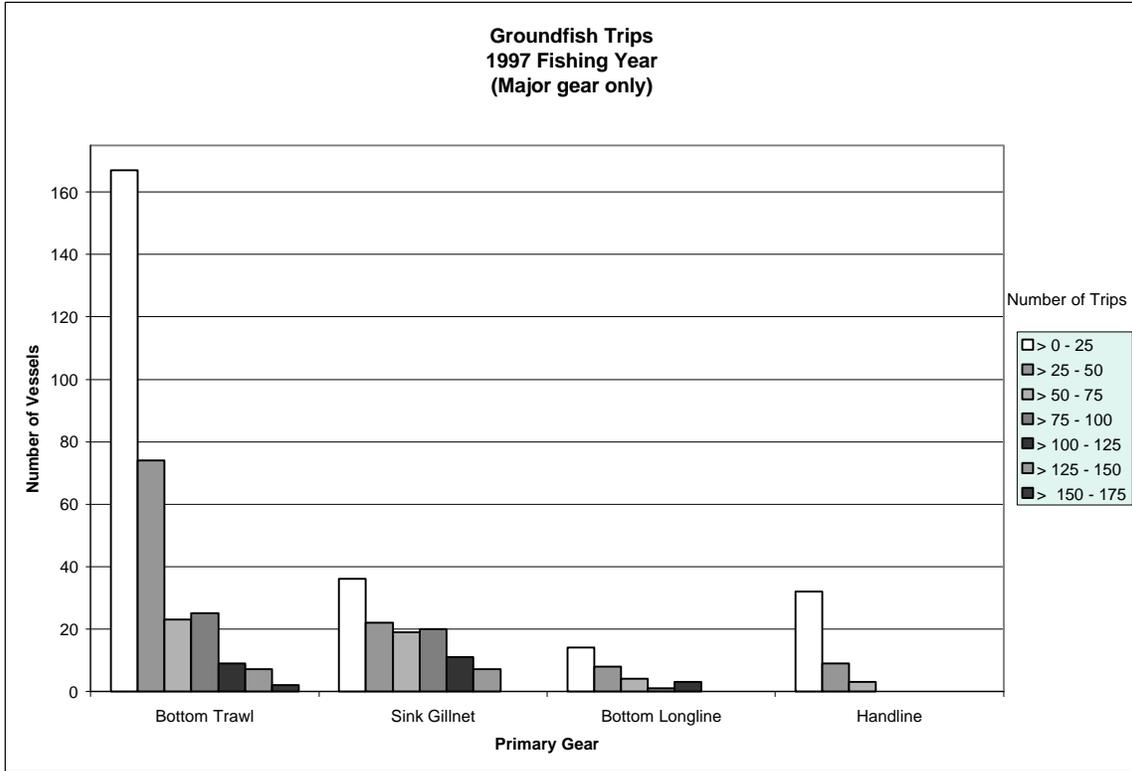
Some preliminary conclusions can be inferred from the number of trips shown in these figures. These conclusions are not unexpected. Generally, individual DAS vessels take fewer trips than the other permit categories. Since other data shows these vessels use the highest percentage of allocated DAS, in general these vessels must be taking longer trips than the other permit categories. With respect to gear type, all gear types show a wide range in the number of trips taken. The distribution in number of trips for sink gillnet vessels is more even than in the other permit categories. With respect to ports, a higher proportion of vessels that land in Portland appear to take fewer trips than in other ports. These observations suggest that, based on observed 1997 fishing activity, any measure designed to change the DAS counting method for trips between 3 and 24 hours will have fewer impacts on individual DAS vessels and vessels that landed in Portland. It will also have the greatest impact on sink gillnet vessels.



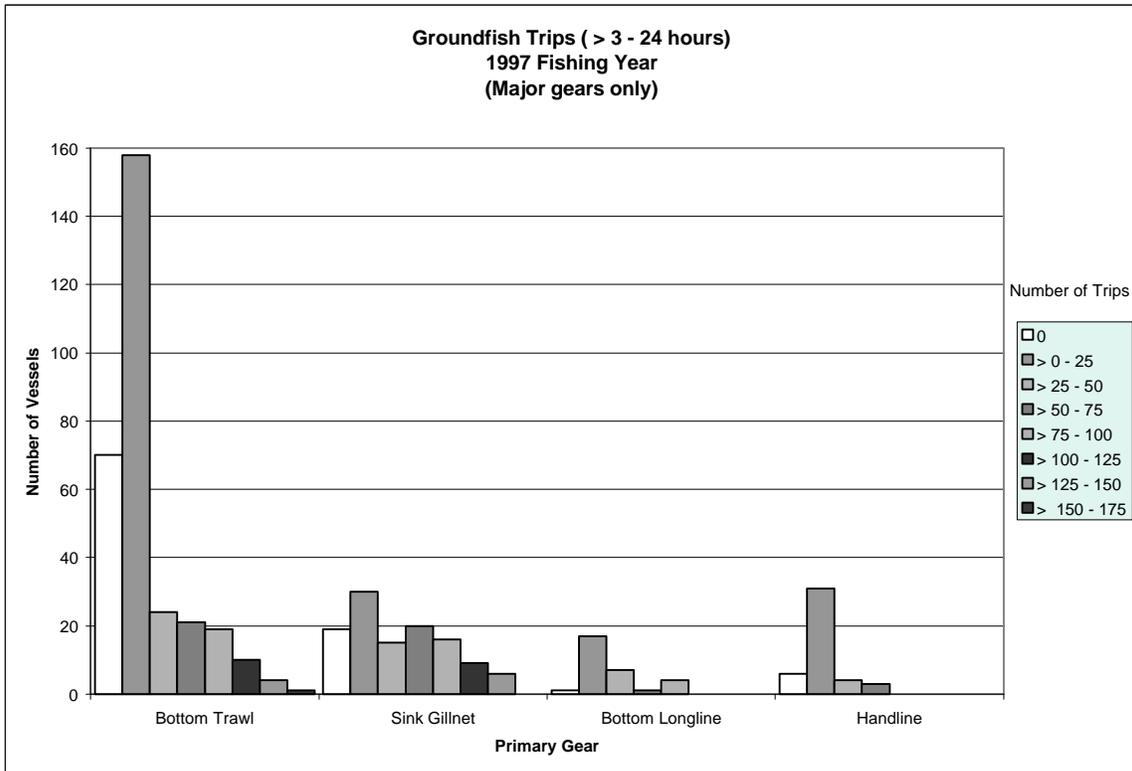
**Figure 21 – Number of groundfish trips for vessels that fished in the Gulf of Maine, fishing year 1997**



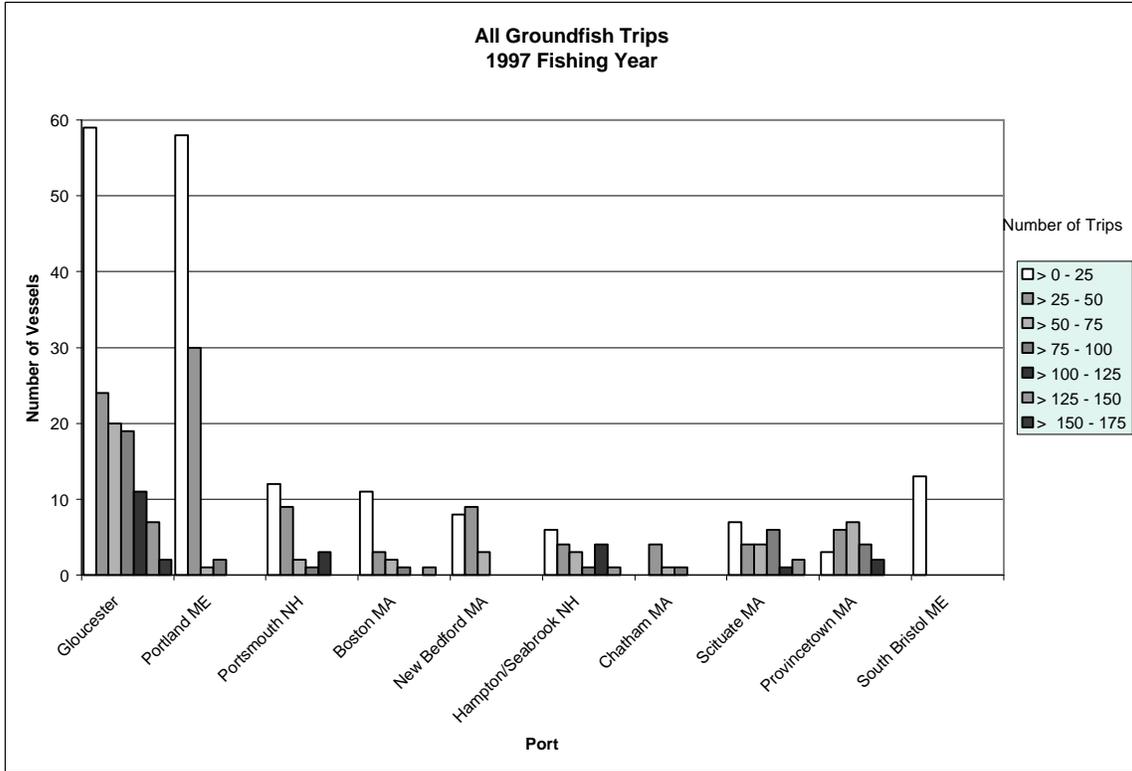
**Figure 22 - Number of groundfish trips (> 3 – 24 hours) for vessels that fished in the Gulf of Maine, fishing year 1997**



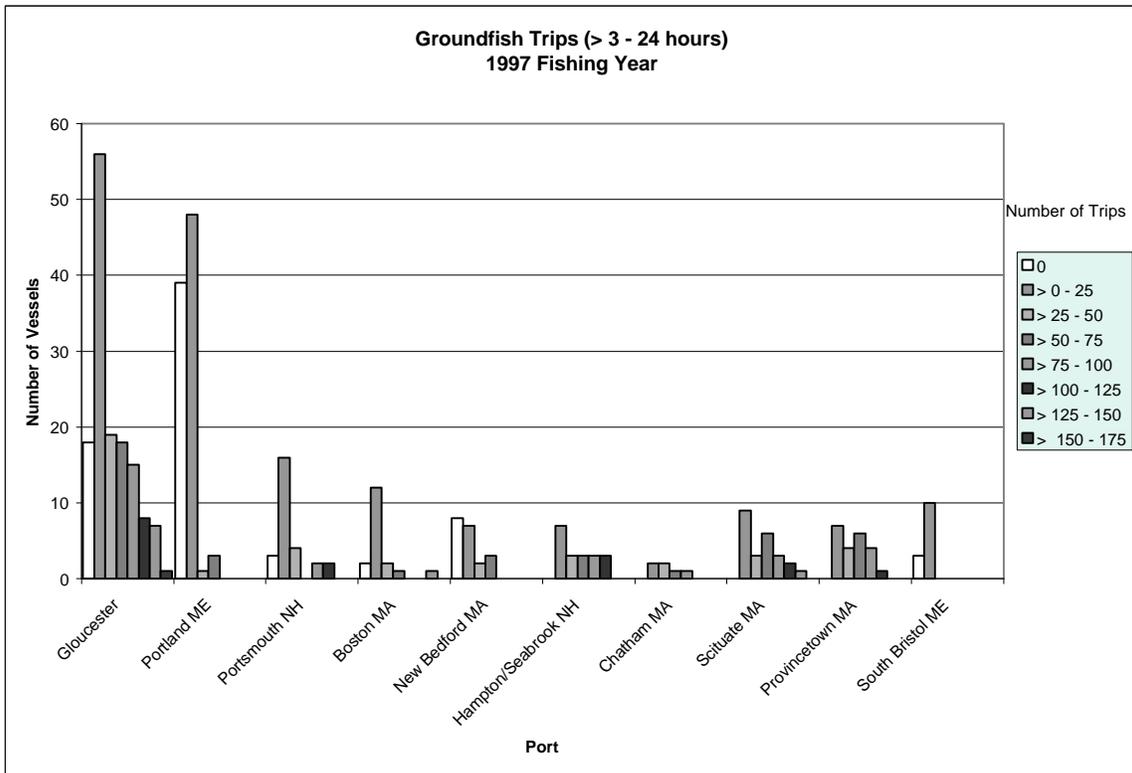
**Figure 23 – Groundfish trips by vessels that fished in the Gulf of Maine, by major gear types, fishing year 1997**



**Figure 24 – Groundfish trips (> 3 – 24 hours), by gear type, by vessels that fished in the Gulf of Maine, fishing year 1997**



**Figure 25 – Groundfish trips by vessels that fished in the Gulf of Maine, by landing port, fishing year 1997**



**Figure 26 – Groundfish trips (> 3 – 24 hours) for vessels that fished in the Gulf of Maine, by port, fishing year 1997**

## **Estimated Impacts**

As noted above, the DAS used by each vessel were broken down into two categories based on the length of the trips: trips that were three hours to twenty-four hours in length, and total trips. DAS used were summed for each category. Only trips that were three hours to twenty-four hours in length will be impacted by the proposal. These trips would be counted as a minimum of twenty-four hours in length. The proposal was applied to observed fishing activity in fishing year 1997. For every vessel that fished in the Gulf of Maine, the DAS calculated if the proposal were in effect totals the number of DAS used on trips of less than three hours or more than twenty-four hours (trips that are unaffected by the proposal), plus one DAS for every trip of three to twenty-four hours.

Applying the proposal to observed activity in a previous fishing year results in a calculated DAS level that is higher than the DAS actually charged. While this will change the apparent DAS used, effort will only be reduced if the calculated DAS exceed the vessel's allocated DAS. The assumption in the analysis is that since the proposal impacts trips of one day or less, the reaction of the fisherman will be to take fewer trips of one day or less. Because these trips will be charged a minimum of twenty-four hours, the number of trips that will not be taken is calculated to be equal to the difference between the calculated DAS and the allocated DAS. Since a vessel cannot take a partial trip, fractional DAS/trips are rounded up to the next whole number. The number of trips that would be "lost" are then summed. The results of this analysis are summarized in the following series of tables.

## **All Areas**

Table 4 summarizes the estimated impacts by vessel permit category for fishing year 1997. Of the DAS used by individual DAS vessels, 14% of their trips were short trips but they used only 2% of their DAS on these trips. Applying a 24 hour minimum to short trips would result in 8% of the vessels losing a total of 1% of the trips taken by these vessels. 38% of the DASu used by fleet DAS vessels were used on short trips; in fact, the majority of the trips – 77% - taken by these vessels were between 3 and 24 hours in length. Applying the 24 hour minimum to these trips would result in 14% of the vessels losing 10% of the trips. 81% of the trips taken by hook gear permits were short trips, and 54% of the DAS used by this category were used on short trips. Because these vessels used only a small portion of their DAS, applying the 24 hour minimum to these trips results in the loss of only 2% of the trips by 2% of the vessels.

Table 5 summarizes the estimated impacts by principal gear type. 15% of the DAS used by bottom trawl vessels were on short trips, compared to 50% of the DAS used by sink gillnet vessels, 51% of the DAS used by bottom longline vessels, and 52% of eh DAS used by handline vessels. Applying the 24 hour minimum would result in 11% of the bottom trawl vessels losing 7% of their trips, 28% of the sink gillnet vessels losing 13% of their trips, 15% of the bottom longline vessels losing 11% of their trips, and 2% of the handline vessels losing 1% of their trips.

Table 6 estimates the impacts based on principal landing port. Chargin vessels a minimum of 24 hours for short trips would have the most impact on the number of trips by vessels

that landed in Gloucester, Hampton/Seabrook NH, Chatham, Boston, and Atlantic City NJ. It would have the least impact on Portland, Barnstable, and New Bedford.

Table 13 through Table 15 estimate the impacts if trips over three hours in length were counted as a minimum of 24 hours during fishing year 1998. These tables show that there were fewer trips in 1998, and fewer short trips, even though the number of DAS used increased. The percentage of shore trips decreased for individual, fleet, and hook gear permit categories, but increased for combination and large mesh fleet DAS categories. Overall, the percentage of DAS used on short trips also decreased. When DAS used is examined based on gear type, sink gillnet vessels used a lower percentage of DAS on short trips in 1998, while bottom trawl, bottom longline, and handline vessels all used a higher percentage.

These statistics indicate that vessels took longer trips in 1998. It's unclear if this means vessels were on the water more, or if the running clock is reflected in an apparent increase in trip length. In any case, the result is that the impacts of the proposal are slightly less than if based on 1997 fishing activity. Overall, 7% of trips in 1998 would have been "lost", and 10% of the vessels using DAS would have lost trips. The impacts are in the same range as in 1997.

	Permit Category					Grand Total
	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	
Number of Vessels	150	809	106	15	11	1,091
Total Number of Trips	3,419	27,620	1,895	98	438	33,470
Total Trips > 3 - 24 hours	484	21,173	1,540	2	282	23,481
<b>Percentage of short trips</b>	<b>14%</b>	<b>77%</b>	<b>81%</b>	<b>2%</b>	<b>64%</b>	<b>70%</b>
DAS Allocated	19,028	71,093	9,328	1,136	1,320	101,905
Total DAS Used	15,980	30,757	1,545	596	585	49,463
<b>Percentage of DAS used</b>	<b>84%</b>	<b>43%</b>	<b>17%</b>	<b>52%</b>	<b>44%</b>	<b>49%</b>
DAS Used on Trips > 3 - 24 Hours	271	11,538	834	1	189	12,832
<b>% Used DAS on &gt; 3 - 24 Hour Trips (% of used DAS)</b>	<b>2%</b>	<b>38%</b>	<b>54%</b>	<b>0%</b>	<b>32%</b>	<b>26%</b>
Sum of Lost Trips	24	2,675	37	0	6	2,742
<b>Percentage of trips "lost"</b>	<b>1%</b>	<b>10%</b>	<b>2%</b>	<b>0%</b>	<b>1%</b>	<b>8%</b>
Number of Vessels "Losing" Trips	10	114	2	0	1	127
<b>Percentage of vessels losing trips</b>	<b>8%</b>	<b>14%</b>	<b>2%</b>	<b>0%</b>	<b>9%</b>	<b>12%</b>

**Table 4 – Estimated impacts, by permit category, of proposal to charge 24 hours for trips of > 3 – 24 hours, based on observed 1997 fishing activity**

	Permit Category					
	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Grand Total
Number of Vessels	130	787	109	22	14	1,062
Total Number of Trips	3,228	25,924	2,284	216	682	32,334
Total Trips > 3 - 24 hours	365	18,212	1,757	27	485	20,846
<b>Percentage of short trips</b>	<b>11%</b>	<b>70%</b>	<b>77%</b>	<b>13%</b>	<b>71%</b>	<b>63%</b>
DAS Allocated	17,079	75,408	10,482	1,573	1,805	106,347
Total DAS Used	15,271	33,945	1,910	1,071	738	52,935
<b>Percentage of DAS Used</b>	<b>89%</b>	<b>45%</b>	<b>18%</b>	<b>68%</b>	<b>41%</b>	<b>50%</b>
DAS Used on Trips > 3 - 24 hours	194	9,931	944	14	306	11,389
<b>% Used DAS on &gt; 3 - 24 Hour Trips (% of used DAS)</b>	<b>1%</b>	<b>29%</b>	<b>49%</b>	<b>1%</b>	<b>42%</b>	<b>22%</b>
Sum of Lost Trips	36	2,006	70	0	14	2,126
<b>Percentage of trips "lost"</b>	<b>1%</b>	<b>8%</b>	<b>3%</b>	<b>0%</b>	<b>2%</b>	<b>7%</b>
Number of Vessels "Losing" Trips	9	94	2	0	2	107
<b>Percentage of Vessels Losing Trips</b>	<b>7%</b>	<b>12%</b>	<b>2%</b>	<b>0%</b>	<b>14%</b>	<b>10%</b>

**Table 7 – Estimated impacts, by permit category, of proposal to charge 24 hours for trips of > 3 – 24 hours, based on observed 1998 fishing activity**

	Primary Gear			
	Bottom Trawl	Sink Gillnet	Bottom Longline	Handline
Number of Vessels	577	160	64	115
Total Number of Trips	17,221	7,286	2,924	2,135
Total Trips > 3 - 24 hours	9,271	5,457	2,372	1,640
<b>Percentage of short trips</b>	<b>54%</b>	<b>75%</b>	<b>81%</b>	<b>77%</b>
DAS Allocated	59,112	16,155	6,194	11,130
Total DAS Used	36,013	9,194	2,598	1,960
<b>Percentage of DAS Used</b>	<b>61%</b>	<b>57%</b>	<b>42%</b>	<b>18%</b>
DAS Used on Trips > 3 - 24 hours	4,813	3,387	1,273	907
<b>% Used DAS on &gt; 3 - 24 Hour Trips (% of used DAS)</b>	<b>13%</b>	<b>37%</b>	<b>49%</b>	<b>46%</b>
Sum of Lost Trips	702	942	362	2
<b>Percentage of trips "lost"</b>	<b>4%</b>	<b>13%</b>	<b>12%</b>	<b>0%</b>
Number of Vessels "Losing" Trips	49	40	12	1
<b>Percentage of Vessels Losing Trips</b>	<b>8%</b>	<b>25%</b>	<b>19%</b>	<b>1%</b>

**Table 8 – Estimated impacts of counting short trips as a minimum of 24 hours, all groundfish vessels, based on fishing year 1998**

	Portland, ME	South Bristol, ME	Gloucester, MA	Boston, MA	Chatham, MA	New Bedford, MA	Province-town, MA	Scituate MA	Harwichport, MA	Portsmouth, NH	Hampton/Seabrook NH	Newport RI	Point Judith, RI
Number of Vessels	87	12	153	24	71	112	25	24	26	23	21	17	79
Total Number of Trips	1,933	175	5,967	534	3,965	2,134	1,081	1,259	1,030	644	889	360	2,458
Total Trips > 3 - 24 hours	186	25	4,055	115	3,350	464	827	1,011	876	366	704	221	1,492
<b>Percentage of short trips</b>	<b>10%</b>	<b>14%</b>	<b>68%</b>	<b>22%</b>	<b>84%</b>	<b>22%</b>	<b>77%</b>	<b>80%</b>	<b>85%</b>	<b>57%</b>	<b>79%</b>	<b>61%</b>	<b>61%</b>
DAS Allocated	9,666	1,158	15,618	2,932	6,910	12,084	2,336	2,377	2,508	2,327	2,017	1,594	7,710
Total DAS Used	7,733	581	8,184	2,329	2,948	9,488	950	1,062	748	1,413	791	898	4,082
<b>Percentage of DAS Used</b>	<b>80%</b>	<b>50%</b>	<b>52%</b>	<b>79%</b>	<b>43%</b>	<b>79%</b>	<b>41%</b>	<b>45%</b>	<b>30%</b>	<b>61%</b>	<b>39%</b>	<b>56%</b>	<b>53%</b>
DAS Used on Trips > 3 - 24 hours	111	17	2,229	65	1,926	260	468	580	487	220	369	124	750
<b>% Used DAS on &gt; 3 - 24 Hour Trips (% of used DAS)</b>	<b>1%</b>	<b>3%</b>	<b>27%</b>	<b>3%</b>	<b>65%</b>	<b>3%</b>	<b>49%</b>	<b>55%</b>	<b>65%</b>	<b>16%</b>	<b>47%</b>	<b>14%</b>	<b>18%</b>
Sum of Lost Trips	12	0	480	9	562	3	26	109	76	33	103	15	112
<b>Percentage of trips "lost"</b>	<b>1%</b>	<b>0%</b>	<b>8%</b>	<b>2%</b>	<b>14%</b>	<b>0%</b>	<b>2%</b>	<b>9%</b>	<b>7%</b>	<b>5%</b>	<b>12%</b>	<b>4%</b>	<b>5%</b>
Number of Vessels "Losing" Trips	4	0	27	2	17	3	3	5	3	4	3	1	10
<b>Percentage of Vessels Losing Trips</b>	<b>5%</b>	<b>0%</b>	<b>18%</b>	<b>8%</b>	<b>24%</b>	<b>3%</b>	<b>12%</b>	<b>21%</b>	<b>12%</b>	<b>17%</b>	<b>14%</b>	<b>6%</b>	<b>13%</b>

**Table 9 - Estimated impacts of counting DAS as a minimum of 24 hours, by principal landing port, based on fishing year 1998**

### Summary of Impacts

The proposal will constrain the fishing activity of vessels that use a high percentage of DAS and take a large number of short trips. The impacts will be felt primarily on fleet DAS permits. Sink gillnet vessels will be most affected, though almost all gear types and permit categories will be constrained. The proposal will have little impact on the vessels that used Portland ME as their primary landing port in 1997. Nearly a third of the boats that landed in Gloucester, and about a quarter of the boats that landed in Boston, Hampton/Seabrook, Scituate, and Provincetown will be affected.

This analysis focused on the impacts of charging vessels a minimum of 24 hours on short trips. Another alternative offered is to charge vessels a minimum of 15 hours. Clearly, the impacts of charging vessels a minimum of 15 hours will be less. A quick review shows that there will be almost no impact on gillnet vessels if the minimum is charged to 15 hours, since day gillnet vessels are already subject to a 15 hour minimum.

### Discussion

Based on the previous analysis, the proposal will increase the number of DAS charged. The increase can be calculated by increasing the DAS charged for trips over 3 and less than 24 hours in length to the minimum of 24 hours. For some vessels, this would result in exceeding their DAS allocation, so the actual increase must take this into account. Table 13 shows that in 1997, the proposal would have added approximately 4,500 DAS to the boats that fished in the Gulf of Maine, an increase of 16% (without increasing actual fishing activity). The proposal would have added roughly 8,000 DAS to the overall DAS used in fishing year 1997 and 1998. These estimates take into account the fact that for some vessels, the calculated impact is capped by the DAS allocation for that vessel.

	Category					Grand Total
	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	
DAS Used	8,699	17,637	651	219	129	27,335
DAS Calculated Using Proposal	8,870	21,677	865	219	173	31,804
% increase	2%	23%	33%	0%	34%	16%

**Table 13 – Increase in DAS due to counting DAS as a 24 hour minimum, based on 1997 fishing activity (Gulf of Maine)**

	Category					Grand Total
	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	
DAS Used	15,980	30,757	1,545	596	585	49,463
DAS Calculated Using Proposal	16,026	37,775	2,214	597	673	57,286
% increase	0%	23%	43%	0%	15%	16%

**Table 14 – Increase in DAS due to counting DAS as a 24 hour minimum, based on 1997 fishing activity (all areas)**



	Category					
	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Grand Total
DAS Used	15,271	33,945	1,910	1,071	738	52,935
DAS Calculated Using Proposal	15,416	41,222	2,654	1,084	978	61,354
% increase	1%	21%	39%	1%	33%	16%

**Table 15 – Increase in DAS due to counting DAS as a 24 hour minimum, based on 1998 fishing activity (all areas)**

The analysis assumes that vessel operators will respond to this new restriction by decreasing the number of trips taken, but this is not the only possible reaction. If a fisherman takes some trips that are longer than twenty four hours, he could shorten these trips to stay within the allocated DAS while still taking the same number of trips. In effect, the fisherman compensates for the fact that short trips are charged as a minimum of twenty-four hours by shaving time off his longer trips in order to make the same number of trips. This also results in a reduction in fishing effort from observed levels.

If a vessel usually fishes a series of consecutive short trips, another way to mitigate the impacts of the proposal is by allowing the DAS clock to run when he returns to port on a short trip. For example, a bottom-trawl vessel that takes two 12-hour trips on consecutive days is charged 24 hours under the present system. Under the proposal, that vessel would be charged 48 hours. If the vessel starts his clock on the first day, and then ends it after his second trip on the second day, he will be charged less than 48 hours (the exact amount depends on the time between the start of his first trip and the end of the second trip). This could be repeated until the fisherman has to end a trip in accordance with the requirement that he call out within fourteen days of the start of a trip. The following table (Table 16) compares how the DAS would be counted under the current system, under the proposed rule as intended, and a possible response to the rule.

There is another possible reaction. A fisherman that currently takes trips of less than one day is charged for the actual time spent between call-in and call-out (or, if a day gillnet vessel, a minimum of 15 hours). A vessel that is now going to be charged a minimum of 24 hours for these trips may decide to actually fish the entire twenty-four hours, rather than be charged part of a DAS for sitting at the dock. The most likely fishermen to use this tactic would be those who expect to lose trips under the proposed regulations. Because their DAS usage is already high, these permit holders will want to minimize the impact of the regulation by increasing their time on the water on each trip, to make up for the lost trips. The impacts of this response are difficult to estimate. If a boat is already using most of its DAS, this response will not increase effort as measured either by DAS or by actual time on the water. It just means the effort will be concentrated on a fewer number of trips. A boat that is currently taking a high number of trips but is only using part of its DAS may actually increase its effort and time on the water with this response, resulting in an increase in effective effort. Finally, there are many vessels that will not exceed their DAS allocation even if this proposal is adopted. Those vessels could increase their fishing activity and reduce the overall impacts of the proposed measure.

Changing the way DAS are counted on short trips may also have safety implications. Because a vessel will be charged a full 15 or 24 hours for any trip over 3 hours in length, the operator may decide to stay at sea in worsening weather to make best use of his time.

Action	Day 1	Day 2	Day 3	Day 4
<b>Current regulations</b>				
Start trip/clock	0600	0600	0600	0600
Stop trip/clock	1600	1600	1600	1600
Cumulative hours assessed	12	24	36	48
<b>Proposed regulations</b>				
Start clock/trip	0600	0600	0600	0600
Stop trip/clock	1600	1600	1600	1600
Cumulative hours assessed	24	48	72	96
<b>Possible response to proposed regulations</b>				
Start trip	0600	0600	0600	0600
Start clock	0600		0600	
End Trip	1600	1600	1600	1600
Stop clock		1600		1600
Cumulative hours assessed		36		72

**Table 16 – Illustration of the effect of a possible response to the proposed regulation on DAS**

**PDT Comments**

1. This proposal will have some impacts on those vessels that use a large number of DAS on trips that are between 3 and 24 hours in length. For all vessels that used groundfish DAS in 1997, 28% of sink gillnet vessels, 15% of bottom longline vessels, and 11% of bottom trawl vessel would lose trips. 14% of fleet DAS permits, 8% of individual DAS permits, and 2% of hook gear permits would be impacted. The ports that would be most affected are Gloucester, Hampton/Seabrook, Chatham, Boston, and Atlantic City NJ. Sink gillnet vessels would "lose" 13% of their trips, bottom longline vessels would "lose" 11%, and bottom trawl vessels would lose 7% of their trips. The impacts are slightly smaller if estimated based on observed 1998 fishing activity. If the proposal is only applied to vessels fishing in the Gulf of Maine, based on 1997 activity of vessels that fished in the Gulf of Maine, 30% of gillnet vessels would be affected, 16% of bottom trawl vessel, and 10% of bottom longline vessels. 18% of fleet DAS permits, 9% of individual DAS permits, and 3% of hook gear –permits would be affected. The ports most

affected would be Gloucester, Portsmouth, Hampton/Seabrook, Scituate, and Provincetown – will be most affected. For sink gillnet vessels, the number of trips affected is 13%. Bottom trawl vessels would lose 9% of their trips, and bottom longline vessels would lose 6% of their trips based on observed activity in fishing year 1997.

2. The impacts of this proposal are similar to a DAS reduction for those vessels that take a large number of short trips. By increasing the minimum time charged for short trips, some vessels will exceed their DAS allocation if they try to take the same number of trips. A rough estimate is that a DAS reduction corresponding to the percentage of trips lost will have the same impacts. This is because in the analysis, a trip is equated to 24 hours at-sea.

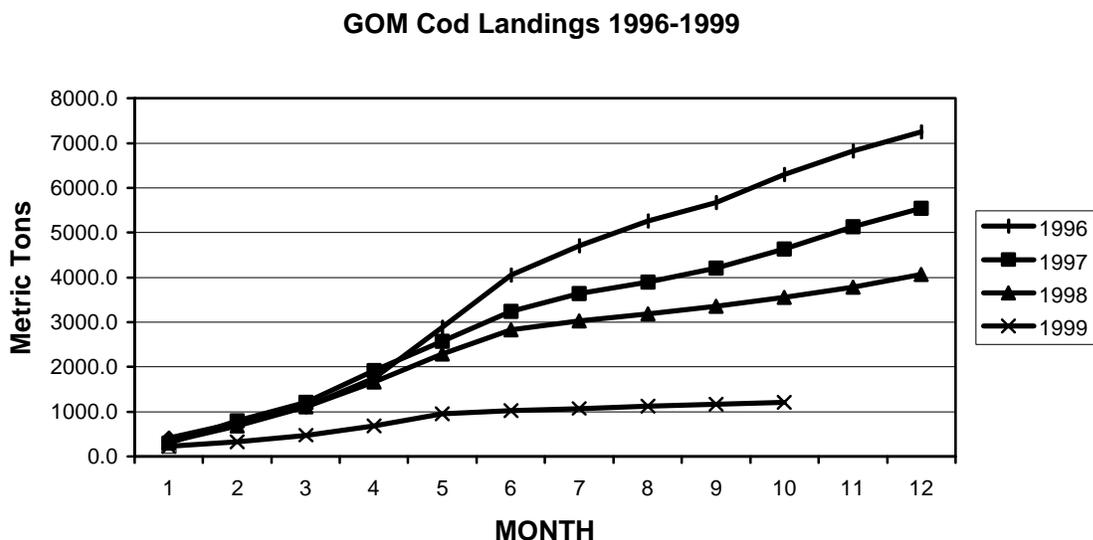
3. Analyzing DAS use for any management measure is complicated because vessels can make multiple trips during one call-in/call-out cycle, up to a maximum of 14 days. The accuracy of DAS as a measure of effort is weakened because vessels subject to the GOM cod trip limit are allowed to have extended trips of up to 14 days in length (50 CFR 648.10(f)(3)(i)). DAS no longer indicates time spent fishing, as the DAS clock can run when a vessel is at the dock. For a vessel that does not exceed the cod trip limit, it's not clear what the benefit is to allowing this activity. The PDT recommends that the regulatory text of 50 CFR 648.10(c)(3) be applied to all multispecies vessels, including those subject to the GOM trip limit. This regulation requires that at the end of a vessel trip, when a vessel returns to port, it must call in and end the trip. The definitions section of the regulations defines the end of a trip as when the vessel returns to port, not when it stops its DAS clock. Vessels should be required to call in at the end of a trip. Alternatively, the regulations could prevent a vessel from being in port if more than three hours have passed since calling in to the DAS program unless the vessel has also called the cod hail line. While not specifically related to the proposed requirement, this regulatory change would facilitate DAS analysis in the future.

4. Future analyses could be improved if a particular DAS cycle could be linked to a trip on a vessel's VTR. Since fishermen are required to record their day and time of departure and return on a VTR, it would be relatively simple to require them to record the DAS call in and call out number on this form. This would provide a way to link these two pieces of information, which would facilitate a more accurate tracking of which trips are in a particular area. Since dealers are required to provide a trip number on the dealer report, all three databases could be linked if one of the DAS numbers was used to identify trips on the dealer logbook. The PDT recommended that the DAS number be recorded on vessel and dealer logbooks by multispecies vessels, although this is not incorporated into the proposed action.

#### **4.1.1.1.2 Status quo area closures and trip limits**

Options 1 and 2 retain the same area closures and trip limits as the current management program, as implemented through Framework 31, except that Option 2 has some additional closures. The analysis of current area closures in Framework 31 and in the MSMC report incorporates the combined impacts of trip limits and area closures, as well as other measures implemented in Frameworks 26-31. This analysis (provided below) was based on landings for January – April, 1999 of 685 mt, however, more recent landings data indicate that landings for January – October were 1212 mt. This level of landings is at the low end of the range considered in this analysis, but

does not change the basic conclusions due to uncertainty about discards. Comparative landings data for the past four years are shown graphically in Figure 27.



**Figure 27 Cumulative Gulf of Maine cod landings by calendar year, 1996 – 1999 (through August, 1999)**

Frameworks 26 and 27 implemented several closures of areas with high cod catch in 1999 and dropped the trip limit from 400 lbs. to 200 lbs. to 30 lbs to 100 lbs Framework 31, effective January 5, 2000, raises the trip limit from 100 lbs. to 400 lbs. and adds a closure of 124 and 125 in February. This analysis provides an estimate of the effects of the recent management measures on fishing mortality rate on Gulf of Maine cod. The PDT cautions that the analysis does not take into account discards, which cannot be estimated at this time.

The effectiveness of the trip limits is predicated on fishermen’s behavior. Information on discarding behavior under the 400, 200, 30, and 100 pounds per day trip limits that have been implemented consecutively since June 1998 is not available. However, two extreme assumptions about the relative difference in discards under a 200 pound per day trip limit compared to the proposed 400 pounds per day limit provide bounds for a sensitivity analysis about the effect of the rolling closures and the trip limit on fishing mortality in fishing year 1999. This analysis does not address the potential increase of discards that may have occurred at either 400 pounds per day or 200 pounds per day trip limit.

The analysis provided below was done initially to estimate the impact of the increased trip limit proposed in Framework 31. Since it incorporates observed landings through April, 1999 (which are now provided through October), the analysis provides an estimate of the range of possible fishing mortality rates under the current management program (not considering discards). In Framework 31, the analysis discussion noted that if the change from a 200 pounds per day trip limit to 400 pounds per day trip limit only converts discards into landings, that is, the catch is the

same despite a difference in landings, then fishing mortality will not change under the higher limit. No difference in fishing mortality bounds one end of the problem (that is, what is the difference between trip limits of 200 and 400 pounds). If the 200 pounds per day trip limit is perfectly effective, that is, there are no additional discards beyond that generated at the 400 lbs. trip limit and catch is reduced by the lower limit, then the fishing mortality rate will be lowered by lowering the trip limit. The reduced fishing mortality rate bounds the other end of the problem.

### **Sensitivity analysis of the effect of 200 pounds per day trip limit and 400 pounds per day trip limit for January-April 2000.**

Observed landings from January 1999 to April 1999 were 685 mt. Management measures in place were 400 pounds per day trip limit, running clock with no cap, and Framework 25 and 26 closures. Framework 31 utilizes the same measures, but with a more restrictive running clock. Under the proposed system, vessels may only land overages for a partial day at sea (on trips over 24 hours) and may not land more than 4,000 pounds under any circumstances. Vessels on trips under 24 hours may not land more than 400 pounds.

The best estimate of landings in January 2000 through April 2000 with a 400 lbs. trip limit will be the landings from January 1999 through April 1999 when similar measures were in place. To be more accurate, these landings should be modified to accommodate changes in stock size (declining stock sizes should result in lower landings if CPUE and stock size are positively correlated) and implementation of a more restrictive running clock. The running clock should lower landings, but may not have an impact on actual catches because of regulatory discards. However, this analysis assumes no change in CPUE and considers landings for January-April 2000 to be 685 mt under a 400 pounds per day trip limit, equal to the same period in 1999.

The first step is to estimate the effect of the 200 pound per day trip limit assuming that the lower limit results in no discards, compared to the 400 pound per day limit. The MSMC (1998) predicted landings for 1999 of 2058 mt at a 400 pounds per day trip limit and 1300 mt at a 200 pounds per day trip limit. These estimates are slightly higher than those shown in last years' Framework 27 because they do not include the projected 7.4 percent reduction in DAS usage that was incorporated into the Framework 27 analysis. In retrospect, that reduction did not occur. The percent difference in total landings projected by the MSMC between the 200 pounds per day trip limit and 400 pounds per day trip limit is 37% from the 1998 MSMC report. Assuming that this reduction is proportional throughout the year, decreasing the trip limit to 200 pounds per day will drop expected landings in January 2000 through April 2000 to 432 mt, from 685 mt observed. The difference in expected landings will be 253 mt. The question becomes what impact does this have on F in fishing year 1999?

The 253 mt can be compared to expected total landings in 1999. One estimate of landings for 1999 under the proposed 400 pounds per day trip limit can be calculated as follows:

$$685 \text{ mt (Jan-April 99, observed)} + 267 \text{ mt (May 99, observed)} + 1827 \text{ mt (June-Dec 98, observed)} = \mathbf{2779 \text{ mt.}}$$

This estimate assumes that landings in June-Dec 99 (under the 30-100 pounds per day trip limit; June, October-November rolling closures, and July- October closure of Cashes ledge, interim

running clock) will be similar to June-Dec 98 (400 pounds per day trip limit; June closure of Cashes and blocks 145-147,152; one month northeast closure, and full running clock). This estimate may be considered pessimistic because it assumes no benefit for the additional Framework 27 measures and for purposes of this analysis may be an upper bound of landings in 1999.

The estimate for total landings with the 200 pounds per day trip limit is:

$$432 \text{ mt (Jan-April 99, from Step 1)} + 267 \text{ mt (May 99, observed)} + 1827 \text{ mt (June-Dec 98, observed)} = \mathbf{2526 \text{ mt.}}$$

These results are presented below as the “pessimistic scenario”.

A similar exercise can be done applying the ratio of Landings<sub>(January to May 1999)</sub>/ Landings<sub>(January to May 1998)</sub> to total 1998 landings. This method assumes that the percent reduction in landings that occur from January-May 1999 will occur from June-December 1999. This estimate is **1668** mt under the 400 pounds per day trip limit. This estimate may be considered optimistic because it assumes the same percent reduction in the second half of the year as occurred in the first half, even though most of the closures occur in the first half of the year. Subtracting the 253 mt difference, from Step 1, produces expected landings of **1435** mt under a 200 pounds per day per day trip limit. This is presented below as the “optimistic scenario”.

The projected fishing mortality at these assumed landings can be estimated by using 1999 survivors from the Northern Demersal Working Group assessment (August, 1999) assuming 1998 partial recruitment and mean weights for 1999, and iterating F until expected landings are achieved. This uses similar methodology that the MSMC has used to estimate projected F with the exception that this calculation is deterministic and does not incorporate uncertainty in terminal year population estimates. Results are shown in Table 17.

Trip limit	Pessimistic scenario		Optimistic scenario	
	Landings	Expected F	Landings	Expected F
200 lbs.	2,526 mts.	0.35	1,435 mts.	0.19
400 lbs.	2,779 mts.	0.39	1,668 mts.	0.22

**Table 17 Results of sensitivity analysis on impact of 200 pounds per day and 400 pounds per day trip limit on F in fishing year 1999.**

The analysis suggests that under a range of assumptions about potential discards at the lower limit and either a 200 lbs or trip limit to 400 pounds per day in January-April 2000 landings are likely to be between 1,435 and 2,779 metric tons. These landings will result in a fishing mortality that likely to be between 0.39 to 0.19, substantially lower than the 1998 F. Averaging the pessimistic and optimistic scenarios results in landings of 2,102 and a fishing mortality rate of 0.29.

**This analysis suggests that Fishing mortality in fishing year 1999 may be near the  $F_{max}$  target under Frameworks 26, 27 and proposed Framework 31.** The fact that landings through

October, 1999 suggest the full-year landings will be at the lowest end of the range in this analysis doesn't change the conclusions about the expected fishing mortality rate in 1999 because of uncertainty about discards. The fishing mortality rate may be underestimated if substantial discarding occurred (that is, catch remains high despite a drop in landings). This analysis also does not incorporate uncertainty in the terminal year population estimates going into the projection.

**4.1.1.1.3 Option 1 Layover days and net tag limit May, June, July, Nov. and Dec.**

The Council rejected Option 1. The MSMC proposed this measure as a way to slow the “pulse” of fishing effort following the re-opening of the rolling closures. In 1999, it was during this period that fishermen reported extremely high catch rates and discards of cod. Analysis of 1999 effort patterns during the eight weeks following a re-opening support the contention that there is a pulse of effort and landings during the first month. Table 18 shows that in terms of numbers of trips, the first four weeks has significantly more trips than the second four weeks following a re-opening. By gear category, the greatest change is in the number of otter trawl trips.

<b>BLOCKS</b>	<b>First 4 weeks (# trips)</b>	<b>Second 4 weeks (# trips)</b>	<b>% decline</b>
<b>121-125</b>	693	501	-27%
<b>129-133, 136-138</b>	895	607	-32%
<b>139, 140, 142-147</b>	185	120	-35%

**Table 18 Number of trips in re-opened rolling closure areas in 1999, first and second four weeks.**

While trip length appears to remain constant throughout the eight-week period, the average trip length in the nearshore blocks of each closure area (124, 125, 132, 133, and 134) is, understandably, significantly lower than the offshore component, and averages between 0.5 and 0.7 days. If the layover provision requires a minimum of a 24-hour layover, then this proposal will have the effect of slowing the pulse of effort on inshore vessels by limiting their ability to make frequent short trips and landing the per day limit of cod. The landings by these vessels could be reduced by as much as 50 percent during those months, if the vessel otherwise would fish every day without the layover constraint. However, some of those fish would be caught in subsequent months, reducing the impact on fishing mortality to something less than 50 percent.

Table 19 shows the percent change in landings of cod and all species during between the first four weeks and the second four weeks following the re-opening of the GOM rolling closures in 1999. Nearly all gears showed significant reductions in landings of cod and all species during the second eight weeks. The exception being gillnet vessels which showed less significant reductions (and an increase in one case) in all species landed, and also showed an increase in cod landed in one instance. Under this proposal, however, Day Gillnet vessels would not be subject to layover days, but to a limit of 40 stand-up nets (80 net tags) compared to the regular limitation of 80 nets. While a 50 percent reduction in allowed nets during this period would reduce the catch by Day Gillnet vessels, the relative impact to the regular number of nets and to the effect of layover days on other gear sectors cannot be quantified.

<b>Percent Change</b>	<b>Otter Trawl</b>	<b>Gillnet</b>	<b>Hook</b>	<b>All</b>
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Blocks	Cod	All	Cod	All	Cod	All	
121-125	-53	-40	-69	-9	-88	-79	-39
129-133, 136-138	-58	-58	-51	+129	-74	-63	-43
139, 140, 142-147	-22	-43	+92	-25	NA	NA	-42

**Table 19 Percent change in landings (VTR data) between the first four weeks and the second four weeks following the re-opening of GOM rolling closures in 1999, by gear and by cod and all species.**

Table 20, Table 21, and Table 22 show the multispecies landings for the eight consecutive weeks following the re-opening of the rolling closures in 1999, by gear and species. These data suggest that a layover day provision would reduce the pulse fishing, and therefore landings, during the period immediately following the re-opening.

GEAR		Week Number								Total LBS
		1	2	3	4	5	6	7	8	
OTTER TRAWL	Cod	6,091	31,568	51,038	49,522	18,893	10,586	25,980	9,038	202,716
	Dab	4,379	33,138	51,248	26,978	19,809	14,700	18,788	10,516	179,556
	Grey Sole	837	8,658	24,491	15,720	7,028	7,584	18,921	8,185	91,424
	Haddock		82	649	321	285	234	14,922	2,398	18,891
	Pollock	75	1,206	6,545	11,472	862	2,632	6,028	4,150	32,970
	Redfish	3	63	1,076	13,724	84	67	2,293	1,856	19,166
	White Hake		25	500		700	3,282	1,245	100	5,852
	Windowpane Flounder		82	29	37	20	30			198
	Winter Flounder	1,147	6,661	6,186	2,580	1,801	2,843	2,060	1,107	24,385
	Yellowtail Flounder	8,169	42,633	34,705	19,247	13,635	19,124	12,867	10,102	160,482
<b>OTTER TRAWL Total</b>		<b>20,701</b>	<b>124,116</b>	<b>176,467</b>	<b>139,601</b>	<b>63,117</b>	<b>61,082</b>	<b>103,104</b>	<b>47,452</b>	<b>735,640</b>
GILLNET	Cod	465	16,091	11,269	6,930	6,106	1,607	1,668	1,332	45,468
	Dab		7,944	6,276	4,707	3,243	2,249	2,939	1,338	28,696
	Grey Sole		303	369	1,056	1,613	2,352	3,588	1,485	10,766
	Haddock		265	65	193	181	49	38	10	801
	Pollock	60	4,521	331	309	1,113	177	440	46	6,997
	Redfish		345			130				475
	White Hake		9			24		4		37
	Windowpane Flounder							5	30	35
	Winter Flounder		15,836	13,326	9,181	6,518	8,465	5,221	4,392	62,939
	Yellowtail Flounder		18,988	21,752	20,593	15,381	15,046	12,663	12,425	116,848
<b>GILLNET Total</b>		<b>525</b>	<b>64,302</b>	<b>53,388</b>	<b>42,969</b>	<b>34,309</b>	<b>29,945</b>	<b>26,566</b>	<b>21,058</b>	<b>273,062</b>
HOOK	Cod	660	2,475	500	2,816	256	358	90	83	7,238
	Haddock	305	239	865	348	141	387	305	70	2,660
	Pollock	12	40	60	21		10	45		188
<b>HOOK Total</b>		<b>977</b>	<b>2,754</b>	<b>1,425</b>	<b>3,185</b>	<b>397</b>	<b>755</b>	<b>440</b>	<b>153</b>	<b>10,086</b>
OTHER	Cod	1,035	2,003	2,238	2,952	2,378	262	86	74	11,028
	Dab				579	250				829
	Grey Sole				50	200				250
	Pollock	102	51	156	233	43				585
	Winter Flounder				214	15				229
Yellowtail Flounder				123	25				148	
<b>OTHER Total</b>		<b>1,137</b>	<b>2,054</b>	<b>2,394</b>	<b>4,151</b>	<b>2,911</b>	<b>262</b>	<b>86</b>	<b>74</b>	<b>13,069</b>
<b>Grand Total</b>		<b>23,340</b>	<b>193,226</b>	<b>233,674</b>	<b>189,906</b>	<b>100,734</b>	<b>92,044</b>	<b>130,196</b>	<b>68,737</b>	<b>1,031,857</b>

Source: VTR Database (12/6/99)

**Table 20 Multispecies landings for the eight consecutive weeks following May 1, 1999 for Blocks 121-125**

GEAR		Week Number								Total LBS
		6	7	8	9	10	11	12	13	
OTTER TRAWL	Cod	8,446	6,799	6,857	6,441	2,952	2,508	3,956	2,391	40,350
	Dab	101,998	87,646	85,551	91,498	42,961	35,363	48,876	22,008	515,901
	Grey Sole	48,144	48,740	59,874	56,052	17,379	22,021	30,767	23,566	306,543
	Haddock	1,400	1,522	2,880	1,957	8,119	309	3,183	185	19,555
	Pollock	1,632	4,904	4,633	9,326	2,207	946	6,025	2,523	32,196
	Redfish	387	770	2,037	4,668	984	212	1,072	408	10,538
	White Hake	2,012	1,828	4,258	9,528	2,666	2,051	6,298	2,482	31,123
	Windowpane Flounder		65							65
	Winter Flounder	1,490	711	824	464	470	167	291	164	4,581
	Yellowtail Flounder	29,326	18,246	12,103	10,239	4,809	4,195	4,016	2,503	85,437
<b>OTTER TRAWL Total</b>		<b>194,835</b>	<b>171,231</b>	<b>179,017</b>	<b>190,173</b>	<b>82,547</b>	<b>67,772</b>	<b>104,484</b>	<b>56,230</b>	<b>1,046,289</b>
GILLNET	Cod	673	1,434	1,470	1,857	3,259	1,567	1,861	1,535	13,656
	Dab	872	2,770	1,446	1,163	7,593	1,020	547	999	16,410
	Grey Sole	425	1,216	1,240	807	264	457	301	402	5,112
	Haddock	487	819	585	1,494	1,274	794	1,313	1,087	7,853
	Pollock	1,004	3,176	7,605	17,368	21,064	10,290	32,552	27,207	120,266
	Redfish	1	100	127	76	100	200	20	700	1,324
	White Hake		175		1,020	4,800	759	6,469	6,615	19,838
	Winter Flounder	427	952	707	543	471	598	294	184	4,176
	Yellowtail Flounder	577	3,424	3,714	1,221	566	1,511	318	932	12,263
	<b>GILLNET Total</b>		<b>4,466</b>	<b>14,066</b>	<b>16,894</b>	<b>25,549</b>	<b>39,391</b>	<b>17,196</b>	<b>43,675</b>	<b>39,661</b>
HOOK	Cod	124	121	128	90	120				583
	Haddock	73	57	1,202	400	700				2,432
	Pollock	7	14	300	500	300				1,121
	Redfish	2								2
<b>HOOK Total</b>		<b>206</b>	<b>192</b>	<b>1,630</b>	<b>990</b>	<b>1,120</b>				<b>4,138</b>
OTHER	Cod	400	194	303	472	589	675	921	119	3,673
	Dab						38			38
	Grey Sole						212	3		215
	Haddock		59	3		167	12	1,500	2	1,743
	Pollock		15	76	543	291	24	3,520		4,469
	Redfish							38		38
	Yellowtail Flounder						87			87
<b>OTHER Total</b>		<b>400</b>	<b>268</b>	<b>382</b>	<b>1,015</b>	<b>1,047</b>	<b>1,048</b>	<b>5,982</b>	<b>121</b>	<b>10,263</b>
<b>Grand Total</b>		<b>199,907</b>	<b>185,757</b>	<b>197,923</b>	<b>217,727</b>	<b>124,105</b>	<b>86,016</b>	<b>154,141</b>	<b>96,012</b>	<b>1,261,588</b>

Source: VTR Database (12/6/99)

**Table 21 Multispecies landings for the eight consecutive weeks following June 1, 1999 for Blocks 129-133, 136-138**

GEAR	Fishing Week Number									Total LBS
	10	11	12	13	14	15	16	17		
OTTER TRAWL	Cod	935	2,034	1,825	1,252	1,207	1,750	1,265	474	10,742
	Dab	13,584	30,534	34,041	19,142	16,026	13,380	17,031	11,001	154,739
	Grey Sole	4,041	8,733	20,022	15,715	9,315	8,221	10,068	7,233	83,348
	Haddock	6,751	4,535	460	55	76	60	444	5	12,386
	Pollock	1,164	5,352	2,514	2,171	3,715	915	789	459	17,079
	Redfish	21	2,228	652	287	308	55	476	20	4,047
	White Hake	1,485	4,549	2,875	2,810	3,235	530	480	775	16,739
	Windowpane Flounder		442	746	322	305	50	100		1,965
	Winter Flounder	9	101	831	53	73	66	40	15	1,188
	Yellowtail Flounder	287	828	470	208	90	220	74	10	2,187
<b>OTTER TRAWL Total</b>	<b>28,277</b>	<b>59,336</b>	<b>64,436</b>	<b>42,015</b>	<b>34,350</b>	<b>25,247</b>	<b>30,767</b>	<b>19,992</b>	<b>304,420</b>	
GILLNET	Cod	155	525	422	495	510	640	758	1,152	4,657
	Dab	50	31	28	15	31	15	1	19	190
	Grey Sole	70	1	10	10	25	3		18	137
	Haddock	715	225	473	639	230		95	5	2,382
	Pollock	145	9,985	5,171	3,613	7,940	2,735	2,230	2,917	34,736
	Redfish		50	75	107	85	65	25	80	487
	White Hake	35	7,405	2,145	1,685	2,165	1,535	1,150	1,155	17,275
	Windowpane Flounder	10	15	36	6	15				82
	Winter Flounder	35	21	18	45	20	30	10		179
	Yellowtail Flounder	25	24	6	10					65
<b>GILLNET Total</b>	<b>1,240</b>	<b>18,282</b>	<b>8,384</b>	<b>6,625</b>	<b>11,021</b>	<b>5,023</b>	<b>4,269</b>	<b>5,346</b>	<b>60,190</b>	
OTHER	Cod		99	99	78	11		158	81	526
	Dab			1,861						1,861
	Grey Sole			211						211
	Haddock	2		11				8	7	28
	Pollock		3,568	346		14		110	30	4,068
	Redfish			134				2		136
	White Hake								1	1
<b>OTHER Total</b>	<b>2</b>	<b>3,667</b>	<b>2,662</b>	<b>78</b>	<b>25</b>		<b>278</b>	<b>119</b>	<b>6,831</b>	
<b>Grand Total</b>	<b>29,519</b>	<b>81,285</b>	<b>75,482</b>	<b>48,718</b>	<b>45,396</b>	<b>30,270</b>	<b>35,314</b>	<b>25,457</b>	<b>371,441</b>	

Source: VTR Database (12/6/99)

**Table 22 Multispecies landings for the eight consecutive weeks following July 1, 1999 for Blocks 139, 140, 142-147**

#### 4.1.1.1.4 Option 2 additional area closures

Option 2 contained two additional area closure proposals to insure that that target fishing mortality rate is not exceeded. One option (the proposed action) would implement closures of the Cashes Ledge area in November and Blocks 124 and 125 in January if 50 percent of the target TAC is landed by July 31. A second option (rejected) would have closed the northern half of Block 124 year-round.

**Impact of the triggered closure of Cashes Ledge and Blocks 124 and 125:** The 1999 landings of GOM cod for the May – July period were approximately 385 metric tons, under trip limits of 200 pounds per day and 30 pounds per day (after May 28, 1999). These landings cannot be used to project 2000 landings under a 400 pound per day trip limit, as there is insufficient discard information. However, the following analysis can illustrate the impact of the proposed closures if they were to take effect.

In previous analyses, the method used to calculate the Cashes Ledge Closed Area impact was to use one-half of the landings of blocks 129 and 130. Using 1997 data, from before the closure was implemented, the November closure of this area would affect 40 metric tons of cod. While this is less than one percent of the total GOM cod landings, it is the highest single month of cod landings from that area. For comparison, the July – October period accounted for 113 metric tons. November landings are likely to be significantly higher following the reopening of the area that has been closed for four months, both in absolute terms and as a percentage of the total. Therefore, the closure of this area for one additional month should have a positive impact on cod conservation, protecting aggregated fish during the peak landings month. The December landings in 1997 declined by nearly 50 percent from November, therefore, it is unlikely this measure will simply delay by one month the high level of catch expected in November if the area were to remain open.

The January closure of Blocks 124 and 125 would start the spawning period closure of this area one month early. These blocks would be closed for four months, until May 1, and then for two additional months in the fall, October and November. While January accounted for only seven percent of the landings from this area in 1997, the month is important to protecting spawning aggregations of cod. The low level of total landings is partially attributable to reduced levels of effort during this time, due to weather, and does not reflect a lower importance of this month in protecting concentrations of spawning fish.

**Impact of a year round closure of the northern half of Block 124:** Option 2 contained a proposal to close the northern half of Block 124 year-round. Based on NMFS bottom trawl survey data, observer data and VTR data, the northern half of 124 has the highest concentration of cod and accounts for the greatest portion of the catch compared to the southern half. As a portion of the total GOM cod catch in 1998, based on VTR data prorated to the dealer database landings, approximately 26 percent of all GOM cod landings came from the northern half of Block 124.

This area, which encompasses the northern part of Stellwagen Bank, is heavily fished due to its resource abundance and proximity to Massachusetts fishing ports from Gloucester to Provincetown. Both large and small boats, of all gear types are able to fish this area. A year round closure of this area would likely significantly reduce the landings of GOM cod, but since DAS data cannot be distributed at the precision of 1/2 blocks, the amount of effort that would be displaced cannot be calculated. The displaced effort would have the effect of reducing the net impact of the closure. However, since this area has some of the highest cod catch rates, the effect of a year round closure would likely be that total discard levels would be reduced somewhat.

#### **4.1.1.1.5 Options 1 and 2 exemption for the raised footrope trawl**

Since NMFS disapproved the MA DMF proposal for an exempted fishery for the raised footrope trawl, the Council deferred discussion of any area closure exemption until it considers the overall exempted fishery. The two raised footrope trawl alternatives that the Council considered for Framework 33 only apply to Options 1 and 2, as Options 3 and 4 do not affect the operation of the fishery. The closure of Block 124 in Option 3 is specific to the northern half of the block where the raised footrope trawl fishery will not occur. In addition, the timing of the Option 3 closures does not overlap with the timing for the raised footrope trawl fishery. None of the closures proposed in Option 4 interfere with the raised footrope trawl fishery either; the year-round closures are north of 42° 15', and the seasonal closures do not conflict with the fishery in terms of timing. Therefore, this analysis should be considered only in the context of Framework 33 Options 1 and 2.

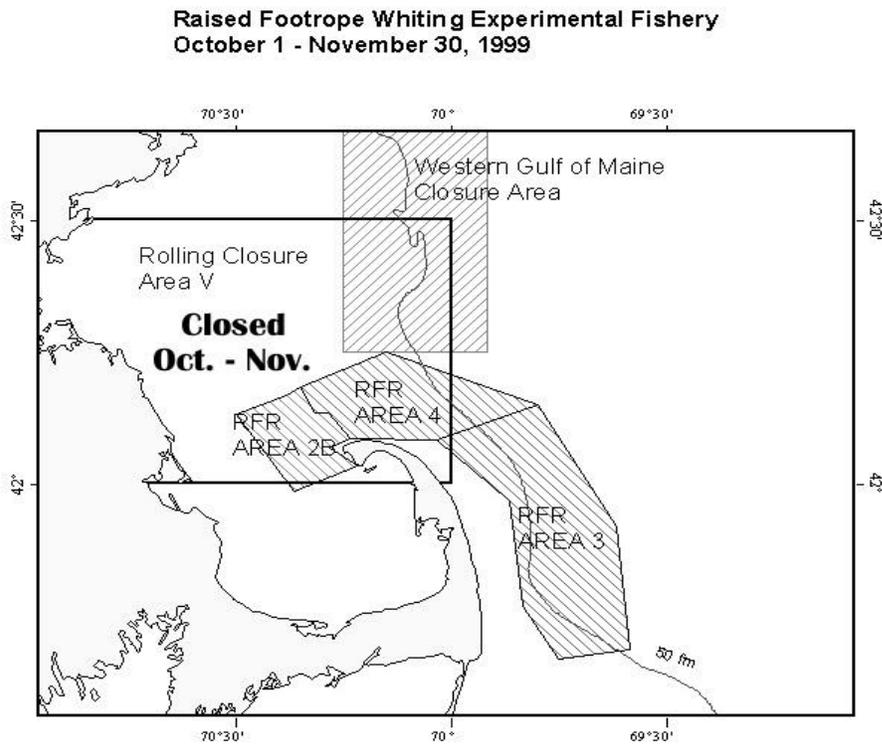
**Options:** The Council is considering two options for exempting the whiting raised footrope trawl fishery from the Gulf of Maine closed areas proposed in Framework 33: (1) allowing the raised footrope trawl fishery to occur within the Gulf of Maine closed areas and (2) closing only the northern half of Blocks 124 and 125 during the times when the closure of these blocks overlaps with the raised footrope trawl fishery.

**Fishery Background:** The raised footrope trawl fishery is an experimental fishery conducted in the southern Gulf of Maine that primarily targets whiting and red hake as well as dogfish. Since 1995, the Massachusetts Division of Marine Fisheries (DMF) has sought to establish a small mesh exemption area in northern Cape Cod Bay to provide an opportunity for small mesh (whiting) fishing under groundfish regulations. This requires compliance with the 5% groundfish bycatch standard. To establish compliance, DMF developed the raised footrope trawl and has tested it through NMFS' experimental fishery program for four years. The raised footrope trawl is designed to fish 1-2 feet above the ocean floor, and when combined with a 2.5-inch or 3-inch codend, it retains larger sizes of whiting, red hake, and dogfish. The net design capitalizes on fishes' variable habitat preferences and swimming behaviors and is designed to avoid the catch of flatfish. The trawl's most innovative feature is a chain sweep that is longer than the footrope. The chain sweep contacts the seafloor after the footrope has already passed. Therefore, slow-swimming demersal fishes and most invertebrates, if disturbed by the sweep, are not able to enter the mouth of the net because it has already passed over them.

Although DMF is interested in exploring its viability during the summer months, the raised footrope trawl experimental fishery is primarily a fall fishery. From 1996-1999, the experimental

fishery was conducted from September-November with some limited participation during December. The most productive months for the fishery are October and November. Most vessels engaged in the raised footrope trawl fishery are from Provincetown (MA), Chatham (MA), and Gloucester (MA). For Provincetown, this fishery represents the fleet's "bread and butter" for the fall and early winter.

Massachusetts DMF has worked closely with the fishing industry to explore different areas in the Gulf of Maine for this experimental fishery. Over time, participants in the fishery have helped DMF to streamline some of the experimental areas and eliminate areas where the bycatch of groundfish, especially cod, could present a problem. From this cooperative work, DMF and the industry have identified specific areas where the majority of the raised footrope trawl fishery can be effectively conducted with minimal regulated species bycatch. These areas are illustrated as Areas 2B and 4 in Figure 28 and are of particular interest to participants in the raised footrope trawl fishery. Areas 2B and 4 fall entirely within the southern half of Blocks 124 and 125 (south of 42° 15').



**Figure 28 Raised Footrope Trawl Experimental Fishery Areas and Rolling Closure Area V (Blocks 124 and 125). Note: Areas 2B and 4 are of primary concern for raised footrope trawl fishery participants.**

For more information about the raised footrope trawl fishery background and design, see the annual reports (1996-1998, 1999 pending) on the southern Gulf of Maine raised footrope trawl experimental whiting fishery, available through the Massachusetts DMF.

**Supporting Information:** The following information characterizes the amount and type of groundfish bycatch that has been observed in the raised footrope trawl fishery between 1996 and 1999. These data confirm that the raised footrope trawl has operated effectively in Areas 2B and 4 with less than 5% groundfish bycatch. Additional information provided in this section supports the notion that Atlantic cod is more concentrated in the northern half of Block 124 (where the raised footrope trawl fishery does not occur) and that protection of the northern half of the block is more critical for the recovery of the Gulf of Maine cod stock than protection of the southern half of the block.

**Groundfish Bycatch Information:** DMF has conducted sea sampling trips in the raised footrope trawl fishery for four years in hopes of obtaining adequate data to meet the 5% groundfish bycatch standard for an exempted fishery. In 1996, DMF conducted 20 sea sampling trips in Area 2B. For those 20 trips, cod bycatch was reported to comprise 0.04% of the total catch. In addition, total regulated species bycatch was well below 5% for those 20 observed trips in 1996.

Table 23 reports catch and bycatch information for about 24 sea sampling trips during the 1997 experimental fishery. For both areas, regulated species catch averaged less than 5%. Most groundfish that were caught were flatfish species (winter flounder, plaice), but overall, the fishery operated in these areas with very little bycatch during 1997.

	<b>AREA 2B</b>	<b>AREA 4</b>
Sampling Period	9/14-11/19	10/24-11/20
Total Catch (pounds)	79,322	6,145
Regulated Species Catch	3,396	19
<b>PERCENT REGULATED SPECIES</b>	<b>4.3%</b>	<b>0.3%</b>
<b>Catch Rates (Lbs./Hour):</b>		
Whiting	268	219
Red Hake	87	22
Winter Flounder	13	0
American Plaice	9	0
Yellowtail Flounder	<1	<1
Atlantic Cod	2	1
White Hake	2	0
Haddock	0	0
Pollock	0	0
<b>Total Flatfish Catch Rate (lbs./hr)</b>	<b>24</b>	<b>&lt;1</b>
<b>Total Roundfish Catch Rate (lbs./hr)</b>	<b>4</b>	<b>1</b>

**Table 23 Data from 24 Sea Sampling Trips in 1997 Raised Footrope Trawl Fishery**

Table 24 reports catch and bycatch information for about 43 tows observed on sea sampling trips during the 1998 experimental fishery in Areas 2B and 4. For both areas, regulated species catch averaged well below 5%. While cod comprised the largest percentage of regulated species

bycatch, overall, the raised footrope trawl operated successfully in these areas with minimal interaction with regulated multispecies.

	<b>AREA 2B</b>	<b>AREA 4</b>
Sampling Period	10/5-11/12	10/5-11/19
Total Catch (pounds)	39,785	20,932
Regulated Species Catch	1,107	295
<b>PERCENT REGULATED SPECIES</b>	<b>2.8%</b>	<b>1.4%</b>
<b>Catch Rates (Lbs./Hour):</b>		
Whiting	569	796
Red Hake	19	0
Winter Flounder	4	3
American Plaice	2	0
Yellowtail Flounder	2	2
Atlantic Cod	6	6
White Hake	0	0
Haddock	0	0
Pollock	0	0
<b>Total Flatfish Catch Rate (lbs./hr)</b>	<b>9</b>	<b>5</b>
<b>Total Roundfish Catch Rate (lbs./hr)</b>	<b>6</b>	<b>6</b>

**Table 24 Data from 43 Sea Sampling Tows in 1998 Raised Footrope Trawl Fishery**

The 1999 experimental fishery has been completed, and DMF is currently assimilating and summarizing the data. Sea sampling and data collection from this fishery was at a high during the 1999 season, and DMF anticipates having more and better information than ever on both whiting catches and groundfish bycatch. The 1999 experimental fishery information should be available for inclusion in the final Framework 33 document.

**Cod Distribution in Block 124:** The Northeast Fisheries Science Center provided the Council with an analysis of Atlantic cod distribution in Block 124 (Wigley and Brown, NEFSC). The Science Center reviewed information from spring and autumn research vessel surveys, domestic sea sampling data, and commercial logbook data (VTR) with an emphasis on 1998.

Tows were made at a total of 30 stations during the autumn survey (1995-1999) and 24 stations during the spring survey (1994-1998) in Block 124. The overall catch rate of cod in the northern half of Block 124 was 10.4 times greater than it was in the southern half (21.9 kg/tow vs. 2.1 kg/tow) during the spring survey. During the autumn survey, the overall catch rate in the northern half was 5.1 times greater than it was in the southern half (12.8 kg/tow vs. 2.5 kg/tow). Distribution plots show that cod are most concentrated in the northwest and west-central portions of Block 124.

Three gear types accounted for all cod catch examined in the sea sampling database: gillnet, otter trawl, and scallop dredge. A total of 24,802 pounds of cod were caught on these observed trips,

primarily by gillnet vessels. Of the total observed cod catch, about 3% came from the southern half of Block 124.

In 1998, a total of 11,120 metric tons of Atlantic cod were reported as landings in the dealer weighout database (all stocks and all areas). Of this total, only 6,875.5 mt (62%) can be accurately cross-referenced with VTRs to obtain information on “area fished.” Eleven percent of this VTR data was reported to have been caught in Block 124 during 1998. About 14% of the landings from Block 124 came from the southern half of the block. If these landings are expanded to the dealer database total, then the landings in the southern half of Block 124 would account for about 2% of all cod landings and about 4% of the total landings for the Gulf of Maine cod stock.

**Comparative Analysis of Framework 33 Options:** The following two options for the raised footrope trawl fishery were compared and evaluated based on potential biological impacts, potential economic impacts, administration, enforcement, bycatch, and data acquisition:

- (1) Exempting participants in the raised footrope trawl fishery from the Gulf of Maine closed areas that overlap with the timing of the fishery (during the fall in Blocks 124 and 125)
- (2) Closing only the northern half of Blocks 124 and 125 (where applicable) so that the raised footrope trawl fishery area would remain open to all types of fishing.

Table 25 compares the two framework options and characterizes the differences in their potential impacts. A “+” denotes that the option is likely to produce a *more positive* benefit than the other option for the category under consideration. A “-“denotes that the option is likely to produce a *more negative* benefit than the other option for the category under consideration. Additional comments are provided to help characterize the differences between the likely impacts of the two alternatives under consideration.

	<b>Biological Impact</b>	<b>Economic Impact</b>	<b>Administration</b>	<b>Enforcement</b>	<b>Bycatch</b>	<b>Data Acquisition</b>
<b>Option 1: Exempt from Closed Area</b>	<b>+</b> prevents other vessels from fishing in area and targeting reg. spp	<b>+</b> provides opportunity for small mesh boats to remain viable in the GOM during fall and winter- offers alternative fishery for boats that can catch whiting	<b>-</b> would likely require a call-in program and exemption certificates, similar to the Cultivator Shoal whiting fishery – increases administrative burden	<b>-</b> difficult to identify rft vessels from a distance – would require increased monitoring to distinguish rft vessels from other vessels in the area	<b>+</b> more positive than Option 2- reg. spp bycatch with rft unlikely to exceed 5% - overall catch of reg. spp will be lower	<b>+</b> exemption program could allow for better info on vessels in the rft fishery – no. and type of vessels and better time-specific data
<b>Option 2: Move boundary of closed area</b>	<b>-</b> allows all boats to access the area and potentially target reg. spp– does not offer the same protection to reg. spp as Option 1	<b>+</b> provides more opportunity for all vessels that historically fish in that area (for all species) to remain viable in the GOM during fall and winter	<b>+</b> eliminates necessity to monitor which vessels are in the area – would not require a certification program	<b>+</b> does not require additional monitoring to distinguish rft vessels from other vessels fishing in the area	<b>-</b> more negative than Option 1–likely to result in greater overall catch of reg. spp	<b>-</b> no mechanism to monitor the activities of vessels in the rft fishery or in other fisheries in the area-no chance to get better data through the program

**Table 25 Comparative Analysis of Raised Footrope Trawl Options Under Consideration**

\* “reg. spp” refers to the ten regulated groundfish species; “rft” refers to the raised footrope trawl fishery

**Summary and Conclusions:** The raised footrope trawl significantly reduces the bycatch of most regulated groundfish species while not compromising the catch of target small mesh species, an accomplishment for which the Council commends the fishing industry and the Massachusetts DMF. The Council believes that the development of the raised footrope trawl demonstrates the creativity and innovation that will keep the small mesh fishing fleet in the Gulf of Maine viable now and in the future. In turn, the Council wants to provide these vessels with an opportunity to catch whiting in the Gulf of Maine during the fall and winter. The Provincetown dayboats in particular are critically dependent on nearshore access to whiting fishing grounds.

The Council already formally voiced its support for the continuation of the raised footrope trawl fishery on several occasions (discussion at Committee and Council meetings, letters to NMFS). The two options under consideration in this framework adjustment confirm the Council's intent to allow the raised footrope trawl fishery to occur in Areas 2B and 4. Supporting data suggest that Options 1 and 2 are both reasonable alternatives for allowing continued access to small mesh resources in the Gulf of Maine. If the Council selects Options 1 or 2 for Framework 33, then it should compare the two raised footrope trawl alternatives and weigh their individual costs and benefits to select the final option for inclusion in this framework adjustment.

#### **4.1.1.2 Impact of Option 3**

The Council rejected Option 3 because it did not meet the biological objectives of the FMP.

##### **4.1.1.2.1 Impact of area closures and trip limits**

This option shares many of the same elements as Option 4. Consequently, analysis of the impacts faces the same difficulties as described in the following section (Option 4 analysis of impacts). This option does not benefit from the 25 DAS/trips limitation during February – May that is in Option 4. Also, this option proposes a closure of the northern half of Block 124 March-August instead of the Area III closure (year-round) in Option 4. The impact of this measure on cod catches would be less than what is calculated for the Option 4 closure because the analysis of Option 4 is based on landings from the entire northern half of Block 124 (due to data limitations), and the duration of the closure is less. The third main difference between the two options is that this option proposes to increase the minimum size of cod from 19 inches to 21 inches (which would apply to all cod not just in the Gulf of Maine). The impact of the increase in the cod minimum size is discussed in Section 4.1.3 below.

Based on the analysis of Option 4 and the other elements described above, this option would not meet the plan objectives and restrain cod landings to below the TAC.

#### **4.1.1.3 Impact of Option 4**

The Council rejected Option 4 because it did not meet the biological objectives of the FMP. Option 4 proposed to modify current area closures in the Gulf of Maine and limit the number of DAS or trips a vessel can take in the western Gulf of Maine during February – May. Like the other options, this option also proposed a 400 pounds per day cod trip limit, however it would reinstate the running clock (except during the February – May period).

##### **4.1.1.3.1 Analysis of February – May DAS/trips limitation**

Option 4 includes a proposal to limit vessels fishing in the Western Gulf of Maine Restricted Fishery Program (see Figure 4) to 25 DAS or trips (call in/out cycles), whichever is less, during February through May (actually, in the fishing year, the restriction would apply during May and February – April, and is analyzed as such). Initially, this proposal applied to all multispecies vessels and subsequently, as an option in Framework 31, it applied to the Gulf of Maine. The following section includes both the original analysis, covering all multispecies vessels, as well as the analysis done excluding vessels that did not fish in the Gulf of Maine during the months of February – May. The impact of the current proposal would be less than that calculated for the entire Gulf of Maine because it would apply to a smaller area and would allow vessels to continue to fish outside of the area, and catch Gulf of Maine cod, when not enrolled in the exemption program. The difference between the impacts of the current proposal and the whole Gulf of Maine proposal have not been analyzed. While the current proposal has less than a 5-7 percent impact on GOM cod landings, the PDT agreed that the concept of seasonal DAS reductions, at some level, should be explored as a strategy for reducing fishing effort during the period of highest landings-per-unit effort on a target stock, especially if overall DAS reductions are not an acceptable approach.

The number of days-at-sea (DAS) used by vessels with limited access multispecies permits is summarized below. Data is based on those vessels that called into the DAS system during the 1997 and 1998 fishing years. Buyout vessels are included in the 1997 fishing year data. There are minor differences in this data and data included in the 1998 Multispecies Monitoring Committee Report; the reason for the differences have not been determined, but are likely due to revisions to the databases that are made over time. There are also minor differences between the annual summaries in the overview and the monthly breakdowns. These differences total 28 DAS in the 1998 fishing year and 16 DAS in the 1997 fishing year.

In this data, a trip is defined as one call-in/call-out cycle, regardless of the number of landings made during that period. DAS were allocated to the month actually used. For trips that extended over the end of a month, the DAS were calculated for each month and the resulting proportion used to allocate part of the trip to each month.

### **Overview**

Table 26 summarizes multispecies days-at-sea (DAS) used in fishing years 1996 through 1998. Data for 1996 is from the 1998 Multispecies Monitoring Committee (MSMC) Report. Data for 1997 and 1998 was generated using DAS information provided by NMFS Northeast Region Law Enforcement staff. The data for 1997 shown here differs slightly from that in the 1998 MSMC report.

In 1998, the number of permits allocated DAS declined to 1,636 from 1,715 in 1997. Even with the decline in permits, the number of DAS allocated to these permits increased by just over 1%. Allocated DAS can increase for a number of reasons. Vessels are allowed to carry-over up to ten DAS into the following year; the number of permits that exercise this option can change from year to year. History permits that are activated contribute to an increase. Finally, DAS sanctions resulting from enforcement actions can change the allocation from one year to the next. Allocated DAS can also decrease from year to year for similar reasons.

1,062 permits called-in to report DAS in 1998, a decline of 29 vessels from 1997. DAS allocated to vessels that called-in increased by 4.4% in 1998. Figure 29 and Figure 30 illustrate DAS allocated and used for the years 1996 through 1998, by permit categories. The number of DAS used by vessels that called-in was 52,935 DAS, an increase of 7% from 1997 and an increase of 1.6% from 1996. Overall, the total percentage of allocated DAS used by all permitted vessels increased to 34%, while the percentage of allocated DAS used by vessels that called-in increased to 50%. The percentage of allocated DAS used by vessels that called-in increased for all permit categories. The greatest number of unused DAS is in the fleet DAS permit category. Hook gear permits use the smallest percentage of allocated DAS.

Table 27 through Table 29 summarize the use of DAS by permit categories. Vessels that did not call-in DAS are not included in these tables. The percentage of DAS used increased for all permit categories. Individual DAS permits used most of the DAS they were allocated. Nearly 95% of individual DAS permits used over half the DAS allocated, and over 90% used more than 70% of the DAS allocated. By comparison, in 1997 87% of individual DAS permits used over half the DAS allocated. For fleet DAS permits that called-in, 43% of the permits used more than half their allocated DAS. Just over one-quarter of the permits used more than 70% of the allocated DAS. These percentages increased from 1997 as well, when only 38% of the permits used over half the DAS allocated. Hook category permits used the smallest percentage of DAS allocated (18% overall). Only 10% of hook gear permits that called-in used more than half the DAS allocated.

In addition to the permits allocated DAS in 1997 and 1998, there are "history" permits that are not assigned a DAS allocation until they are re-activated. As of April, 1999, there were 72 multispecies history permits. The minimum number of DAS that could be allocated to these vessels, if re-activated, is 6,336 DAS (based on 88 fleet DAS). 15 of these permits were converted to history permits during fishing year 1998 and were allocated, and in some cases used, DAS.

**Monthly DAS Use, All Areas:** Table 31 compares monthly DAS used in fishing years 1997 and 1998 in all areas. Only permits that called-in to use a DAS are included. Fishing year 1997 data includes permits that were removed through the capacity reduction program. The DAS totals in this table differ slightly from those shown in Table 26.

The overall distribution of DAS used over the course of the fishing year, as a percentage of annual DAS used in a given fishing year, shows little variation from 1997 to 1998. For eleven months of the fishing year, the percentage of DAS used is either constant or changed by no more than 1%. The percentage of DAS used in April 1999 was 2% lower than the percentage used in April 1998. Individual permit categories show more variation. Individual DAS permits used their DAS in a similar fashion in 1997 and 1998. For fleet DAS permits, the percentage of DAS declined by 4% in April 1999 and increased by 2% in May 1998. For hook gear vessels, DAS used declined by 2% in October 1998 and April 1999, but increased by 4% in July 1998 compared to the previous year. Combination and large mesh fleet DAS vessels showed considerable year to year variation based on percentage of DAS used.

Overall, the number of DAS used increased by about 3,500 DAS from 1997 to 1998. Most of the increase can be attributed to the fleet DAS, hook gear, and combination permit categories. (The

hook gear permit category does not include vessels that choose to use hook gear in the individual and fleet DAS permit categories). The largest absolute increase came in the fleet DAS category, which used about 3,300 more DAS in 1998 than in 1997, a 10% increase. DAS used by fleet permits increased during every month except October, February, and April. For hook gear vessels, DAS use increased every month except October. The absolute increase in DAS was 365 DAS for hook gear permits, a 24% increase. Combination vessels increased DAS every month of the year except October.

Table 32 summarizes the number of call-in/call-out cycles made by multispecies vessels during fishing years 1997 and 1998. The table refers to each complete cycle as a "trip." It's important to note that a vessel may land fish more than once during one cycle since there isn't a regulatory requirement that a vessel stop its DAS clock when it lands its catch or moors. While the number of DAS increased from 1997 to 1998, the number of complete cycles decreased.

The changes in the percentage distribution over the year of these cycles is similar to the changes in DAS distribution noted earlier. For example, the percentage of annual trips used in April by fleet DAS vessels decreased by 5% from 1997 to 1998, similar to the 4% decrease in DAS. In terms of actual numbers of trips, individual DAS and fleet DAS vessels decreased the number of call-in/call-out cycles from 1997 to 1998, while the other permit categories increased the number of cycles. For the 1998 fishing year, fleet DAS permits decreased the number of trips by 1,684 cycles (from 27,622 in 1997 to 25,938 in 1998). For the period of May 1998 and February through April 1999, fleet DAS decreased the number of call-in/call-out cycles by 2,238 (from 10,507 in fishing year 1997 to 8,269 in fishing year 1998). Individual DAS vessels decreased their total number of trips from 3,418 in 1997 to 3,229 in 1998. Note that while individual DAS vessels also decreased their DAS used from 1997 to 1998, fleet DAS vessels increased their DAS used while decreasing the number of trips. This could either indicate vessels spending more time at sea, vessels "running the clock" because of the Gulf of Maine cod trip limit, or vessels making multiple voyages without stopping the DAS clock.

**Impact Of Option 4 Das/Trip Caps:** Option 4 proposed to reduce fishing mortality on Gulf of Maine cod, in part, by limiting all vessels to 25 DAS or trips during May, February, March, and April of each fishing year. The analysis assumes that the cap applies to these four months in the same fishing year (for example, May 2000 and February/March/April 2001, not February through May, 2001).

In order to estimate the impacts of this option, fishing activity by multispecies vessels was examined in fishing years 1997 and 1998. The impacts of the proposed cap on the actual fishing activity in those years were then evaluated. The number of DAS and trips that would have been "lost" if the cap were in place was calculated. In addition, the number of DAS and trips that could be "gained" if every permit that used DAS fished to the limit can also be calculated. This approach is similar to the "bag limit" approach used to estimate the impact of limits. Several assumptions in using this method should be noted.

- (1) The analysis does not account for any changes in fishing behavior that may result from the DAS/trip cap. The analysis assumes fishermen would fish at the same times of

year as they actually fished, in the same areas, and at the observed levels of effort. It assumes they would be limited by the cap but makes no attempt to model changes in the levels or distribution of effort.

(2) The analysis assumes there will be a connection between actual voyages (defined as a vessel leaving and returning to port, whether fish are landed or not) and a complete call-in/callout cycle, or trip (as defined in the analysis). If this is not the case, some vessels (those that use a small percentage of their annual DAS allocation but make more than 25 trips during the period) could reduce the impact of the cap by letting their DAS clock run while making multiple voyages.

(3) The analysis assumes the months in question are in the same fishing year (two different calendar years) and do not overlap two fishing years.

(4) No allowance is made for permits that did not use groundfish DAS. If the effort represented by these permits were to enter the fishery, the impacts of any proposed cap, would be significantly reduced.

(5) No estimate is made of cod that may be caught during other times of the year as a result of fishermen shifting DAS or trips capped by the limit into another month of the year.

(6) The results of this analysis, based on observed fishing effort in the 1997 fishing year, may not be transferable to existing conditions. Changes in regulations, the markets, and conditions of the resource may result in changes in fishing behavior that reduce the reliability of these estimates.

(7) The analysis does not show the impact of a cap on DAS or number of trips on other species or on total revenues for any of the permit categories.

The Vessel Trip Report (logbook) database includes information on fishing locations. There is no direct link between the DAS database and the logbook database. This prevents a particular trip from being directly tied to a specific DAS cycle, making it difficult to analyze exactly how many DAS were used by a vessel in the Gulf of Maine during a given period. For this reason, DAS used and trips taken were first summarized over all areas for all vessels for a four month period in the fishing year. This gives an accurate baseline count of the number of DAS used and trips taken. A further analysis, described below, attempted to identify the vessels that fished in the Gulf of Maine and calculated the impact of the proposed cap on this smaller group of vessels. Fishing year 1997 was examined since additional inshore closures in the Gulf of Maine were in place in fishing year 1998.

The impact of the proposed 25 DAS/25 trip limit was calculated for all vessels in all areas by calculating the number of DAS or trips that would have been "lost" if the cap were in place (subject to the assumptions listed above). The possible increase in DAS or trips if vessels that fished below the cap increased their activity is also calculated. When calculating the increase in DAS, the annual allocation of DAS to each permit was considered – a vessel that fished less than 25 DAS during the

period, but used all its DAS over the course of the year, was assumed to be unable to increase its DAS to the cap. This ignores the possibility a vessel may shift its fishing effort from one part of the year to another.

Table 33 and Table 34 summarize this information for the 1997 fishing year with a proposed cap of 25 DAS/25 trips, if these limits were applied to all vessels in all management areas. 19% (3,425) of the DAS used during May, February, March and April in fishing year 1997 would have been limited by a 25 DAS cap. Generally, the DAS cap impacts individual DAS vessels while the trip cap impacts other permit categories. A 25 DAS cap would have impacted 73% (109) of the individual DAS vessels that used DAS in 1997 if it was applied to all management areas. By comparison, 19% (161) of fleet DAS vessels, 4% (4) hook gear, and 0% of the combination or large mesh fleet DAS vessels would have been constrained by the limit. The impacts of the proposed trip cap, however, are different: 17% (2,074) of the trips taken in the four month period in fishing year 1997 would have been limited by a 25 trip cap. For individual DAS vessels, a 25 trip cap would have constrained 2% (3) of the vessels. 18% (145) of fleet DAS vessels, 5% (5) hook gear vessels, and none of the combination or large mesh fleet DAS vessels would have been constrained by the trip cap.

In order to estimate the impact of the proposed caps on vessels fishing in the Gulf of Maine, the vessel logbook database was queried to identify all trips from the Gulf of Maine during the four month period. Reported cod landings were obtained for the vessels that made these trips. For the analysis, vessels that reported landings from the Gulf of Maine in a month the cap would be effective were assumed to make all their trips and use all their DAS in the Gulf of Maine during that month. This assumption may introduce errors into the analysis because vessels may have fished in other areas on some trips. The alternative, however, is a trip by trip analysis that cannot be performed because, as mentioned earlier, there is no direct link between the DAS data and the logbook database. This assumption overestimates the number of DAS and trips used in the Gulf of Maine and overestimates the impacts of the proposed cap. A lack of time prevents these results from being compared to the list of vessels that applied for an exemption to the Gulf of Maine cod trip limit.

Table 35 and Table 36 summarize the number of DAS and call-in/call-out cycles used in the Gulf of Maine during the months of May 1997, and February through April 1998. 9,523 DAS were used in this area during this time period, roughly 20% of total annual DAS used. The most DAS and the most trips were used in April of 1998. There were 7,217 call-in/call-out cycles in this area during the period, or about 22% of the total number of cycles for the year.

Using the same approach used for all areas, the impact of a 25 DAS and 25 trip limit on Gulf of Maine effort was calculated. Table 37 and Table 38 summarize these impacts. A 25 DAS limit imposed on observed effort in fishing year 1997 would have reduced the number of DAS used by 1,786, or 18.7% of the total during the four-month period. The impact of the DAS limit varies by permit category. Individual DAS vessels would have lost 778 DAS, or 31% of the DAS used during this period. Fleet DAS permits would have lost 978 DAS, or 14.7%. With respect to the 25 trip cap, 1,528 trips (21% of the total in the period) would have been lost if the limit was in effect in fishing year 1997. Individual DAS vessels would have lost only 18 trips (3%). Fleet DAS vessels would have lost 1,491 trips, or 23.8% of the total trips taken.

The number of DAS constrained was calculated for various DAS limits and plotted in Figure 31. The number of vessels that would be constrained by a given number of DAS was also plotted on the same graph. By choosing a DAS limit on the bottom axis, the impact on DAS used in the Gulf of Maine in fishing year 1997 can be estimated. At the same time, the number of vessels that would be constrained by the limit can be determined by using the right hand axis and the vessel curve. Figure 32 shows the impact of various limits on the number of trips (call-in/call-out cycles) on the number of trips in the Gulf of Maine, based on observed effort in the 1997 fishing year.

**Estimated Impact of Limits on Cod Landings:** The impact on the Gulf of Maine cod catch of the various trip and DAS limits was estimated based on observed activity and landings in fishing year 1997. The vessel trip report database was queried to identify vessels with landings of any species from statistical areas 464, 465, and 510 through 515. Vessels with landings reported in the months of May 1997 and February through April 1998 were then combined with information on monthly DAS usage from the NMFS Office of Enforcement. A database was constructed that combined these two datasets, focusing on cod landings from these statistical areas.

The monthly Gulf of Maine cod landings identified in this fashion differ from the landings reported by the Northeast Region's Office of Statistics. This is because NMFS uses a combined dealer and vessel logbook database, while the analysis in this section relied entirely on vessel logbook data. The differences between the two sets of data are summarized in Table 39. Because of these differences, the cod landings in the following analysis cannot be directly compared to other data in this document. For this reason, in this section the landings information, and the impact of the proposed limits, are reported as percentages of the analyzed landings.

Table 40 and Table 41 summarize the percentage of analyzed Gulf of Maine cod landings by permit category. From these tables, it can be seen that in the four months examined in the 1997 fishing year, fleet category permits landed 66% of the Gulf of Maine cod analyzed. Individual DAS vessels landed 31%, and hook gear permitted vessels landed 3%. Combination and large mesh fleet DAS vessels landed an insignificant amount of the analyzed landings. 51% of the cod was landed by vessels that used 30 DAS or less, 65% by vessels that used 35 DAS or less, and 75% by vessels that used 40 DAS or less during the four-month period. With respect to number of trips (call-in/call-out cycles), 43% was landed by vessels that used 10 trips or less, 52% by vessels that used 15 trips or less, and 74% by vessels that used 35 trips or less.

The impact of various limits on DAS or number of trips was estimated by assuming that for a given vessel, cod landings would decline by the same percentage as trips or DAS constrained. That is, there is an assumed uniform catch rate on all trips in the period. For example, a 10% loss in DAS equated to a 10% loss in cod landings; a 10% decline in number of trips is assumed to result in a 10% decline in cod landings. The results should be considered the maximum decline in landings for the following reasons. First, if a trip or DAS limit is imposed, fishermen are likely to use their effort when they will maximize their profits. This may mean focusing on days with high cod catch rates. Second, they may shift some of their effort to other times of the year and catch Gulf of Maine cod. While vessels that are not presently using all their DAS may be unlikely to do so, those vessels currently using all or most of their DAS are likely to use up the DAS in some month without a limit. Both of these reactions would reduce the impact of any limit on DAS or number of trips.

The results of these estimates are shown in Table 42 for the DAS cap and in Table 43 for the various trip caps. The percentages in these tables, as noted above, refer to the percentage of analyzed landings (during the four-month period) that would be foregone under the proposed limits. The proposed 25 DAS cap would have constrained 20% of the analyzed landings, with 9% contributed by individual DAS permits and 11% by fleet DAS permits. Because each of these permit categories caught different amounts of cod, this means individual permit vessels would have lost about 30% of their cod landings, and fleet DAS vessels would have lost 17% of their cod landings. Under the proposed 25 trip limit, 13% of the landings would have been constrained; 12% (equal to 18% of the cod landings by this sector) would be contributed by fleet DAS permits, while the other permit categories combined contributed 1%.

During the 1997 and 1998 fishing years, approximately 37 percent and 35 percent, respectively, of cod was landed during the four months, May and February-April. Thus, approximately five to seven percent of the total cod landings for the year would be constrained, not considering effort shifts to other parts of the year.

Figure 33 summarizes the "savings" in analyzed cod landings under various DAS limits for three permit categories. By choosing a particular DAS limit, the percentage of analyzed landings constrained from each permit category can be estimated. The total amount is the sum of the percentages for all three permit categories. Figure 34 is a similar illustration of the impact on the analyzed landings of various limits on the number of trips. (The lines on these figures are smoothed lines connecting the datapoints for clarity, and are not the result of a regression analysis of the data).

Table 44 and Table 45 summarize the number of DAS constrained by various DAS or trips limits, based on permit categories. These two tables show that the impact of DAS and trip limits differs between the three permit categories that landed most Gulf of Maine cod. While not an explicit measure of the impacts of the limits on other activities of these vessels, these tables do give a sense of the possible impacts on vessel activities. The proposed 25 DAS limit, for example, constrains 31% of the DAS used by individual DAS vessels during the four month period in the 1997 fishing year, but only 15% of the DAS used by fleet category permits and 9% of the DAS used by hook gear permits. This would indicate the proposed DAS limit would affect overall landings and revenues of individual DAS vessels more than the other permit categories. In a similar fashion, Table 45 summarizes the number of groundfish trips constrained by various trip limits based on observed effort in the 1997 fishing year. The proposed 25 trip limit would only constrain 3% of the trips taken by individual DAS vessels in fishing year 1997, while constraining 6% of the hook gear trips and 24% of the fleet DAS trips. Figure 35 and Figure 36 illustrate the data in these tables.

**Discussion:** The data presented indicates that a restriction on DAS used and trips taken in the Gulf of Maine during the months of May, February, March and April of a fishing year may reduce cod landings during this period. The information presented must be evaluated with a clear understanding of the assumptions listed previously. Shifts in effort to other times of the year or even in-season changes in the distribution of DAS could reduce the estimated impacts of this approach.

It is clear that the proposed limits have different impacts on different permit categories. For an equitable use of this method, different restrictions may need to be adopted for different permit categories. The information in the figures in this analysis can be used as a starting point for discussion. For example, if the goal is to have each permit category reduce its effort on groundfish in the Gulf of Maine by a similar percentage, Figure 35 and Figure 36 can be examined together. A 35 DAS limit would reduce individual DAS effort by about 15% but would have a much smaller impact on fleet DAS and hook gear permits. A 30-trip limit on fleet DAS vessels during the proposed four month period would reduce effort by 17%, or roughly the same impact as a 30 DAS limit on individual vessels. Lower limits would need to be set for hook permits, but because of this category's low analyzed cod catches, the savings would be negligible.

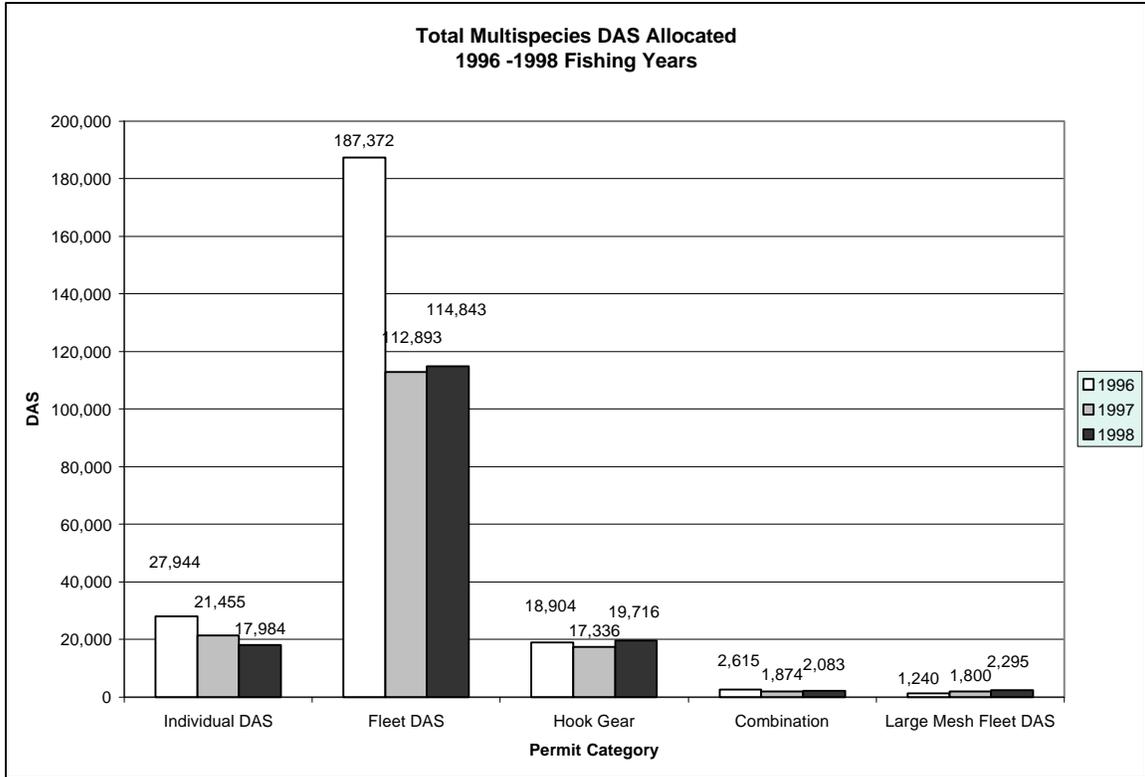
Using these limits to enter the graphs in Figure 33 and Figure 34, the 35 DAS limit on individual DAS vessels would "save" about 4% of the analyzed Gulf of Maine cod landings observed in 1997. This is about 13% of the cod landings by this sector. A 30 trip limit on fleet DAS vessels would "save" 9% of the cod landings by this sector. This is about 15% of the analyzed cod landings by fleet permits. Total estimated "savings" with these two measures is about 13% of the analyzed cod landings. As noted, this estimate should be viewed with caution because it does not account for changes in behavior or the redirecting of effort to other times of the year. In addition, the limit on trips will only be effective if a trip is defined as each time a vessel returns to port. If a trip is defined as a call-in/call-out cycle (as defined in this analysis), vessels that use a small percentage of their DAS will be able to avoid the impact of a limit on trips by running their clock and making multiple trips during each cycle.



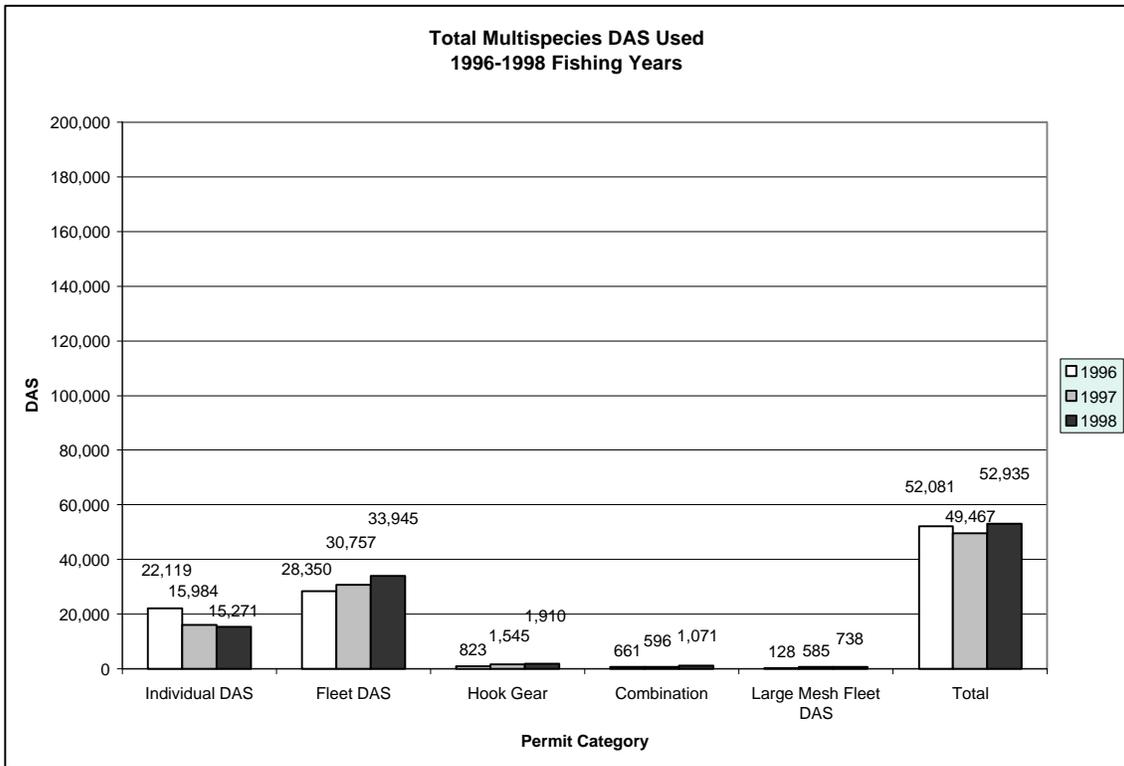
Permit Category	Number of Permits	DAS Allocated	Permits that Called-in	DAS Allocated to Permits that Called-in	DAS Used	% of DAS Used by Permitted Vessels	% of DAS Used by Permitted Vessels that Called-in
<b>1998</b>							
Individual DAS	137	17,984	130	17,079	15,271	85%	89%
Fleet DAS	1,225	114,843	787	75,408	33,945	30%	45%
Hook Gear	212	19,716	109	10,482	1,910	10%	18%
Combination	44	2,083	22	1,573	1,071	51%	68%
Large Mesh Fleet DAS	18	2,295	14	1,805	738	32%	41%
Total	1,636	156,921	1,062	106,347	52,935	34%	50%
<b>1997</b>							
Individual DAS	174	21,455	150	19,028	15,984	75%	84%
Fleet DAS	1,285	112,893	809	71,093	30,757	27%	43%
Hook Gear	198	17,336	106	9,328	1,545	9%	17%
Combination	43	1,874	15	1,136	596	32%	52%
Large Mesh Fleet DAS	15	1,800	11	1,320	585	30%	41%
Total	1,715	155,358	1,091	101,905	49,467	32%	49%
<b>1996</b>							
Individual DAS	177	27,944	155	25,729	22,119	79%	86%
Fleet DAS	1,349	187,372	732	103,138	28,350	15%	27%
Hook Gear	136	18,904	76	10,564	823	4%	8%
Combination	48	2,615	14	1,021	661	25%	65%
Large Mesh Fleet DAS	8	1,240	6	930	128	10%	14%
Total	1,718	238,075	983	141,382	52,081	22%	37%

**Table 26 – Multispecies DAS , 1996 – 1998 fishing years**





**Figure 29 – Multispecies DAS allocated, fishing years 1996 through 1998**



**Figure 30 – Multispecies DAS used, fishing years 1996 through 1998**

Individual DAS (Category A)						
	Fishing Year 1996		Fishing Year 1997		Fishing Year 1998	
% Total DAS Used	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %
0 -10%	1.3%	100.0%	1.3%	100.0%	1.5%	100.0%
11-20%	1.9%	98.7%	4.0%	98.7%	0.0%	98.5%
21-30%	2.6%	96.8%	2.7%	94.7%	0.8%	98.5%
31-40%	2.5%	94.2%	2.7%	92.0%	0.8%	97.7%
41-50%	3.2%	91.7%	2.0%	89.3%	2.3%	96.9%
51-60%	5.7%	88.5%	1.3%	87.3%	2.3%	94.6%
61-70%	6.4%	82.8%	4.0%	86.0%	1.6%	92.3%
71-80%	7.6%	76.4%	2.7%	82.0%	0.0%	90.7%
81-90%	11.5%	68.8%	10.7%	79.3%	14.0%	90.7%
91-100%	22.9%	57.3%	67.3%	68.6%	73.6%	76.7%
> 100%	34.4%	34.4%	1.3%	1.3%	3.1%	3.1%

**Table 27 – Individual DAS vessels. Percent of vessels calling in that used X% of their DAS allocation.**

Fleet DAS (Category B)						
	Fishing Year 1996		Fishing Year 1997		Fishing Year 1998	
% of Total DAS Used	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %
0 -10%	33.4%	100.0%	19.7%	100.0%	15.6%	100.0%
11-20%	16.2%	66.6%	12.3%	80.3%	11.7%	84.3%
21-30%	14.1%	50.4%	10.9%	68.0%	9.5%	72.6%
31-40%	12.7%	36.3%	10.4%	57.1%	11.0%	63.1%
41-50%	6.9%	23.6%	8.9%	46.7%	9.1%	52.1%
51-60%	5.3%	16.7%	7.9%	37.8%	8.5%	43.0%
61-70%	3.0%	11.4%	7.4%	29.9%	7.3%	34.5%
71-80%	2.2%	8.4%	6.2%	22.5%	0.0%	27.2%
81-90%	3.2%	6.2%	7.4%	16.3%	15.6%	27.2%
91-100%	1.3%	3.0%	8.3%	8.9%	11.0%	11.6%
> 100%	1.7%	1.7%	0.6%	0.6%	0.6%	0.6%

**Table 28 – Fleet DAS vessels. Percent of vessels calling-in that used X% of their total DAS allocation.**

Hook Gear (Category D)						
	Fishing Year 1996		Fishing Year 1997		Fishing Year 1998	
% of Total DAS Used	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %
0 -10%			56.6%	100.0%	47.2%	100.0%
11-20%			17.0%	43.4%	17.9%	52.7%
21-30%			6.6%	26.4%	11.3%	34.8%
31-40%			5.7%	19.8%	8.5%	23.5%
41-50%			1.9%	14.1%	4.7%	15.0%
51-60%			7.5%	12.2%	6.6%	10.3%
61-70%			2.8%	4.7%	2.8%	3.7%
71-80%			1.9%	1.9%	0.0%	0.9%
81-90%			0.0%	0.0%	0.9%	0.9%
91-100%			0.0%	0.0%	0.0%	0.0%
> 100%			0.0%	0.0%	0.0%	0.0%

**Table 29 – Hook gear vessels. Percent of vessels calling-in that used X% of their total DAS allocation.**

Combination Vessels (Category E)						
	Fishing Year 1996		Fishing Year 1997		Fishing Year 1998	
% of Total DAS Used	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %	% of Vessels Calling In that Used X% of Total DAS	Cumulative %
0 -10%	21.5%	100.0%	13.3%	100.0%	4.5%	100.0%
11-20%	7.1%	78.5%	13.3%	86.7%	9.1%	95.4%
21-30%	0.0%	71.4%	13.3%	73.4%	0.00%	86.3%
31-40%	0.0%	71.4%	0.0%	60.1%	13.6%	86.3%
41-50%	7.1%	71.4%	0.0%	60.1%	9.1%	72.7%
51-60%	0.0%	64.3%	13.3%	60.1%	0.00%	63.6%
61-70%	14.3%	64.3%	6.7%	46.8%	4.5%	63.6%
71-80%	7.1%	50.0%	6.7%	40.1%	0.0%	59.1%
81-90%	14.3%	42.9%	6.7%	33.4%	31.8%	59.1%
91-100%	14.3%	28.6%	26.7%	26.7%	27.3%	27.3%
> 100%	14.3%	14.3%	0.0%	0.0%	0.00%	0.0%

**Table 30 – Combination DAS vessels. Percent of vessels calling-in that used X% of their total DAS allocation.**



Month	Data	Individual DAS		Fleet DAS		Hook Gear		Combination		Large Mesh Fleet DAS		Grand Total	
		1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
May	% of DAS Used	9%	8%	10%	12%	5%	7%	8%	6%	8%	9%	10%	11%
	DAS Used	1,434	1,154	3,180	4,178	80	125	46	65	48	64	4,788	5,586
June	% of DAS Used	9%	8%	13%	12%	7%	7%	5%	5%	14%	11%	11%	10%
	DAS Used	1,471	1,192	3,913	4,070	109	138	32	56	85	81	5,611	5,537
July	% of DAS Used	8%	8%	9%	10%	4%	8%	5%	5%	15%	11%	9%	9%
	DAS Used	1,343	1,198	2,768	3,348	69	146	30	56	89	80	4,299	4,827
August	% of DAS Used	9%	8%	8%	7%	10%	8%	11%	8%	11%	10%	8%	8%
	DAS Used	1,423	1,225	2,413	2,469	149	153	65	79	67	77	4,116	4,003
September	% of DAS Used	10%	11%	7%	8%	6%	7%	8%	9%	13%	13%	8%	9%
	DAS Used	1,604	1,669	2,137	2,612	87	128	47	100	75	95	3,950	4,605
October	% of DAS Used	9%	9%	7%	6%	5%	3%	19%	9%	11%	12%	8%	7%
	DAS Used	1,445	1,449	2,124	2,007	73	61	113	100	66	85	3,821	3,703
November	% of DAS Used	8%	7%	6%	7%	4%	6%	15%	8%	7%	7%	7%	7%
	DAS Used	1,279	1,099	1,828	2,349	69	112	87	88	42	51	3,306	3,699
December	% of DAS Used	7%	9%	7%	8%	12%	11%	9%	10%	5%	7%	7%	8%
	DAS Used	1,177	1,316	2,116	2,683	179	205	56	111	29	55	3,556	4,369
January	% of DAS Used	7%	8%	5%	7%	11%	11%	8%	8%	6%	8%	6%	7%
	DAS Used	1,090	1,224	1,474	2,384	174	208	49	83	37	59	2,825	3,957
February	% of DAS Used	6%	6%	6%	5%	10%	10%	5%	7%	1%	4%	6%	6%
	DAS Used	1,025	950	1,822	1,775	157	182	27	77	7	33	3,038	3,018
March	% of DAS Used	9%	9%	8%	7%	11%	12%	3%	12%	2%	2%	8%	8%
	DAS Used	1,468	1,443	2,444	2,460	176	234	18	124	10	14	4,115	4,275
April	% of DAS Used	8%	9%	15%	11%	14%	12%	4%	11%	5%	6%	12%	10%
	DAS Used	1,214	1,362	4,533	3,713	222	223	24	117	32	44	6,025	5,459
Total	% of DAS Used	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	DAS Used	15,974	15,280	30,752	34,047	1,545	1,917	595	1,056	585	738	49,451	53,037

**Table 31 – Monthly DAS used, by permit category, 1997 and 1998 fishing years**

Month	Data	Individual DAS		Fleet DAS		Hook Gear		Combination		Large Mesh Fleet DAS		Grand Total	
		1997	1998	1997	1998	1997	1998	1997	1998	1997	1998	1997	1998
May	% of Trips Trips	8% 289	8% 248	12% 3,341	13% 3,323	6% 117	7% 171	4% 4	6% 13	12% 51	13% 88	11% 3,803	12% 3,842
June	% of Trips Trips	8% 281	8% 258	12% 3,443	12% 3,115	7% 134	8% 190	5% 5	4% 9	14% 62	13% 86	12% 3,925	11% 3,658
July	% of Trips Trips	7% 236	7% 235	9% 2,435	10% 2,550	4% 67	7% 156	5% 4	6% 12	17% 76	8% 57	8% 2,819	9% 3,010
August	% of Trips Trips	7% 251	7% 228	7% 2,007	7% 1,781	10% 193	8% 176	8% 8	7% 15	9% 40	9% 61	7% 2,500	7% 2,261
September	% of Trips Trips	8% 277	9% 292	6% 1,667	8% 2,176	7% 135	9% 197	7% 7	8% 16	10% 45	12% 84	6% 2,131	9% 2,766
October	% of Trips Trips	9% 320	9% 284	7% 1,839	6% 1,651	7% 127	5% 120	22% 21	10% 20	9% 38	10% 67	7% 2,346	7% 2,142
November	% of Trips Trips	11% 375	8% 273	6% 1,785	9% 2,249	6% 120	9% 203	17% 16	12% 24	6% 28	9% 62	7% 2,325	9% 2,810
December	% of Trips Trips	9% 302	9% 297	8% 2,184	9% 2,387	11% 213	11% 257	9% 9	11% 23	5% 24	8% 56	8% 2,732	9% 3,020
January	% of Trips Trips	9% 309	9% 296	6% 1,753	7% 1,761	11% 203	8% 186	10% 10	6% 13	4% 19	6% 44	7% 2,294	7% 2,300
February	% of Trips Trips	7% 241	8% 254	6% 1,776	5% 1,411	9% 179	9% 211	5% 4	7% 16	2% 7	4% 27	7% 2,206	6% 1,919
March	% of Trips Trips	8% 285	10% 330	7% 1,964	6% 1,661	9% 169	9% 207	2% 2	11% 22	2% 8	2% 13	7% 2,429	7% 2,233
April	% of Trips Trips	7% 252	7% 235	12% 3,426	7% 1,874	13% 237	9% 212	5% 5	12% 26	9% 40	5% 37	12% 3,960	7% 2,384
Total	% of Trips Trips	100% 3,418	100% 3,229	100% 27,622	100% 25,938	100% 1,895	100% 2,286	100% 97	100% 208	100% 438	100% 682	100% 33,470	100% 32,343

**Table 32 – Number of multispecies call-in/call-out cycles, by permit category, fishing years 1997 and 1998**

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
0	Number of Permits	1	85	26	6	3	121
	DAS Used	0	0	0	0	0	0
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	25	1,980	650	91	54	2,800
>0 - 5	Number of Permits	4	136	41	2	1	184
	DAS Used	14	292	76	6	4	391
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	86	3,068	949	40	21	4,164
>5 - 10	Number of Permits	8	122	17	1	2	150
	DAS Used	63	926	121	5	13	1,129
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	127	2,020	304	20	37	2,507
>10 - 15	Number of Permits	5	111	6	3	3	128
	DAS Used	62	1,377	69	42	38	1,587
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	50	1,279	81	23	37	1,470
>15 - 20	Number of Permits	14	104	8	1	1	128
	DAS Used	248	1,799	146	16	16	2,226
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	90	742	54	0	9	895
>20 - 25	Number of Permits	9	90	4	1	1	105
	DAS Used	194	2,007	88	20	24	2,333
	Impact of Cap	0	0	0	0	0	0
	Possible DAS Increase	23	238	12	5	0	278
>25 - 30	Number of Permits	17	62		1		80
	DAS Used	471	1,706		26		2,204
	Impact of Cap	46	156		1		204
	Possible DAS Increase	0	0		0		0
>30 - 35	Number of Permits	16	38	3			57
	DAS Used	514	1,242	96			1,853
	Impact of Cap	114	292	21			428
	Possible DAS Increase	0	0	0			0

**Table 33 – DAS used and impact of 25 DAS limit on observed fishing effort, May 1997, February through April 1998, all areas**

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
>35 - 40	Number of Permits	15	28	1			44
	DAS Used	558	1,031	39			1,628
	Impact of Cap	183	331	14			528
	Possible DAS Increase	0	0	0			0
>40 - 45	Number of Permits	22	12				34
	DAS Used	934	496				1,430
	Impact of Cap	384	196				580
	Possible DAS Increase	0	0				0
>45 - 50	Number of Permits	16	9				25
	DAS Used	766	426				1,192
	Impact of Cap	366	201				567
	Possible DAS Increase	0	0				0
>50 - 55	Number of Permits	13	8				21
	DAS Used	680	417				1,097
	Impact of Cap	355	217				572
	Possible DAS Increase	0	0				0
>55 - 60	Number of Permits	5	1				6
	DAS Used	283	60				343
	Impact of Cap	158	35				193
	Possible DAS Increase	0	0				0
>60 - 65	Number of Permits	2	1				3
	DAS Used	127	62				189
	Impact of Cap	77	37				114
	Possible DAS Increase	0	0				0
>65 - 70	Number of Permits		2				2
	DAS Used		137				137
	Impact of Cap		87				87
	Possible DAS Increase		0				0
>70 - 75	Number of Permits	1					1
	DAS Used	70					70
	Impact of Cap	45					45
	Possible DAS Increase	0					0

Table 33 (cont.) – DAS used and impact of 25 DAS limit on observed fishing effort, May 1997, February through April 1998, all areas

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
>75 - 80	Number of Permits	1					1
	DAS Used	75					75
	Impact of Cap	50					50
	Possible DAS Increase	0					0
>80 - 85	Number of Permits	1					1
	DAS Used	81					81
	Impact of Cap	56					56
	Possible DAS Increase	0					0
Total Number of Permits		150	809	106	15	11	1,091
Total DAS Used		5,141	11,979	635	115	96	17,966
Total Impact of Cap		1,835	1,553	35	1	0	3,425
Total Possible DAS Increase		402	9,326	2,050	178	158	12,114

**Table 33 (cont.) – DAS used and impact of 25 DAS limit on observed fishing effort, May 1997, February through April 1998, all areas**

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
0	Number of Permits	1	84	26	6	3	120
	Number of Trips	0	0	0	0	0	0
	Impact of Cap	0	0	0	0	0	0
	Possible Trips Increase	25	2,100	650	150	75	3,000
>0 - 5	Number of Permits	50	264	40	9	1	364
	Number of Trips	154	676	102	16	4	951
	Impact of Cap	0	0	0	0	0	0
	Possible Trips Increase	1,096	5,924	898	209	21	8,149
>5 - 10	Number of Permits	77	127	17		2	223
	Number of Trips	561	959	131		17	1,668
	Impact of Cap	0	0	0		0	0
	Possible Trips Increase	1,364	2,216	294		33	3,907
>10 - 15	Number of Permits	12	81	6		2	101
	Number of Trips	137	1,027	79		24	1,268
	Impact of Cap	0	0	0		0	0
	Possible Trips Increase	163	998	71		26	1,257
>15 - 20	Number of Permits	6	51	7		2	66
	Number of Trips	100	912	126		37	1,175
	Impact of Cap	0	0	0		0	0
	Possible Trips Increase	50	363	49		13	475
>20 - 25	Number of Permits	1	57	5		1	64
	Number of Trips	21	1,281	111		24	1,437
	Impact of Cap	0	0	0		0	0
	Possible Trips Increase	4	144	14		1	163
>25 - 30	Number of Permits	2	43	3			48
	Number of Trips	54	1,199	86			1,338
	Impact of Cap	4	124	11			138
	Possible Trips Increase	0	0	0			0

**Table 34 – Trips (call-in/call-out cycles) taken, and impact of a 25 trip cap on observed fishing effort, May 1997, February through April, 1998, all areas**

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
>30 - 35	Number of Permits		24	2			26
	Number of Trips		780	67			847
	Impact of Cap		180	17			197
	Possible Trips Increase		0	0			0
>35 - 40	Number of Permits	1	23				24
	Number of Trips	40	869				909
	Impact of Cap	15	294				309
	Possible Trips Increase	0	0				0
>40 - 45	Number of Permits		19				19
	Number of Trips		819				819
	Impact of Cap		344				344
	Possible Trips Increase		0				0
>45 - 50	Number of Permits		14				14
	Number of Trips		680				680
	Impact of Cap		330				330
	Possible Trips Increase		0				0
>50 - 55	Number of Permits		8				8
	Number of Trips		423				423
	Impact of Cap		223				223
	Possible Trips Increase		0				0
>55 - 60	Number of Permits		7				7
	Number of Trips		408				408
	Impact of Cap		233				233
	Possible Trips Increase		0				0
>60 - 65	Number of Permits		3				3
	Number of Trips		190				190
	Impact of Cap		115				115
	Possible Trips Increase		0				0

Table 34(cont.) – Trips (call-in/call-out cycles) taken, and impact of a 25 trip cap on observed fishing effort, May 1997, February through April, 1998, all areas

DAS Used	Data	Individual DAS	Fleet DAS	Hook Gear	Combination	Large Mesh Fleet DAS	Total
>65 - 70	Number of Permits		2				2
	Number of Trips		136				136
	Impact of Cap		86				86
	Possible Trips Increase		0				0
>70 - 75	Number of Permits		1				1
	Number of Trips		72				72
	Impact of Cap		47				47
	Possible Trips Increase		0				0
>75 - 80	Number of Permits		1				1
	Number of Trips		77				77
	Impact of Cap		52				52
	Possible Trips Increase		0				0
>80 - 85	Number of Permits						
	Number of Trips						
	Impact of Cap						
	Possible Trips Increase						
Total Number of Permits		150	809	106	15	11	1,091
Total Number of Trips		1,066	10,507	702	16	106	12,398
Total Impact of Cap		18	2,028	28	0	0	2,074
Total Possible Trips Increase		2,702	11,745	1,976	359	169	16,951

**Table 34(cont.) – Trips (call-in/call-out cycles) taken, and impact of a 25 trip cap on observed fishing effort, May 1997, February through April, 1998, all areas**

<b>Month</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Total</b>
May-97	558	1,767	27	20	9	2,380
Feb-98	524	925	74			1,524
Mar-98	762	1,248	95		6	2,111
Apr-98	659	2,712	121		15	3,508
<b>Total</b>	<b>2,503</b>	<b>6,652</b>	<b>318</b>	<b>20</b>	<b>29</b>	<b>9,523</b>

**Table 35 – DAS used in the Gulf of Maine, May 1997, February through April 1998**

<b>Month</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Total</b>
May-97	140	2,125	36	3	12	2,316
Feb-98	153	926	84			1,162
Mar-98	167	1,026	82		5	1,280
Apr-98	149	2,186	102		21	2,458
<b>Total</b>	<b>608</b>	<b>6,263</b>	<b>304</b>	<b>3</b>	<b>38</b>	<b>7,217</b>

**Table 36 – Trips (call-in/call-out cycles) used in the Gulf of Maine, May 1997, February through April 1998**



<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
0	Permits		42		3		45
	Four Month DAS Total						
	DAS "Lost" by 25 DAS Limit		0		0		0
	Possible Increase in DAS		1,001		28		1,029
>0 – 5	Permits	3	73	15		1	92
	Four Month DAS Total	11	157	25		4	197
	DAS "Lost" by 25 DAS Limit	0	0	0		0	0
	Possible Increase in DAS	24	1,638	350		21	2,034
>5 – 10	Permits	5	68	7			80
	Four Month DAS Total	40	508	56			604
	DAS "Lost" by 25 DAS Limit	0	0	0			0
	Possible Increase in DAS	47	1,122	119			1,288
>10 – 15	Permits	3	52	3		2	60
	Four Month DAS Total	40	645	33		26	744
	DAS "Lost" by 25 DAS Limit	0	0	0		0	0
	Possible Increase in DAS	23	572	42		24	661
>15 – 20	Permits	12	47	3			62
	Four Month DAS Total	209	810	56			1,076
	DAS "Lost" by 25 DAS Limit	0	0	0			0
	Possible Increase in DAS	67	334	19			420
>20 – 25	Permits	9	46	2	1		58
	Four Month DAS Total	199	1,028	43	20		1,290
	DAS "Lost" by 25 DAS Limit	0	0	0	0		0
	Possible Increase in DAS	22	117	7	5		151

**Table 37 – Gulf of Maine DAS used, and impact of 25 DAS limit, May 1997, February through April 1998**

<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
>25 – 30	Permits	9	39				48
	Four Month DAS Total	252	1,069				1,321
	DAS "Lost" by 25 DAS Limit	27	94				121
	Possible Increase in DAS	0	0				0
>30 - 35	Permits	8	23	2			33
	Four Month DAS Total	260	755	66			1,081
	DAS "Lost" by 25 DAS Limit	60	180	16			256
	Possible Increase in DAS	0	0	0			0
>35 – 40	Permits	8	17	1			26
	Four Month DAS Total	297	628	39			963
	DAS "Lost" by 25 DAS Limit	97	203	14			313
	Possible Increase in DAS	0	0	0			0
>40 – 45	Permits	7	9				16
	Four Month DAS Total	293	374				666
	DAS "Lost" by 25 DAS Limit	118	149				266
	Possible Increase in DAS	0	0				0
>45 – 50	Permits	7	7				14
	Four Month DAS Total	328	330				658
	DAS "Lost" by 25 DAS Limit	153	155				308
	Possible Increase in DAS	0	0				0
>50 – 55	Permits	5	3				8
	Four Month DAS Total	262	157				419
	DAS "Lost" by 25 DAS Limit	137	82				219
	Possible Increase in DAS	0	0				0
>55 – 60	Permits	2	1				3
	Four Month DAS Total	115	60				175
	DAS "Lost" by 25 DAS Limit	65	35				100
	Possible Increase in DAS	0	0				0

**Table 37(cont.) – Gulf of Maine DAS used, and impact of 25 DAS limit, May 1997, February through April 1998**

<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
>60 – 65	Permits	2	1				3
	Four Month DAS Total	127	62				189
	DAS "Lost" by 25 DAS Limit	77	37				114
	Possible Increase in DAS	0	0				0
>65 – 70	Permits		1				1
	Four Month DAS Total		70				70
	DAS "Lost" by 25 DAS Limit		45				45
	Possible Increase in DAS		0				0
>70 – 75	Permits	1					1
	Four Month DAS Total	70					70
	DAS "Lost" by 25 DAS Limit	45					45
	Possible Increase in DAS	0					0
Total Permits		81	429	33	4	3	550
Total Four Month DAS Total		2,503	6,652	318	20	29	9,523
Total DAS "Lost" by 25 DAS Limit		778	978	30	0	0	1,786
Total Possible Increase in DAS		184	4,785	537	33	46	5,583

**Table 37(cont.) – Gulf of Maine DAS used, and impact of 25 DAS limit, May 1997, February through April 1998**

<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
0	Permits		42		3		45
	Trips (4 month period)		0		0		0
	Trips "Lost" by Limit		0		0		0
	Possible Increase in Trips		1,050		75		1,125
>0 – 5	Permits	3	73	15		1	92
	Trips (4 month period)	2	186	45		4	238
	Trips "Lost" by Limit	0	0	0		0	0
	Possible Increase in Trips	73	1,639	330		21	2,062
>5 – 10	Permits	5	68	7			80
	Trips (4 month period)	23	635	46			704
	Trips "Lost" by Limit	0	0	0			0
	Possible Increase in Trips	102	1,065	129			1,296
>10 – 15	Permits	3	52	3		2	60
	Trips (4 month period)	12	682	31		34	759
	Trips "Lost" by Limit	0	12	0		0	12
	Possible Increase in Trips	63	630	44		16	753
>15 – 20	Permits	12	47	3			62
	Trips (4 month period)	50	848	79			977
	Trips "Lost" by Limit	0	107	7			114
	Possible Increase in Trips	250	434	3			687
>20 – 25	Permits	9	46	2	1		58
	Trips (4 month period)	30	1,017	29	3		1,079
	Trips "Lost" by Limit	0	240	0	0		240
	Possible Increase in Trips	195	373	21	22		611

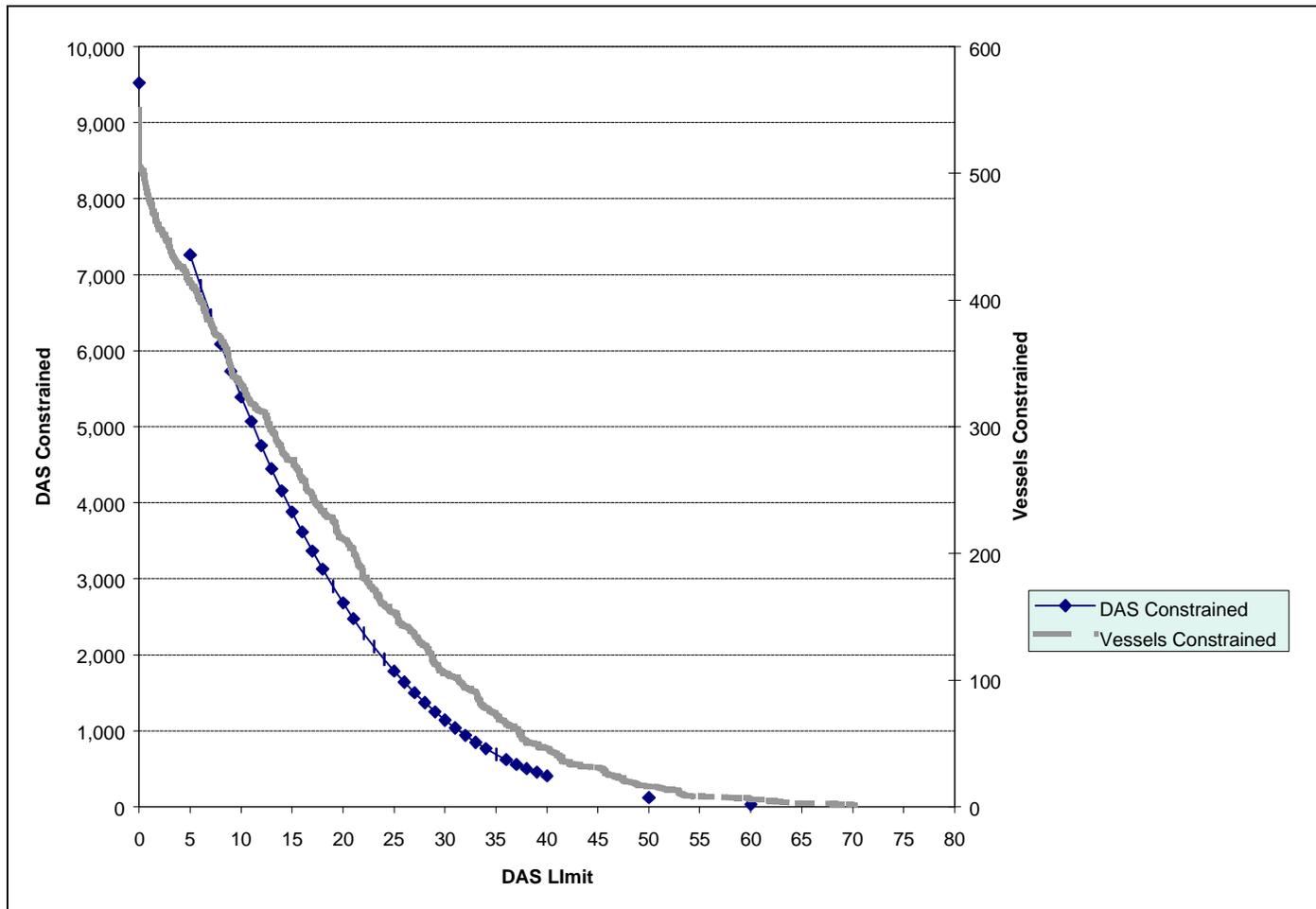
**Table 38 – Gulf of Maine call-in/call out cycles (trips), and impact of 25 trip limit, May 1997, February through April 1998**

<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
>25 – 30	Permits	9	39				48
	Trips (4 month period)	57	1,317				1,374
	Trips "Lost" by Limit	0	548				548
	Possible Increase in Trips	168	206				374
>30 – 35	Permits	8	23	2			33
	Trips (4 month period)	94	661	45			800
	Trips "Lost" by Limit	4	258	7			269
	Possible Increase in Trips	109	172	12			293
>35 - 40	Permits	8	17	1			26
	Trips (4 month period)	69	391	29			490
	Trips "Lost" by Limit	0	159	4			163
	Possible Increase in Trips	131	193	0			324
>40 – 45	Permits	7	9				16
	Trips (4 month period)	67	255				321
	Trips "Lost" by Limit	0	88				88
	Possible Increase in Trips	108	58				167
>45 – 50	Permits	7	7				14
	Trips (4 month period)	115	168				283
	Trips "Lost" by Limit	15	42				57
	Possible Increase in Trips	74	49				123
>50 – 55	Permits	5	3				8
	Trips (4 month period)	45	33				78
	Trips "Lost" by Limit	0	3				3
	Possible Increase in Trips	80	45				125

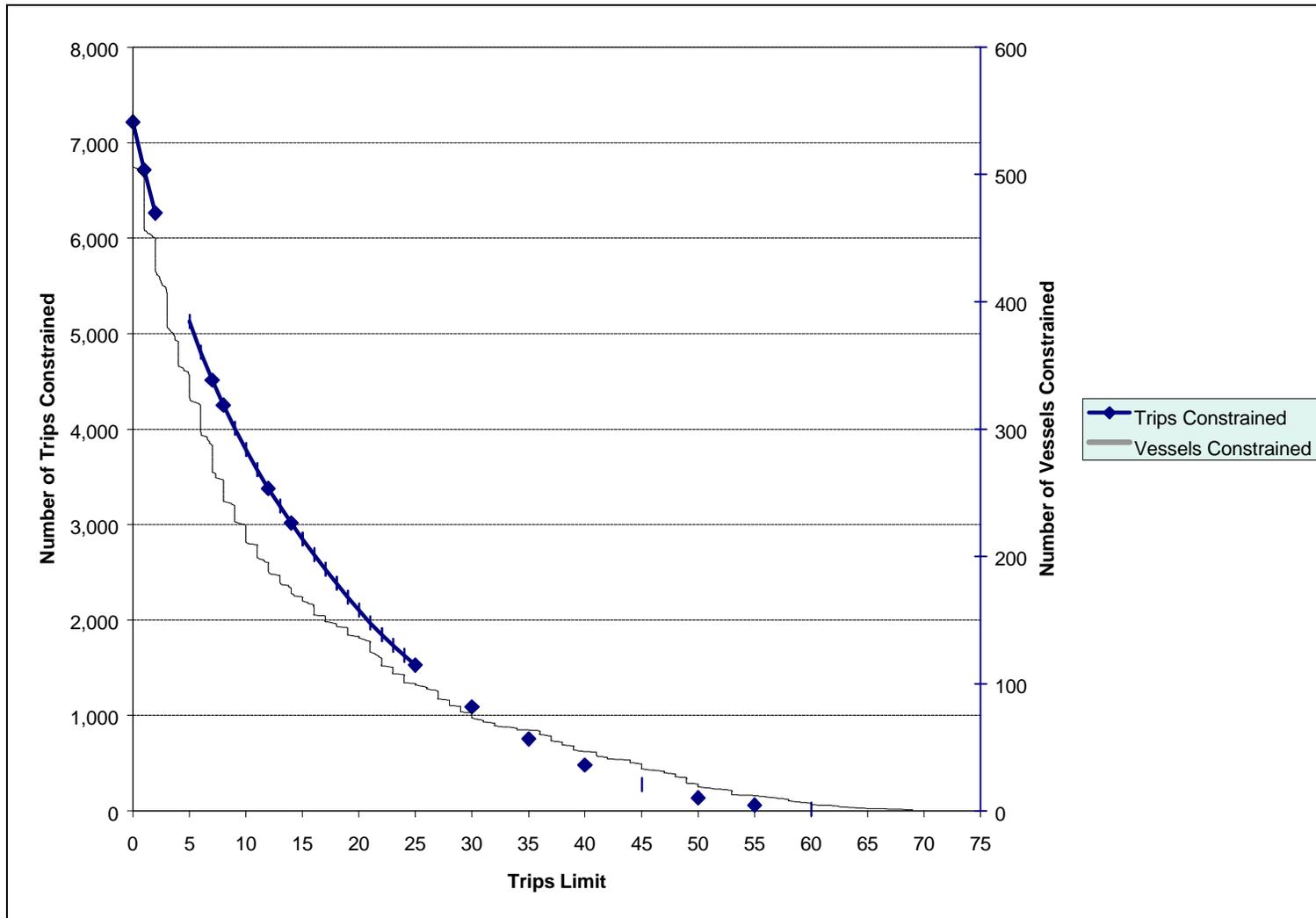
**Table 38(cont.) – Gulf of Maine call-in/call out cycles (trips), and impact of 25 trip limit, May 1997, February through April 1998**

<b>DAS Group</b>	<b>Data</b>	<b>Individual</b>	<b>Fleet DAS</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet DAS</b>	<b>Grand Total</b>
>55 – 60	Permits	2	1				3
	Trips (4 month period)	19	7				25
	Trips "Lost" by Limit	0	0				0
	Possible Increase in Trips	31	18				50
>60 – 65	Permits	2	1				3
	Trips (4 month period)	19	59				78
	Trips "Lost" by Limit	0	34				34
	Possible Increase in Trips	31	0				31
>65 - 70	Permits		1				1
	Trips (4 month period)		5				5
	Trips "Lost" by Limit		0				0
	Possible Increase in Trips		20				20
>70 - 75	Permits	1					1
	Trips (4 month period)	4					4
	Trips "Lost" by Limit	0					0
	Possible Increase in Trips	21					21
<b>Total Permits</b>		<b>81</b>	<b>429</b>	<b>33</b>	<b>4</b>	<b>3</b>	<b>550</b>
<b>Total Trips (4 month period)</b>		<b>608</b>	<b>6,263</b>	<b>304</b>	<b>3</b>	<b>38</b>	<b>7,217</b>
<b>Total Trips "Lost" by Limit</b>		<b>18</b>	<b>1,491</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>1,528</b>
<b>Total Possible Increase in Trips</b>		<b>1,435</b>	<b>5,953</b>	<b>539</b>	<b>97</b>	<b>37</b>	<b>8,061</b>

Table 38(cont.) – Gulf of Maine call-in/call out cycles (trips), and impact of 25 trip limit, May 1997, February through April 1998



**Figure 31 – Impact of various DAS limits on DAS used,, May 1997, February through April 1998**



**Figure 32 – Impact of various limits on the number of groundfish trips based on observed fishing effort, May 1997, February through April 1998**

<b>Month</b>	<b>NMFS Statistics Office</b>	<b>DAS/Trip Limit Analysis</b>	<b>Difference</b>
May-97	1,303,155	1,139,196	163,959
Feb-98	762,000	579,429	182,571
Mar-98	963,000	764,666	198,334
Apr-98	1,236,000	1,040,474	195,526
Total	4,264,155	3,523,765	740,390

**Table 39 – Comparison of Gulf of Maine cod landings (pounds) as reported by NMFS Northeast Region and as used in DAS/trip limit analysis in this section**

DAS Used	Individual	Fleet	Hook Gear	Combination	Large Mesh Fleet DAS	Total
0	0%	0%	0%	0%	0%	0%
>0 – 5	0%	1%	0%	0%	0%	1%
>5 – 10	1%	3%	0%	0%	0%	4%
>10 – 15	1%	5%	0%	0%	0%	6%
>15 – 20	2%	8%	1%	0%	0%	10%
>20 – 25	2%	8%	0%	0%	0%	11%
>25 – 30	5%	13%	0%	0%	0%	19%
>30 – 35	3%	11%	0%	0%	0%	14%
>35 – 40	4%	5%	1%	0%	0%	10%
>40 – 45	3%	4%	0%	0%	0%	7%
>45 – 50	3%	3%	0%	0%	0%	6%
>50 – 55	4%	2%	0%	0%	0%	6%
>55 – 60	1%	1%	0%	0%	0%	2%
>60 – 65	1%	2%	0%	0%	0%	3%
>65 – 70	0%	1%	0%	0%	0%	1%
>70 - 75	0%	0%	0%	0%	0%	0%
Total	31%	66%	3%	0%	0%	100%

**Table 40 – Percentage of analyzed cod landings, May 1997, February through April 1998, by permit category and DAS used**

Trips Taken	Individual	Fleet	Hook Gear	Combination	Large Mesh Fleet DAS	Total
0	0%	0%	0%	0%	0%	0%
>0 – 5	12%	10%	0%	0%	0%	23%
>5 – 10	11%	9%	0%	0%	0%	20%
>10 – 15	5%	5%	0%	0%	0%	9%
>15 – 20	1%	4%	0%	0%	0%	5%
>20 – 25	0%	7%	0%	0%	0%	7%
>25 – 30	1%	6%	1%	0%	0%	8%
>30 – 35	0%	2%	0%	0%	0%	2%
>35 – 40	1%	5%	0%	0%	0%	6%
>40 – 45	0%	5%	0%	0%	0%	5%
>45 – 50	0%	5%	0%	0%	0%	5%
>50 – 55	0%	3%	0%	0%	0%	3%
>55 – 60	0%	5%	0%	0%	0%	5%
>60 – 65	0%	1%	0%	0%	0%	1%
>65 - 70	0%	1%	0%	0%	0%	1%
Total	31%	66%	3%	0%	0%	100%

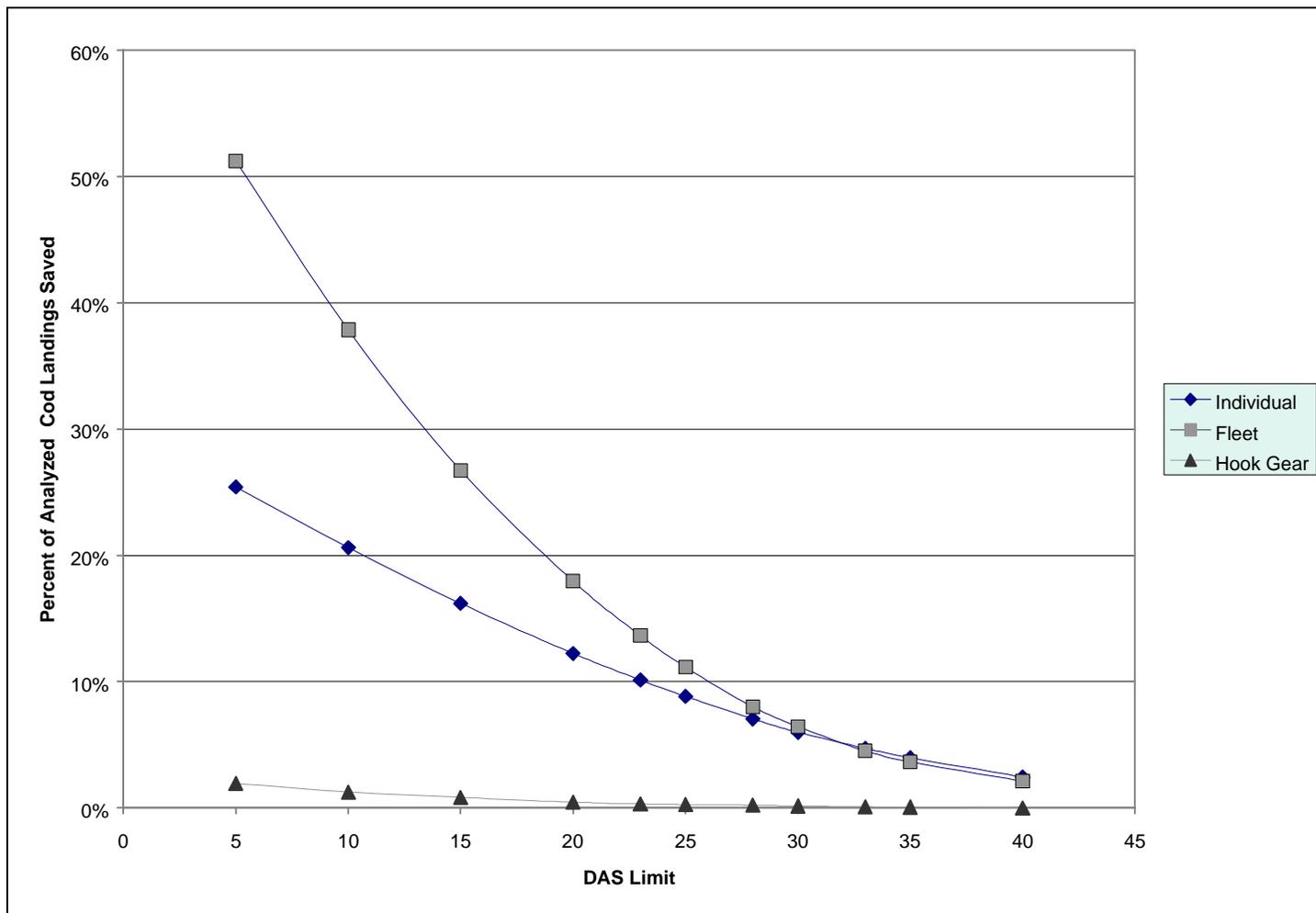
**Table 41 – Percentage of analyzed cod landings, May 1997, February through April 1998, by permit category and number of trips (call-in/call-out cycles) taken**

<b>DAS Limit</b>	<b>Individual</b>	<b>Fleet</b>	<b>Hook Gear</b>	<b>Combina- tion</b>	<b>Large Mesh Fleet</b>	<b>Total</b>
40	2%	2%	0%	0%	0%	5%
35	4%	4%	0%	0%	0%	8%
33	5%	5%	0%	0%	0%	9%
30	6%	6%	0%	0%	0%	13%
28	7%	8%	0%	0%	0%	15%
25	9%	11%	0%	0%	0%	20%
23	10%	14%	0%	0%	0%	24%
20	12%	18%	0%	0%	0%	31%
15	16%	27%	1%	0%	0%	44%
10	21%	38%	1%	0%	0%	60%
5	25%	51%	2%	0%	0%	79%

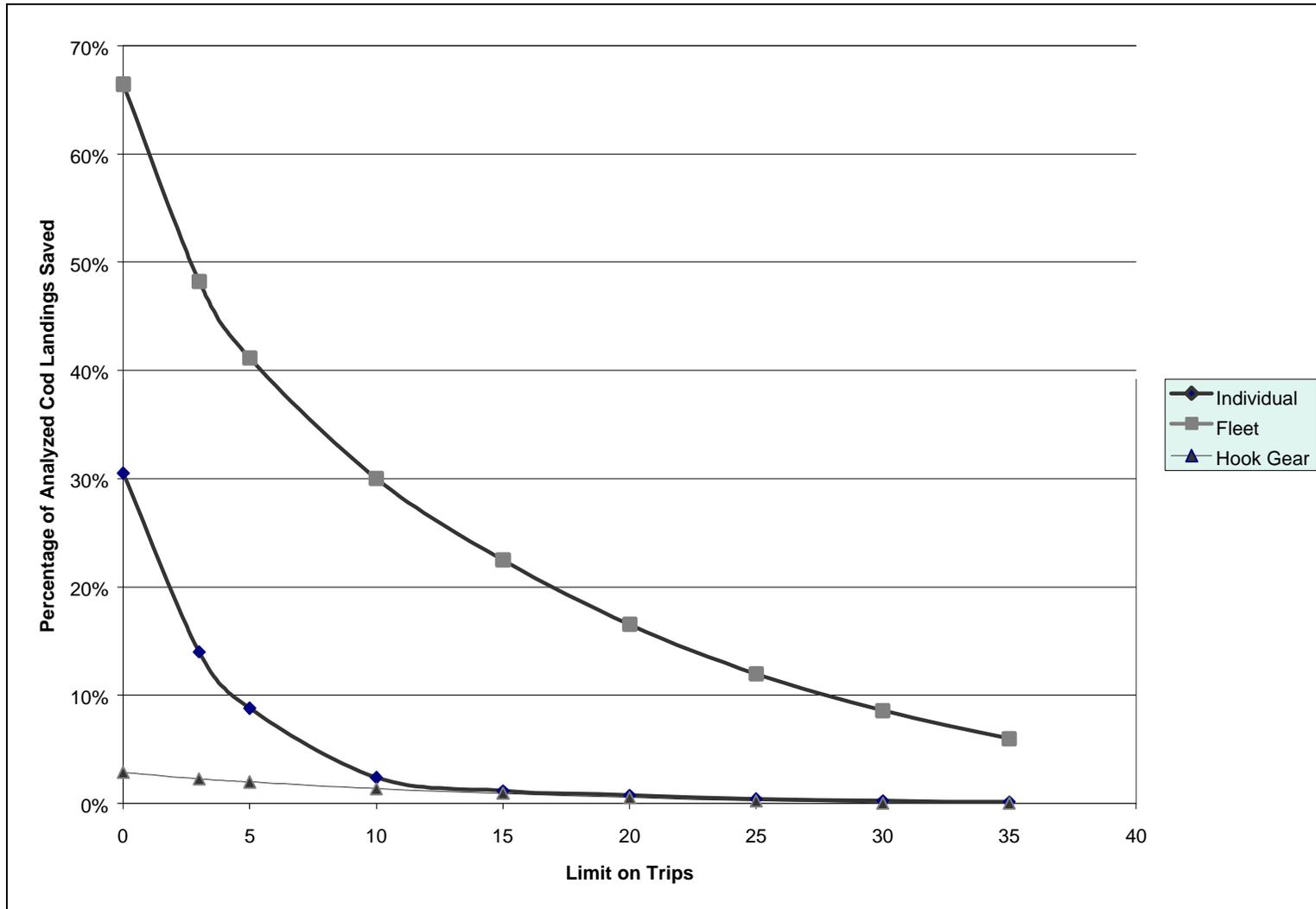
**Table 42 – Percentage of analyzed cod landings "saved" by various DAS limits (based on observed landings, May 1997, February through April 1998)**

<b>Limit on Trips</b>	<b>Individual</b>	<b>Fleet</b>	<b>Hook Gear</b>	<b>Combina- tion</b>	<b>Large Mesh Fleet DAS</b>	<b>Total</b>
35	0%	6%	0%	0%	0%	6%
30	0%	9%	0%	0%	0%	9%
25	0%	12%	0%	0%	0%	13%
20	1%	17%	1%	0%	0%	18%
15	1%	22%	1%	0%	0%	25%
10	2%	30%	1%	0%	0%	34%
5	9%	41%	2%	0%	0%	52%
3	14%	48%	2%	0%	0%	65%
0	31%	66%	3%	0%	0%	100%

**Table 43 – Percentage of analyzed cod landings saved by various limits on number of trips (based on observed landings May 1997, February through April 1998)**



**Figure 33 – Percentage of analyzed cod landings constrained by various DAS limits, based on observed landings, May 1997, February through April 1998**



**Figure 34 – Percentage of analyzed cod landings constrained by various limits on number of trips (call-in/call-out cycles), based on observed landings, May 1997, February through April 1998**



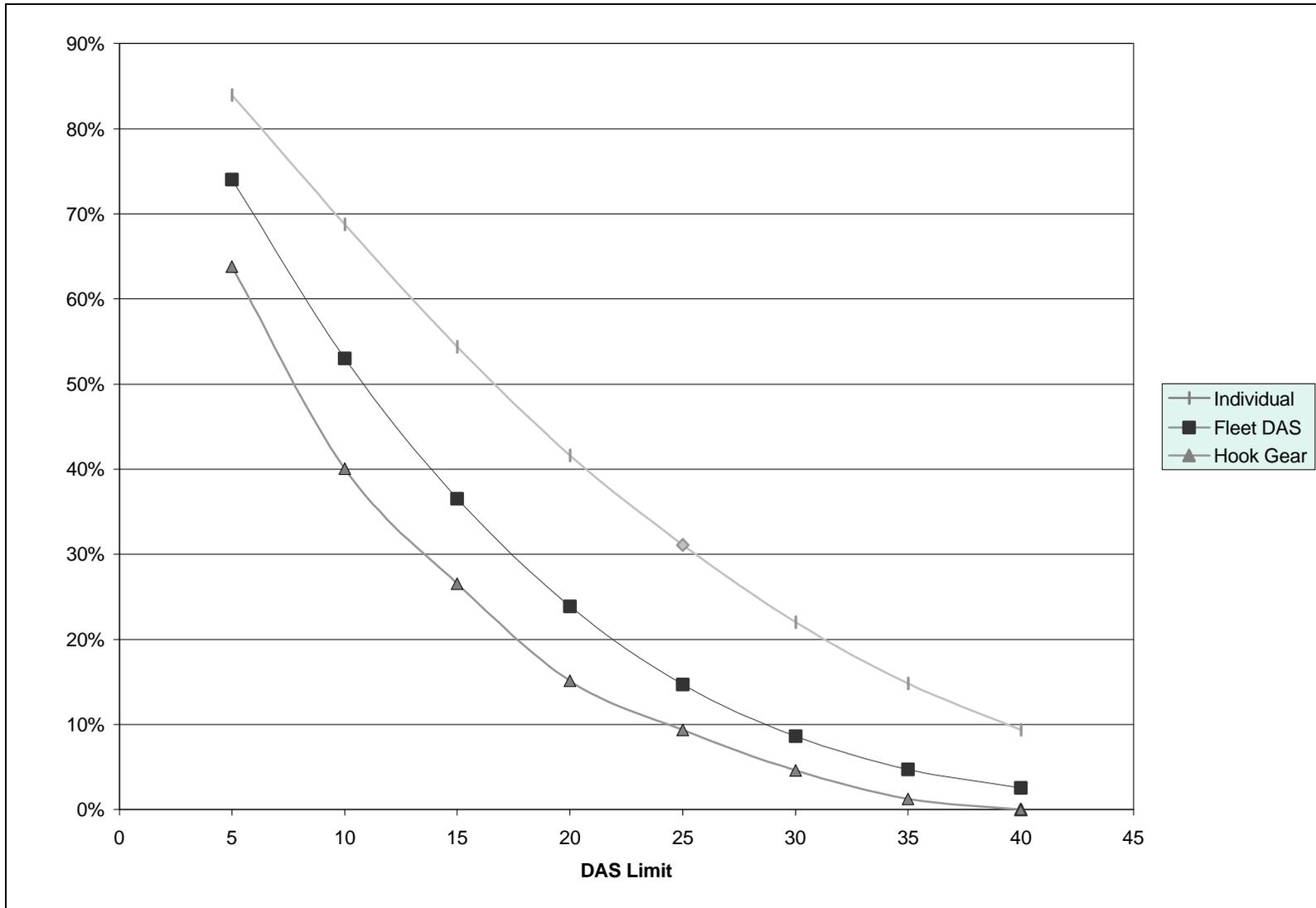
<b>DAS Limit</b>	<b>Individual</b>	<b>Fleet</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet</b>	<b>Total</b>
40	9%	3%	0%	0%	0%	4%
35	15%	5%	1%	0%	0%	7%
30	22%	9%	5%	0%	0%	12%
25	31%	15%	9%	0%	0%	19%
20	42%	24%	15%	2%	0%	28%
15	54%	37%	27%	26%	0%	41%
10	69%	53%	40%	51%	20%	57%
5	84%	74%	64%	75%	54%	76%

**Table 44 – Percent of DAS used by each permit category constrained by a given DAS limit, based on observed effort, May 1997, February through April 1998**

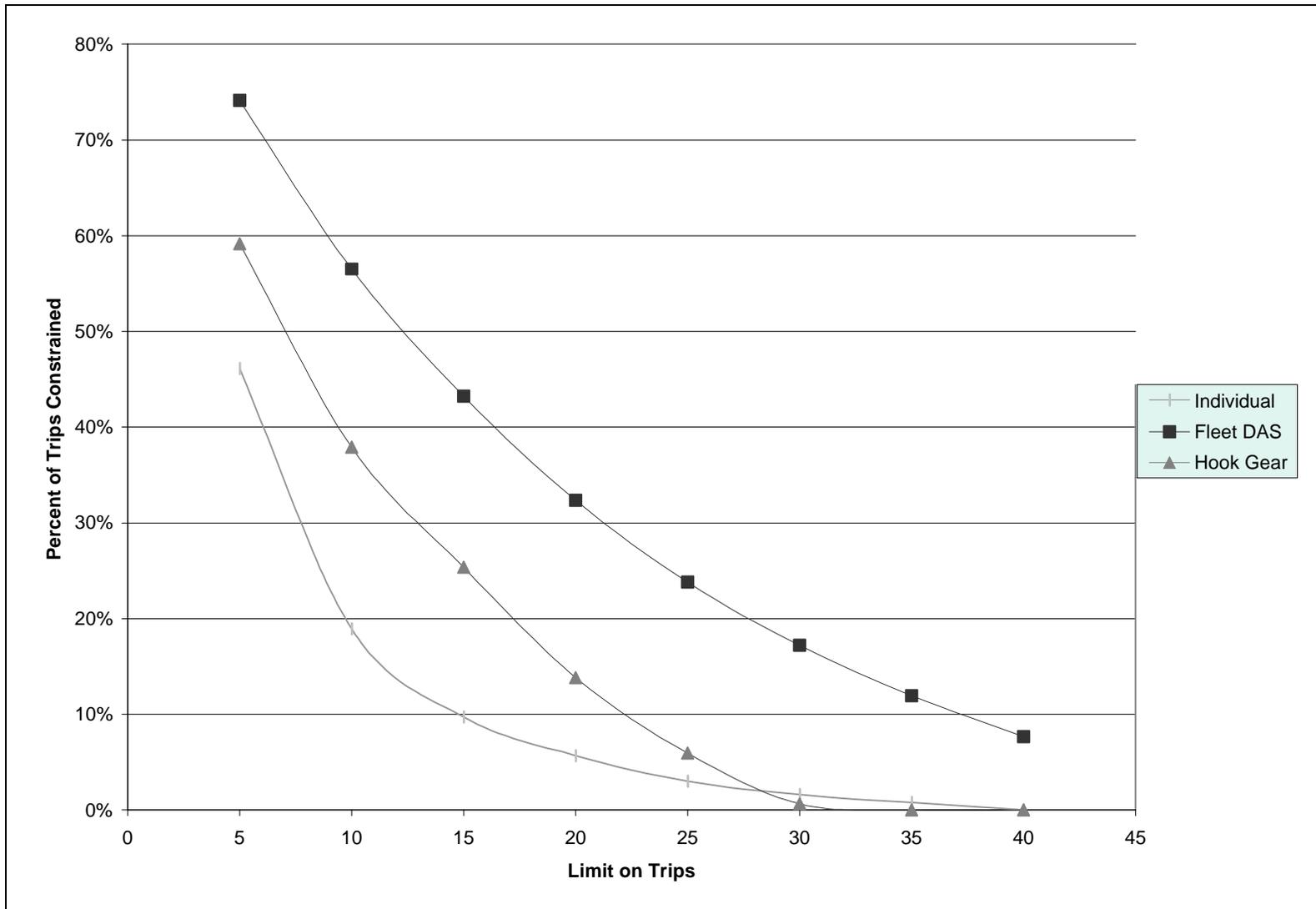
<b>Trip Limit</b>	<b>Individual</b>	<b>Fleet</b>	<b>Hook Gear</b>	<b>Combination</b>	<b>Large Mesh Fleet</b>	<b>Total</b>
40	0%	8%	0%	0%	0%	7%
35	1%	12%	0%	0%	0%	10%
30	2%	17%	1%	0%	0%	15%
25	3%	24%	6%	0%	0%	21%
20	6%	32%	14%	0%	0%	29%
15	10%	43%	25%	0%	13%	39%
10	19%	57%	38%	0%	37%	52%
5	46%	74%	59%	0%	63%	71%

**Table 45 – Percent of trips (call-in/call-out cycles) taken by each permit category constrained by a given limit on number of trips, based on observed effort, May 1997, February through April 1998**





**Figure 35 – Percent of DAS used in the Gulf of Maine during May 1997, February through April 1998, that would have been constrained by a given limit on DAS, by permit category**



**Figure 36 - Percent of trips (call-in/call-out cycles) in the Gulf of Maine during May 1997, February through April 1998, that would have been constrained by a given limit on number of trips, by permit category**

The following tables show the monthly DAS usage by gear sector and vessel size class (Table 46) and the percentage of DAS used by gear sector and vessel size class (Table 47) in the 1998-1999 fishing year (all multispecies vessels). Table 47 results are also shown graphically in Figure 37 - Figure 40. These figures indicate that different gear sectors have noticeably different DAS usage patterns, with otter trawls vessels using a greater percentage of DAS in the spring, gillnet vessels in the summer, and hook vessels in the winter. Effort usage patterns in 1999 are likely to be significantly different as vessels in the Gulf of Maine and Georges Bank anticipated or responded to changes in the management plan under Frameworks 27 and 30.



GEAR SECTOR & VESSEL CLASS (GRT)		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOTAL	
														DAS Usage	Vessels
Otter Trawl	< 5	93	69	34	14	12	21	39	28	9	5	18	15	358	8
	5 - 25	756	586	388	233	202	170	293	253	227	115	285	587	4,094	121
	26 - 50	876	843	664	477	477	428	526	584	514	390	511	813	7,102	148
	51 - 75	507	471	377	293	336	294	391	417	372	350	386	439	4,635	72
	76 - 100	358	321	372	364	346	352	303	421	290	281	367	501	4,276	65
	101 - 150	1,155	1,127	1,023	936	1,120	875	635	800	637	562	1,029	1,115	11,012	124
	150+	534	500	470	472	663	540	397	466	459	370	628	549	6,048	62
	<b>SUM</b>	<b>4,280</b>	<b>3,916</b>	<b>3,327</b>	<b>2,790</b>	<b>3,156</b>	<b>2,680</b>	<b>2,583</b>	<b>2,969</b>	<b>2,508</b>	<b>2,073</b>	<b>3,224</b>	<b>4,019</b>	<b>37,525</b>	<b>600</b>
Gillnet	< 5	14	11	11	11	10	8	8	7	2	0	0	0	81	2
	5 - 25	418	666	613	448	566	460	397	309	255	126	178	308	4,744	94
	26 - 50	298	321	240	172	239	206	228	217	231	97	106	291	2,646	43
	51 - 75	16	40	49	47	58	66	42	51	46	39	44	56	553	6
	<b>SUM</b>	<b>746</b>	<b>1,039</b>	<b>912</b>	<b>677</b>	<b>872</b>	<b>739</b>	<b>676</b>	<b>584</b>	<b>534</b>	<b>261</b>	<b>328</b>	<b>655</b>	<b>8,024</b>	<b>145</b>
	Hook	< 5	2	0	0	1	0	0	2	4	9	7	3	3	31
5 - 25		40	85	104	127	140	70	64	186	232	153	172	180	1,553	38
26 - 50		36	61	65	74	54	24	34	54	60	38	61	68	629	8
51 - 75		14	17	18	0	0	0	2	7	0	9	9	17	93	2
76 - 100		0	0	0	0	0	0	0	0	8	13	2	10	34	2
101 - 150		0	11	16	12	3	0	0	0	8	11	13	0	75	1
<b>SUM</b>		<b>92</b>	<b>175</b>	<b>202</b>	<b>214</b>	<b>198</b>	<b>93</b>	<b>102</b>	<b>252</b>	<b>317</b>	<b>231</b>	<b>260</b>	<b>279</b>	<b>2,414</b>	<b>53</b>
Other Gear		< 5	50	47	35	63	49	26	37	49	19	18	34	35	463
	5 - 25	358	335	218	161	155	86	186	368	441	281	309	441	3,340	173
	26 - 50	39	37	45	18	33	3	7	39	35	38	67	109	469	23
	51 - 75	29	4	3	1	0	0	0	27	17	43	53	46	224	4
	76 - 100	6	9	1	0	1	0	6	6	48	38	49	58	222	5
	101 - 150	34	26	13	17	27	8	5	21	8	15	22	55	250	5
	150+	51	17	33	40	70	63	54	95	93	70	95	86	766	12
	<b>SUM</b>	<b>568</b>	<b>474</b>	<b>348</b>	<b>300</b>	<b>334</b>	<b>186</b>	<b>295</b>	<b>605</b>	<b>662</b>	<b>503</b>	<b>628</b>	<b>830</b>	<b>5,734</b>	<b>257</b>
All Gears	< 5	159	127	79	89	71	55	86	87	39	30	56	54	933	47
	5 - 25	1,573	1,672	1,323	970	1,063	786	939	1,116	1,156	675	943	1,517	13,732	426
	26 - 50	1,248	1,262	1,014	740	803	661	796	895	841	562	745	1,280	10,847	222
	51 - 75	566	533	446	342	394	360	435	503	434	441	492	558	5,504	84
	76 - 100	364	330	373	364	346	352	309	427	346	333	419	569	4,532	72
	101 - 150	1,189	1,163	1,052	964	1,149	883	640	821	653	588	1,063	1,169	11,336	130
	150+	586	517	502	512	733	603	451	561	552	440	723	635	6,814	74
	<b>SUM</b>	<b>5,685</b>	<b>5,604</b>	<b>4,790</b>	<b>3,981</b>	<b>4,560</b>	<b>3,699</b>	<b>3,655</b>	<b>4,410</b>	<b>4,022</b>	<b>3,069</b>	<b>4,440</b>	<b>5,782</b>	<b>53,697</b>	<b>1,055</b>
Unknown Gear	28	22	32	12	27	11	36	67	9	27	13	36	319	30	
Sources:	Enforcement DAS Call-in Database, Vessel Trip Report Database & Permit Database														
1. Limited Access Vessels with Multispecies DAS allocations that did not call in their trips to the call-in database during the 98/99 FY (a total of 572 vessels) have been excluded from this data.															
2. Trips in the "unknown" category have data in the DAS database but not the Vessel or Permit databases. Reasons unknown.															

**Table 46 Monthly DAS Utilization by gear sector and vessel size class, May 1998 – April 1999**

GEAR SECTOR & VESSEL CLASS		MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	TOTAL DAS Usage
Otter Trawl	< 5	26	19	9	4	3	6	11	8	3	1	5	4	100
	5 - 25	18	14	9	6	5	4	7	6	6	3	7	14	100
	26 - 50	12	12	9	7	7	6	7	8	7	5	7	11	100
	51 - 75	11	10	8	6	7	6	8	9	8	8	8	9	100
	76 - 100	8	8	9	9	8	8	7	10	7	7	9	12	100
	101 - 150	10	10	9	9	10	8	6	7	6	5	9	10	100
	150+	9	8	8	8	11	9	7	8	8	6	10	9	100
	<b>SUM</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>7</b>	<b>6</b>	<b>9</b>	<b>11</b>
Gillnet	< 5	17	14	13	13	12	10	10	8	2	0	0	0	100
	5 - 25	9	14	13	9	12	10	8	7	5	3	4	6	100
	26 - 50	11	12	9	6	9	8	9	8	9	4	4	11	100
	51 - 75	3	7	9	8	10	12	8	9	8	7	8	10	100
	<b>SUM</b>	<b>9</b>	<b>14</b>	<b>11</b>	<b>8</b>	<b>11</b>	<b>9</b>	<b>8</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>8</b>	<b>100</b>
Hook	< 5	5	0	0	4	0	0	7	13	28	23	10	10	100
	5 - 25	3	5	7	8	9	4	4	12	15	10	11	12	100
	26 - 50	6	10	10	12	9	4	5	9	10	6	10	11	100
	51 - 75	15	19	19	0	0	0	2	7	0	10	9	19	100
	76 - 100	0	0	0	0	0	0	0	0	23	40	7	30	100
	101 - 150	0	15	22	16	4	0	0	0	11	15	17	0	100
	<b>SUM</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>8</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>13</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>100</b>
	Other Gear	< 5	11	10	7	14	11	6	8	10	4	4	7	8
5 - 25		11	10	7	5	5	3	6	11	13	8	9	13	100
26 - 50		8	8	10	4	7	1	2	8	7	8	14	23	100
51 - 75		13	2	1	1	0	0	0	12	8	19	24	21	100
76 - 100		3	4	1	0	0	0	3	3	22	17	22	26	100
101 - 150		14	10	5	7	11	3	2	8	3	6	9	22	100
150+		7	2	4	5	9	8	7	12	12	9	12	11	100
<b>SUM</b>		<b>10</b>	<b>8</b>	<b>6</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>5</b>	<b>11</b>	<b>12</b>	<b>9</b>	<b>11</b>	<b>15</b>	<b>100</b>
All Gears	< 5	17	14	9	10	8	6	9	9	4	3	6	6	100
	5 - 25	11	12	10	7	8	6	7	8	8	5	7	11	100
	26 - 50	12	12	9	7	7	6	7	8	8	5	7	12	100
	51 - 75	10	10	8	6	7	7	8	9	8	8	9	10	100
	76 - 100	8	7	8	8	8	8	7	9	8	7	9	13	100
	101 - 150	10	10	9	9	10	8	6	7	6	5	9	10	100
	150+	9	8	7	8	11	9	7	8	8	6	11	9	100
	<b>SUM</b>	<b>11</b>	<b>10</b>	<b>9</b>	<b>7</b>	<b>9</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>11</b>	<b>100</b>
Unknown Gear	9	7	10	4	8	3	11	21	3	8	4	11	100	
Sources:	Enforcement DAS Call-in Database, Vessel Trip Report Database & Permit Database													
1. Limited Access Vessels with Multispecies DAS allocations that did not call in their trips to the call-in database during the 98/99 FY (a total of 572 vessels) have been excluded from this data.														
2. Trips in the "unknown" category have data in the DAS database but not the Vessel or Permit databases. Reasons unknown.														

**Table 47 Percent of monthly DAS utilization by gear sector and vessel class, May 1998-April, 1999**

### PERCENT DAS UTILIZATION FOR OTTER TRAWL VESSELS: FY 1998-1999

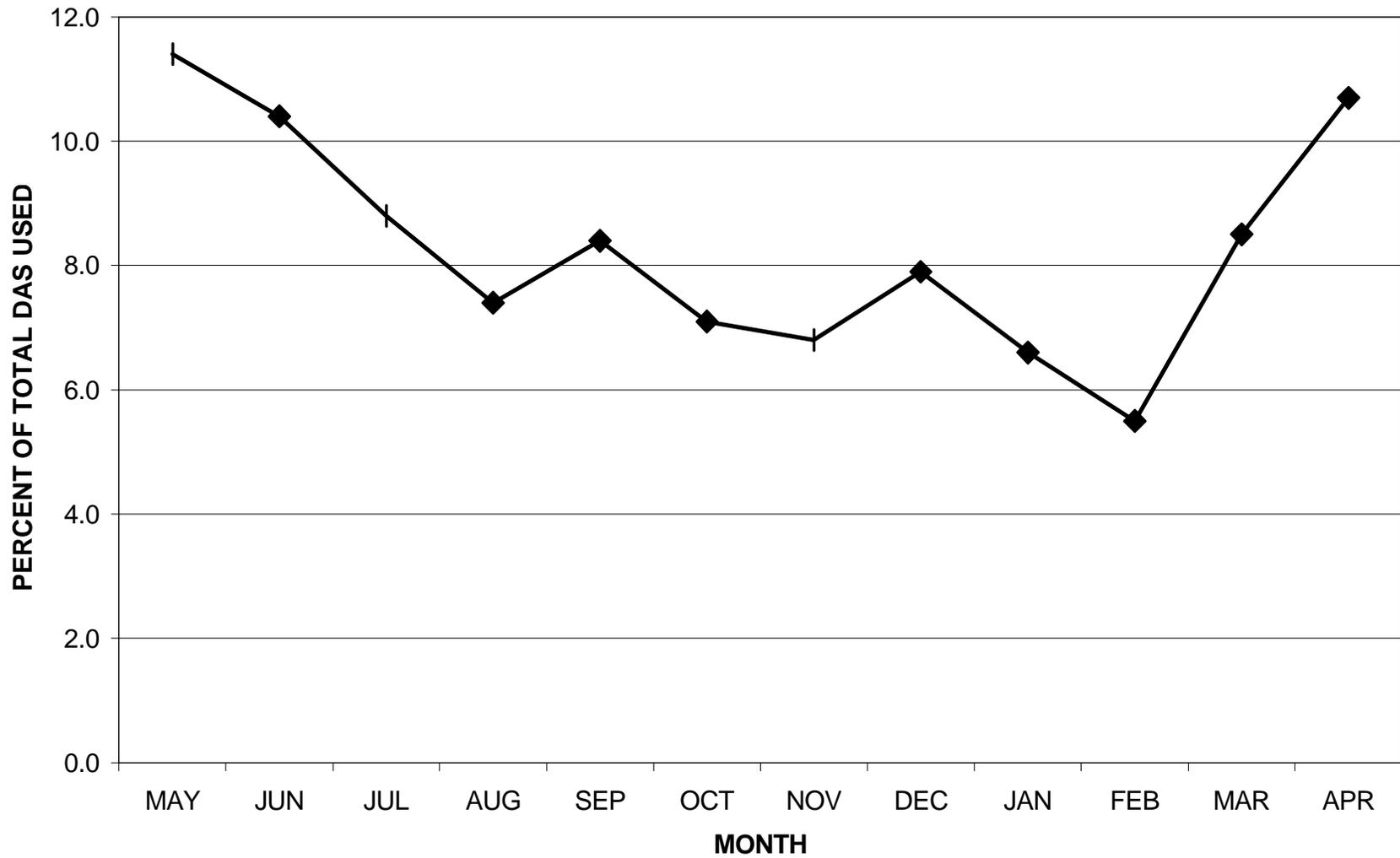


Figure 37 Percent DAS utilization by month by otter trawl vessels, May 1998-April 1999

### PERCENT DAS UTILIZATION FOR GILLNET VESSELS: FY 1998-1999

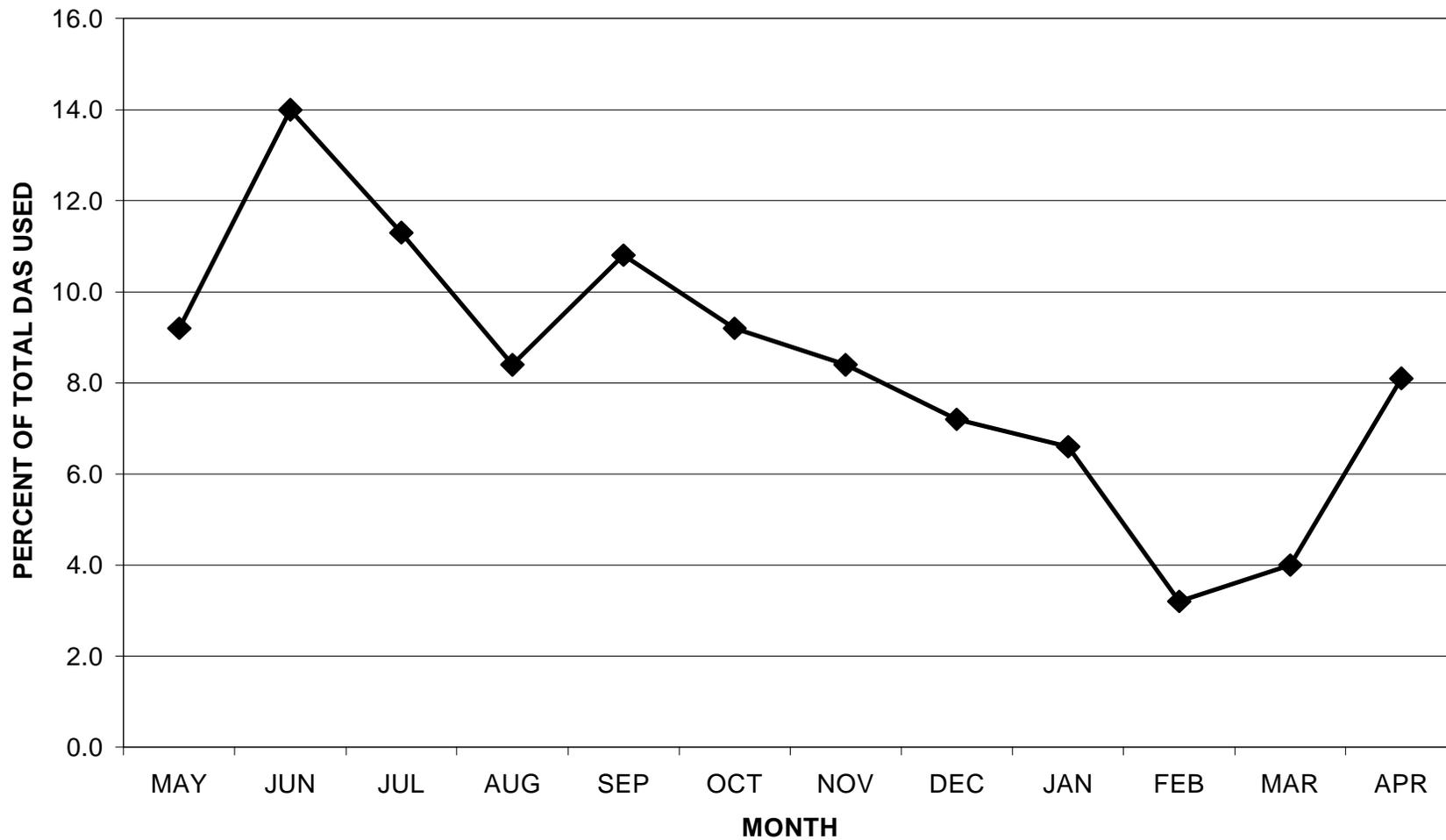


Figure 38 Percent DAS utilization by month by gillnet vessels, May 1998-April 1999

### PERCENT DAS UTILIZATION FOR HOOK VESSELS: FY 1998-1999

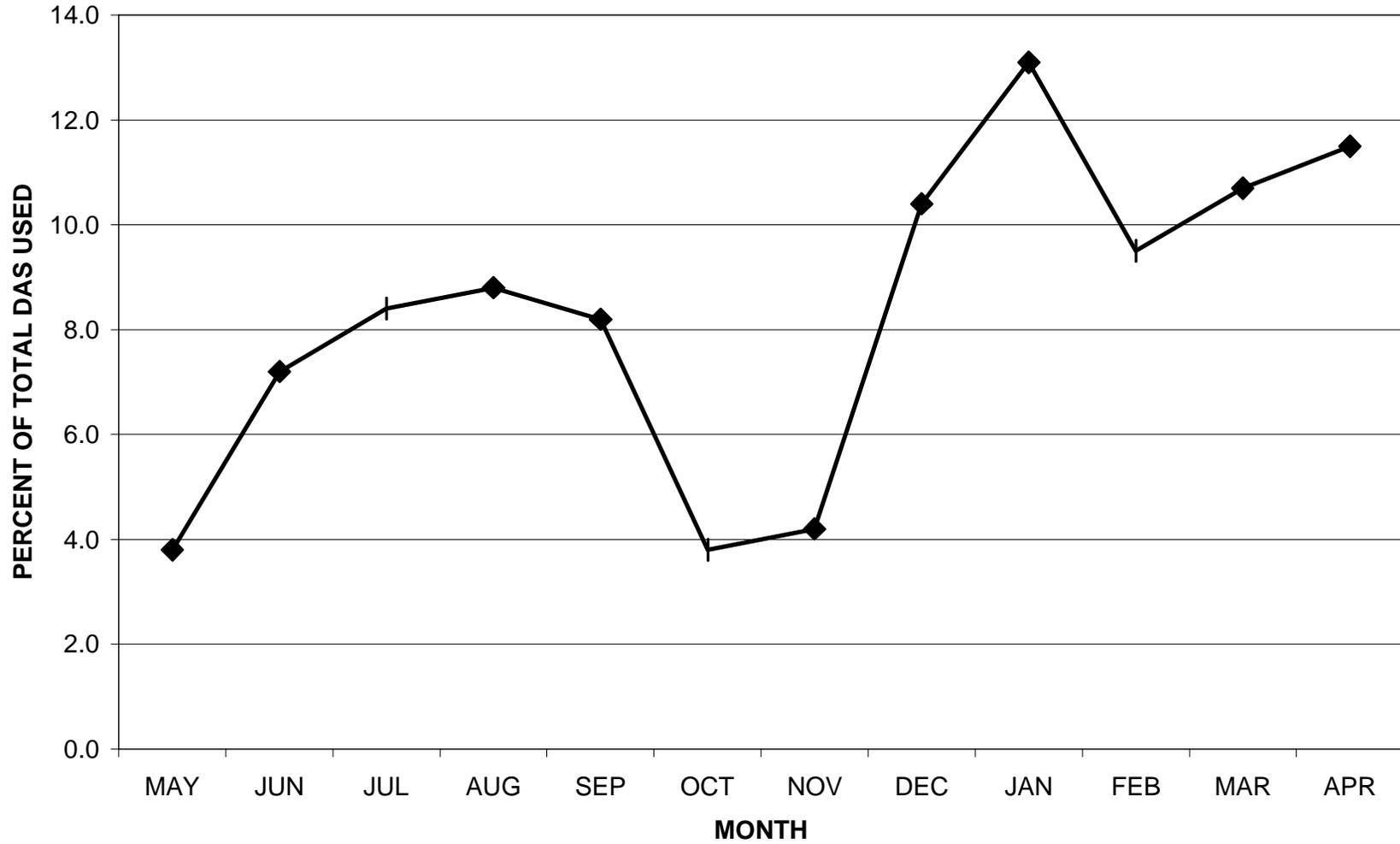


Figure 39 Percent DAS utilization by month by hook vessels, May 1998-April 1999

### PERCENT DAS UTILIZATION FOR OTHER GEAR SECTORS: FY 1998-1999

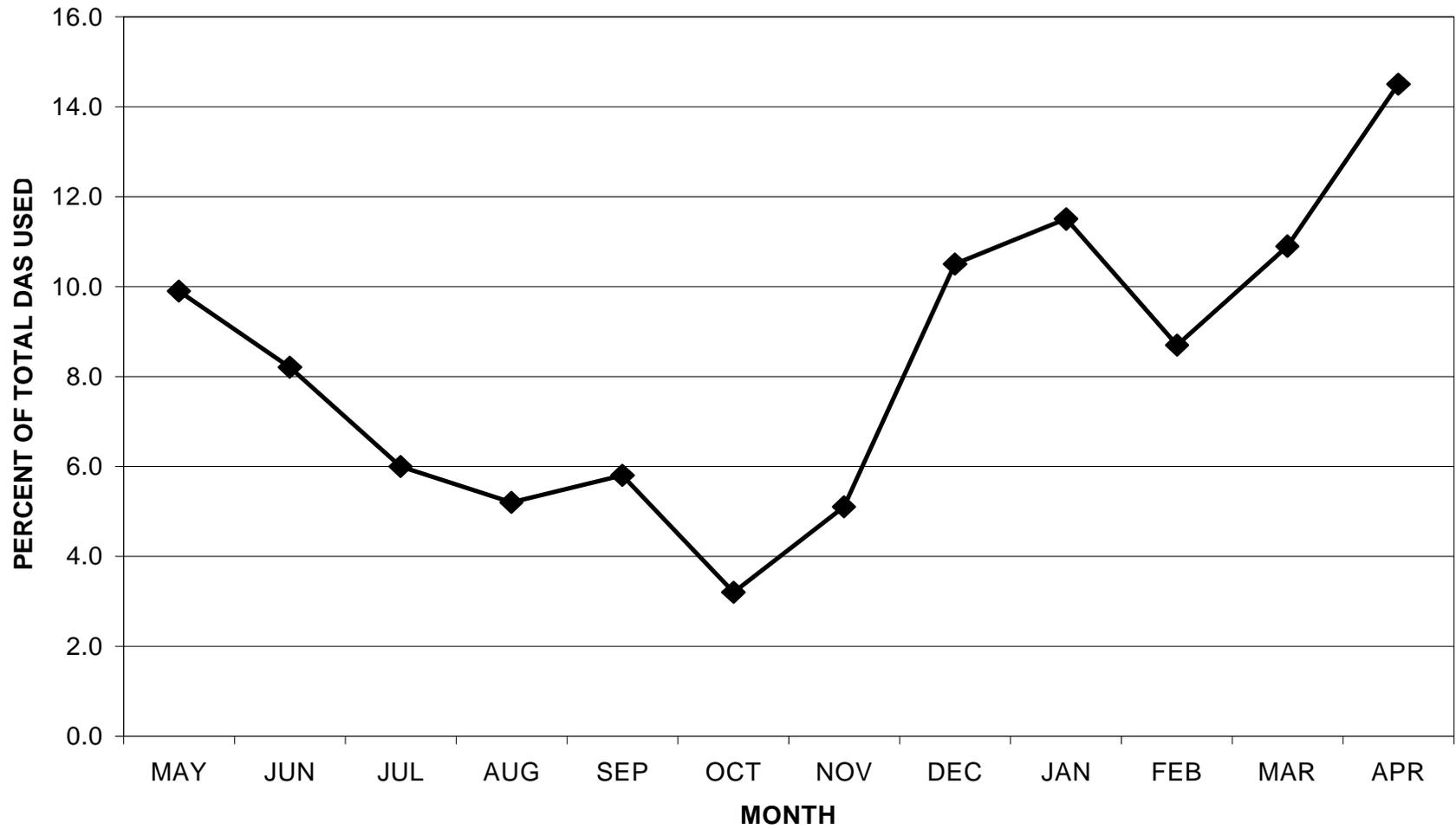


Figure 40 Percent DAS utilization by month by other gear vessels, May 1998-April 1999

#### 4.1.1.3.2 Analysis of combined effect of Option 4 measures

The size and configuration of the area closures in Options 3 and 4 prevents the use of the standard method of modeling effort shifts from closed to open areas to calculate the resulting catch expectation. The VTR and observer data is insufficient to determine catch and effort to the level of precision that would allow such an analysis. The following analysis results should be compared to the GOM target TAC to evaluate its efficacy in achieving the plan objectives. Furthermore, the analysis results are not comparable to the analysis of Options 1 and 2 that is based primarily on observed landings in 1999.

To analyze this option, the PDT first calculated the baseline catch by averaging fishing year 1998 landings with calendar year 1998 landings, resulting in a baseline of 3,500 metric tons. The PDT used this approach because in fishing year 1998 the Framework 25 rolling closures (one month closures contained in Options 3 and 4) were in effect and the trip limit with a running clock, which started at 700 pounds per day was reduced to 400 pounds per day in late June (as proposed here). On the other hand, during the 1998 fishing year, the Western GOM Closed Area was closed (and it would be re-opened under this proposal) while in the first half of calendar year 1998, a higher trip limit was in effect than is proposed here. The PDT averaged the two landings figures in an attempt to balance these differences. This calculation yielded a baseline landings of 3,500 mt.

The PDT proceeded to reduce the baseline catch by the expected impact of measures proposed in this option. Three factors are considered in the analysis of this Option. These are: (1) a 25 DAS/Trip limitation, (2) closure of 3 GOMFA –defined areas in the western Gulf of Maine, and (3), either year-round or partial closure of Cashes Ledge.

**DAS/Trip Limitation.** Analyses indicated that this measure could reduce expected landings by 7% if applied across the entire Gulf of Maine. However, the provision only applies to a portion of the Gulf of Maine. Without sufficient information to predict the outcome of a partial application of this measure, the PDT applied the simplest assumption of  $\frac{1}{2}$  of the 7% (3.5%) to account for a more realistic impact of this measure.

**Area Closures.** The PDT equated the proposed Area I and II closures with the May – December closure of the Western GOM Closed Area that was incorporated into the baseline calculation. Therefore, no additional reduction in expected landings was attributed to these area closures. The PDT then calculated the preliminary expected impact of the Area III closure. This approach assumes that Area III would be equivalent to closing the entire northern half of Block 124. It was first calculated that the northern half of Block 124 accounted for 1,065 metric tons of cod landings in 1998. This landings estimate was first reduced by 3.5% (so as not to double-count reductions already attributed to 25 DAS/trips limitation which was already applied to the baseline), and by an additional 50% (to offset double-counting of the portion of the Western Gulf of Maine Closure that is in block 124, which would be re-opened under this Option). The resulting expected reduction, if all of the landings were saved (that is, there was no effort displacement) would be 514 metric tons.

To account for uncertainty in the degree to which effort from this area would be either displaced or forfeited, the PDT considered three possible scenarios. Again, given the relatively small size of Area III and the lack of information at this level of spatial resolution, the PDT considered the most likely outcome would be halfway between a no-effort displacement and a full-effort displacement assumption, i.e. the calculated reduction in landings of 514 mt attributed to this area was reduced by 50%. To bracket the outcome, the PDT also applied a more conservative approach (25% reduction, assuming greater effort displacement and less effort forfeiture), and a more liberal approach (75% reduction, assuming lesser effort displacement and greater effort forfeiture).

Clearly, not all of the effort from this area will be displaced to other areas, nor will all of the effort be forfeited. The PDT therefore concluded that the 25% and 75% brackets represent the outer bounds of the more likely effort displacement outcomes. The areas which are being proposed for closure to replace the Western Gulf of Maine area are relatively small and, in one case, seasonal. Therefore, effort is likely to be displaced, spatially and/or temporally, to a considerable extent.

Option 4 initially included the current July – October closure of Cashes Ledge, but the designers of this measure indicated to the PDT that a year-round closure should be considered if needed to achieve the plan objectives. The PDT, therefore, analyzed both options. The total landings attributed to the Cashes Ledge Closed Area are 114 metric tons for July – October, and 254 metric tons for the full year, based on attributing one-half of the landings of blocks 129 and 130, as done in Framework 27. Reducing these savings by 3.5%, again, to avoid double counting of the 25 DAS/trips limitation measure, produces expected savings of 110 and 245 metric tons, for the part-year and full-year closure, respectively. The same 25%, 50% and 75% assumptions regarding effort displacement were also applied to these closure provisions.

1. Applying the 3.5% reduction due to the 25 DAS/Trips provision to the 3,500 mt baseline landings results in an adjusted baseline landings of 3,378 mt to be applied to the area closure provisions
2. Applying the 3.5% adjustment due to the 25 DAS/Trips provision and the 50% adjustment to the 1,065 mt landings estimate used as a basis to evaluate the proposed closure of area III results in a reduction of 514 mt, assuming no effort displacement. This value was adjusted further to account for the three more likely effort displacement scenarios.
3. Applying the 3.5% adjustment due to the 25 DAS/Trips provision to the 114 mt and the 254 mt landings estimate used as a basis to evaluate the proposed July-October and the year-round closures of Cashes Ledge results in reductions of 110 mt and 245 mt, respectively. These values were also adjusted further to account for the three more likely effort displacement scenarios.

Applying each of the above adjustments sequentially to the baseline landings estimate results in expected landings of 3,066 mt and 2,998 mt under the 50% effort displacement assumption, depending on whether Cashes Ledge is closed from July-October or year-round. When these projections are bounded by the 25% and 75% effort displacement assumptions, the expected landings range from 2,808 mt to 3,221 mt.

These results compare to an  $F_{max}$  target TAC of 1,918 metric tons. The projected landings under Option 4, therefore, are considerably greater than those corresponding to the  $F_{max}$  objective for Gulf of Maine cod. Also, this analysis did not take into consideration any biomass increase from 1998 to 2000, which would have the effect of increasing catch rates and, therefore, expected landings.

The following table summarizes the adjustments applied to this analysis.

<b>Baseline Landings</b>	3,500 mt
25 DAS/Trips adjustment 3.5% Reduction Factor = 0.965	3,378 mt

<b>Area III Closure</b>			
Base landings = 1,065 mt Adjustments: 25 DAS/trips factor = 0.965 WGOM Overlap factor = 0.5 Reduction = 514 mt	<b>Effort Displacement Assumptions</b>		
	<b>0.25</b>	<b>0.5</b>	<b>0.75</b>
	3,249 mt	3,121 mt	2,992 mt

<b>Cashes Ledge Closure July - October</b>			
Base landings = 114 mt Adjustment: 25 DAS/trips factor = 0.965 Reduction = 110 mt	<b>Effort Displacement Assumptions</b>		
	<b>0.25</b>	<b>0.5</b>	<b>0.75</b>
	3,221 mt	3,066 mt	2,910 mt

<b>Cashes Ledge Closure Year-round</b>			
Base landings = 254 mt Adjustment: 25 DAS/trips factor = 0.965 Reduction = 245 mt	<b>Effort Displacement Assumptions</b>		
	<b>0.25</b>	<b>0.5</b>	<b>0.75</b>
	3,188 mt	2,998 mt	2,808 mt

**Table 48 Summary of Option 4 projected GOM cod landings considering February – May DAS limitations and area closure proposals under a range of effort displacement scenarios.**

#### 4.1.1.3.3 Reinstating the running clock

Options 3 and 4 proposed to reinstate the running clock that was in effect prior to August 3, 1999, and add a requirement for a 2-day layover on any trip landing an overage of GOM cod. On several occasions, the Council has debated the pros and cons of various versions of the running clock. In Framework 27, the Council considered a proposal to eliminate the running clock but did not adopt this in the final proposal because it was concerned for the impact on discards and safety. The running clock measure remained unchanged until the NMFS Regional Administrator implemented the interim rule on August 3, 1999. Under this rule, which is contained in Framework 31 and continued in Options 1 and 2 in this framework, vessels on trips less than 24 hours may not land an overage and vessels on trips over 24 hours may land an overage equal to one per-day limit for a partial day provided it runs the DAS clock for the remainder of the 24-hour period. In Framework 31, the Council also considered eliminating the running clock, but instead opted to retain the limited overage provision.

The running clock lowers the cost and/or risk for fishermen who must decide whether to discard trip limit overages, remain at sea and continue fishing to account for the overages, or return to port and allow the DAS clock to run. The current proposal in both Options 3 and 4 would reinstate the running clock, except Option 4 would eliminate it during February - May. A qualitative, comparative analysis of the running clock options considered by the Council is summarized in Table 49.

The running clock was first proposed in Framework Adjustment 20 to allow vessels to land cod in excess of the trip limit and minimize the potential for discard associated with the GOM cod trip limit. The vessel's DAS allocation is reduced by the amount of time required to account for the trip's excess cod landings. Framework 24 adjusted the running clock by mandating that vessels reporting an overage in allowed (based on the length of the trip) landings of cod remain in port until the sufficient DAS have passed to equate to the cod landings. Framework 24 also required a 14-day call-in for vessels not in the GOM trip limit exemption program (that is, vessels either had to call the hail line or the DAS line within 14 days of the initial DAS call-in to start the trip). Framework 24 closed a loophole that potentially allowed vessels to direct effort on cod and while the DAS clock continued to run to account for the excess cod, continue to fish for other species.

The running clock was initially considered conservation neutral because the intent was to change discard of legal size cod into yield (no increase in mortality) while accounting for excess cod landings. The conservation neutral aspect of this measure was predicated on the assumption that fishermen would use the running clock to land excess cod overages and not use the running clock to direct on GOM cod. When the running clock was first used in the management plan, the trip limit was 1,000 lbs. per day for the first four days and 1,500 lbs. per day thereafter for vessels not enrolled in the cod trip limit exemption program. An analysis by the MSMC (1997) showed that only 8% of the cod trips in the Gulf of Maine would have exceeded these limits in May-August 1996, if they had been in place. These relatively high trip limits appeared to provide little incentive for behavioral

shifts that would increase mortality on GOM cod by combining the running clock with an increased utilization of latent effort to direct on cod.

Framework 25 lowered the GOM cod trip limit to 700 lbs. per day until 50% of the Gulf of Maine cod TAC was taken, at which time the Regional Administrator could reduce the trip limit to between 400 and 700 lbs. The 700 lbs. trip limit went in effect on May 1, 1998 and was subsequently reduced to 400 lbs. on June 25, 1998. An MSMC analysis indicated that the 23 percent of trips of 1997 cod trips in the Gulf of Maine would have exceeded these limits in June 25 through August, 1997 if they had been in place rather than the 1000/1,500 lbs. trip limit with the running clock. These more restrictive trip limits may have provided more incentive to use the running clock to target cod. Some vessels were reportedly utilizing the running clock to target cod.

The effectiveness of trip limits and running clock is predicated on behavior response of the fishermen. Excess catch may not be caught if operators move away from areas with high concentrations (avoidance behavior) or shift to other fisheries with little cod bycatch (displacement). The running clock may be used to retain excess catch (conservation neutral by converting discards into landings). However, the running clock can also be combined with latent effort (unused DAS) to maintain or increase effort on cod (maintains or increases mortality on cod).

The MSMC (1998) examined the impact of a 400 lbs. possession limit and running clock on cod landings from June 25, 1998 through August 1998. The analysis covered a range of options from totally eliminating the running clock to capping a trip limit at 10 times the daily trip limit (4,000 lbs. per trip for a 400 lbs. per day possession limit) but did not make any assumptions about discarding. Possession limits of 400 lbs. (no running clock) yielded 15.8% reduction in cod landings and the 4,000 lbs trip limit yielded only a 1.4% reduction in landings.

The impact of the running clock under the very low trip limits in the current fishing year (30 or 100 pounds per day, pending NMFS implementation of Framework 31) cannot be assessed, even if all of the landings data were available up to the current date. Under these low trip limits, the incentive to use the running clock is minimized, because the returns (in terms of allowed cod landings) do not offset the cost (in terms of DAS consumed by the running clock). Therefore, more vessels are likely discarding overages, and since those discards are not accounted for, the actual catch rates are not known.

At the vessel level, there are two basic responses to exceeding the trip limit without the running clock: extend the trip and fish for other species, or discard cod. Discarding excess cod catch negates the effectiveness of the trip limit and/or eliminating running clock. Deciding to extend the trip (remain at sea) to account for the cod overages rather than discard, on the other hand, raises safety concerns. If the proposed area closures capture the areas of high cod catch rates (in excess of the per-day trip limit), then a running clock is not needed because of the low frequency that catches would exceed the limit. On the other hand, if areas are open where there is an expectation of cod catches in excess of the

trip limit, a running clock would reduce the amount of discards, thereby increasing yield and improving the accounting of catch in the database.

During February through April, 1999, vessels operated under a 400 pound per day trip limit with no maximum possession limit, and no restrictions on the use of the running clock. Framework 31 contained an analysis of the landings during that period. Based on the VTR data, ninety-one percent of trips landing Gulf of Maine cod were below the trip limit. However, the 9 percent of trips over the limit accounted for 39 percent of the GOM cod landings. Twenty-three percent of the total landings in that period were in excess of the per-day limit (total landings minus allowed landings with no overages). As noted, the impact of eliminating or restricting the ability to land overages under the running clock depends on whether fishermen are targeting cod (and will avoid catching it if they cannot land it) or whether they are catching it incidental to other activities, resulting in discards of the overage. If the former is true, then the Option 4 proposal to suspend the running clock will greatly reduce the catch of GOM cod during this period. If the latter is true, then compared to the 1999 period the modification to the running clock will result in increased discards.

PROS	CONS
<b>ELIMINATE THE RUNNING CLOCK:</b> Not an option under consideration in Framework 33	
<ul style="list-style-type: none"> <li>+ Minimizes opportunity for directed fishing depending on trip limit level</li> <li>+ Increases effectiveness and enforceability of trip limit</li> <li>+ Increases ability to accurately estimate true fishing effort through DAS usage (no “frontloading” trips and no running the clock after landing means that DAS reported are closer to actual DAS fished)</li> </ul>	<ul style="list-style-type: none"> <li>- May cause discards depending on trip limit level</li> <li>- Vessels with overages must choose between discarding remaining at sea (safety concerns)</li> <li>- Limits flexibility to plan fishing trips</li> </ul>
<b>OPTION 1 AND 2 RUNNING CLOCK:</b> 10-day cap on trip limit; running clock limited to one day’s overage; trips less than 24 hours may not land overages and may not start another trip until 24 hours have elapsed	
<ul style="list-style-type: none"> <li>+ Reduces opportunity for directed fishing depending on trip limit level</li> <li>+ Prevents dayboats from making more than one trip per 24-hour period</li> <li>+ Promotes safety at sea (somewhat) by allowing vessels to return to port with one day’s cod overage</li> </ul>	<ul style="list-style-type: none"> <li>- May cause discards depending on trip limit level, especially on trips longer than five days</li> <li>- Five-day cap unfair to vessels on longer trips</li> <li>- Decreases ability to accurately estimate true fishing effort through DAS usage</li> <li>- Difficult to interpret for compliance and enforcement</li> <li>- Very difficult to enforce trip limits with any running clock</li> </ul>
<b>OPTION 3 and 4 RUNNING CLOCK:</b> “old” running clock with an additional two-day layover requirement following any trip landing an overage	
<ul style="list-style-type: none"> <li>+ Prevents vessels from making back-to-back trips during periods of high catch rates (spreads concentrations of fishing effort out across time)</li> <li>+ Promotes safety at sea by allowing vessels to return to port with a cod overage</li> <li>+ Running clock provides flexibility</li> </ul>	<ul style="list-style-type: none"> <li>- May not prevent directed fishing if two-day layover requirement does not discourage vessels</li> <li>- High cost to vessels (DAS + layover days) may cause vessels to discard rather than land overages</li> <li>- Layover requirement limits ability to plan fishing trips</li> <li>- Decreases ability to accurately estimate true fishing effort through DAS usage</li> <li>- Very difficult to enforce trip limits with any running clock</li> </ul>
<b>FRAMEWORK 27 RUNNING CLOCK WITH TEN-DAY MAXIMUM POSSESSION LIMIT:</b> “old” running clock with a ten-day cap; not an option in Framework 33	
<ul style="list-style-type: none"> <li>+ Reduces the potential for high levels of discards depending on trip limit level</li> <li>+ Promotes safety at sea by allowing vessels to return to port with a cod overage</li> <li>+ Provides some flexibility in planning fishing trips</li> </ul>	<ul style="list-style-type: none"> <li>- Ten-day cap may not prevent directed fishing depending on trip limit level</li> <li>- Decreases ability to accurately estimate true fishing effort through DAS usage</li> <li>- Very difficult to enforce trip limits with any running clock</li> </ul>
<b>FRAMEWORK 27 RUNNING CLOCK WITH NO MAXIMUM POSSESSION LIMIT:</b> “old” running clock with no cap; not an option in Framework 33	
<ul style="list-style-type: none"> <li>+ Reduces the potential for high levels of discards</li> <li>+ Promotes safety at sea by allowing vessels to return to port with a cod overage</li> <li>+ Provides maximum flexibility in planning fishing trips</li> </ul>	<ul style="list-style-type: none"> <li>- Will not prevent directed fishing</li> <li>- Decreases ability to accurately estimate true fishing effort through DAS usage</li> <li>- Very difficult to enforce trip limits with any running clock</li> </ul>

## **Table 49 Comparative, qualitative analysis of running clock options**

### **4.1.1.4 Biological Impacts of Requirement for Party/Charter Vessels to Obtain an Exemption Certificate to Fish in any or all of the Gulf of Maine Closed Areas**

This provision would require any vessels carrying passengers for hire in any or all of the Gulf of Maine closed areas to obtain an exemption certificate. The Council considered three options under the exemption certificate would be issued for a specified time period, either three months, six months, or one year. While enrolled in the exemption program and while in possession of an exemption certificate, a vessel would be prohibited from using a Multispecies DAS regardless of whether or not it is carrying passengers for hire and regardless of whether or not it fishes in the Gulf of Maine closed areas. It is proposing the three-month alternative based on this analysis, public comment and the recommendation of the Industry Advisory Panel.

The analysis of the potential impacts of this provision is presented in Section 4.2.2.3. Eight different certification duration periods were evaluated, including a one-year duration, two six-month periods, and five three-month periods. Table 74 projects the likely number of passengers, catch of cod, catch of other groundfish species, and discards under each of the above scenarios. Under each of the various scenarios, the expected number of recreational passengers in the Gulf of Maine is close to the 1998 baseline. (Number of passengers is a good way to characterize recreational fishing effort.) The one-year certification alternative is the only alternative that is likely to produce results significantly different than the baseline. Recreational party/charter groundfish effort in the Gulf of Maine may be reduced under the one-year alternative, as the analysis projects a 2.5% decrease in the number of passengers and a 6.3% decrease in the number of cod kept. However, the one-year alternative negatively affects more vessels in terms of potential loss of revenue than any other option.

The five three-month alternatives produce results (in terms of anglers and expected cod catch) that are all very similar to the baseline. The analysis projects very little difference between the baseline and any of the three-month alternative in terms of expected numbers of passengers and numbers of cod kept. The three-month alternatives can be assumed to have no biological impact on the stocks. Furthermore, these results should be interpreted as worst-case scenarios, as the analysis was conducted under the assumption that the exemption certificate would be required for the entire Gulf of Maine instead of just in the closed areas. At most, this provision is projected to affect 17 vessels (under the one-year alternative).

The most significant benefit of this provision will likely be in the form of better recreational party/charter fishing information for the Gulf of Maine. The Council wants to improve its understanding of what kind and how much recreational fishing activity occurs in the Gulf of Maine closed areas. The exemption certification program should allow NMFS and the Council to document how many and which party/charter vessels fish in the

closed areas and when. Furthermore, a three-month certification time period would help the Council to identify important party/charter months or “seasons” for fishing in the closed areas. This information could be useful to the Council in the future for streamlining or modifying exemptions to the closed areas for party/charter vessels.

**Potential for Redirection of Effort into Recreational Fisheries:** Given that any vessel choosing to enroll in the proposed party/charter certification program would be unable to call in a DAS during the enrollment period, some concern has been expressed that the certification program could provide an incentive for vessels to increase party/charter activity and consequently increase effort in the Gulf of Maine closed areas. The certification program was demonstrated to have little effect on vessels that already are heavily engaged in the party/charter business and for vessels that take passengers for hire on an infrequent basis. Vessels that engage in a mix of commercial and recreational activities will be faced with a choice of giving up one or the other sources of business income. At issue is which of the two activities holds the greater promise to make up for foregone income.

A survey of party/charter operators operating in the state of Maine was conducted during 1996. The survey collected data on operating and fixed costs for these vessels. A break-even analysis based on these data indicate that, on average, the Maine party/charter fleet was just barely covering all costs (McCay and O;Neil, 1998). Therefore, the party/charter industry may not be a particularly attractive alternative, especially when one considers the fact that in order to increase passenger revenues, it would be necessary to either increase fees or increase passengers.

The party/charter industry operates in a competitive market so that any one operator may not be able to increase passenger fees without losing customers to other carriers. Further, based on logbook records, the number of passengers taken on Gulf of Maine recreational fishing trips has declined from 88.7 thousand in 1996 to 60.7 thousand in 1998. In the face of declining demand for Gulf of Maine trips, any vessel that wants to increase market share must do so by competing for the existing pool of passengers with other established businesses. In effect, passenger demand alone provides a constraint on the ability for expansion of effort in the recreational party/charter fishery.

Although commercial fishing may not be any more profitable than party/charter fishing, there would be no need to compete for a limited number of passengers. Foregone passenger income may be more readily mitigated by increased activity in commercial fishing. Therefore, the certification program may be more likely to cause a shift to greater dependence on commercial fishing than recreational party/charter fishing. However, it is very unlikely that any shifts caused by the exemption program will significantly impact Gulf of Maine groundfish stocks or the effectiveness of the multispecies rebuilding program.

#### **4.1.2 Impacts on Georges Bank Cod**

The Council proposes to continue the current 2,000 pounds per day, 20,000 pounds maximum GB cod trip limit and add one of five area closure options to prevent catches from exceeding the TAC. It is also resubmitting a proposal that NMFS disapproved in Framework 31 that would eliminate the authority of the Regional Administrator to reduce the trip limit when 75 percent of the TAC has been landed.

##### **4.1.2.1 Trip Limits**

A bag limit analysis was used to evaluate the potential effects of trip limit regulations for cod in the Georges Bank stock area in Framework 27 and subsequently in Framework 30. The Council incorporated the GB cod trip limit into the management plan in Framework 30. The Framework 30 analysis has been updated to reflect stock conditions in fishing year 2000 as projected by the MSMC, including a 36 percent increase in biomass from 1997 – 2000, as well as the updated assessment of fishing mortality in 1997-1999.

A trip-by-trip analysis of the distribution of cod landings from Georges Bank occurring during calendar year 1997 was conducted to evaluate the potential effects of trip limit regulations during the 2000-2001 fishing year. There were 9,076 trips reported in the 1997 VTR (logbook) data base that caught (landed or discarded) at least one pound of cod on a trip occurring in the Georges Bank stock area (statistical areas 521, 522, 525, 526, 561, 562). Days absent were estimated relative to the current trip limit regulations, which allow one day of trip limit for each whole or partial day fished. For example, a vessel on a day trip, fishing for up to 24 hours, is permitted one day of trip limit, while a vessel fishing for 24 hours and 1 minute is permitted 2 days of trip limit (1 whole day and one partial day).

The use of the 1997 calendar year data to estimate the effectiveness of trip limit regulations during the 2000-2001 fishing year required that the 1997 trips be scaled to account for the projected increase in stock biomass that occurred between 1997 and 2000/2001. As stock biomass increases or declines, a given trip limit regulation becomes relatively more or less effective because catch rates change as some function of stock size.

Projections for the Georges Bank cod stock contained in the 1998 MSMC report had an 11 percent increase in exploitable biomass between 1997 and 1999. The 1999 MSMC report, which incorporated the updated assessments, indicated a projected 36 percent increase between 1997 and 2000. As noted in Framework 27 for GOM cod, the relationship between LPUE and stock size is unknown, but it was assumed that LPUE would increase as a linear function of stock size. Therefore, cod catch rates (catch/day) were increased by 11 percent (adjustment factor = 1.11) in the Framework 30 analysis, and by 36 percent (adjustment factor = 1.36) in the current analysis to account for the expected increase in catch rates due to the projected increase in stock size.

For Framework 30, the PDT referenced the trip limit analysis that was done for Framework 27. In Framework 27, the table of expected 1999 landings of Georges Bank cod at various trip limit intervals represented landings projected forward from 1997 based

on an 11% increase in exploitable biomass between 1997 and 1999. This approach assumed that  $F$  remained constant at the 1997 level (0.26) in 1998 and 1999. In Framework 30, based on the 1998 MSMC report, the trip limit analysis was revised to reflect the projection that  $F$  declined from 0.26 in 1997 to 0.22 in 1998 and for TAC calculation purposes, landings in 1999 were projected at  $F_{0.1}$  (0.18). The 1999 MSMC report, however, contained a revised 1997  $F$  (indicating a retrospective pattern in the assessment) from 0.26 to 0.53, and indicated that the  $F$  in 1998 was 0.28.

Landings were determined by summing the minimum of actual landings and the calculated trip limit (trip length (days) \* trip limit/day) from each trip during the year. For trips with landing rates below the trip limit regulation, all catch was assumed to be landed. For trips with landing rates exceeding the trip limit, landings were assumed to be the maximum level allowed under the trip limit regulation being modeled. Landings within each trip limit interval were then summed over all trips in the VTR database. Because logbook landings represent a subset of the total reported (dealer) landings, the VTR landings were adjusted proportionately to equal the total reported landings of Georges Bank cod.

Because of the changes in  $F$  between 1997 and 1999, the expected landings under the trip limit intervals must be adjusted downward from those in the Framework 27 document. In Framework 30, the adjustment was accomplished by first computing the ratio of total 1998 landings /total 1997 landings (stock-wide landings include Canadian catch). This is:  $8,243/10,453 = 0.79$ . This factor was then multiplied by the row of numbers in the Framework 27 GB cod trip limit table to produce the corrected landings adjusted for the change in  $F$  between 1997 and 1998, as shown in the second row of Table 50.

In the updated assessment in August, 1999, the change in fishing mortality rates between 1997 and 1998 was determined to be 53 percent (from  $F=0.53$  to 0.28). The 1999 fishing mortality rate was assumed to be equal to the 1998 rate (there was no change in the management regulations until the 2,000 pound trip limit was implemented in August, 1999). The current analysis, therefore, applies a reduction factor of 0.53 to the landings predicted after adjusting for the change in biomass. The two changes (in biomass and  $F$ ) would explain the differences in the trip limit analyses results in Table 50 from Frameworks 27, 30 and the current proposal.

The U.S. landings associated with the target  $F$  (0.18) in 2000 is 4,145 metric tons (U.S.), assuming 1,900 tons Canadian catch. A trip limit of 1,500 pounds per day would approximately achieve the TAC with no additional area closures. The difference between the re-computed landings at the various trip limits and the 4,145 mt TAC represent the required reductions that must be obtained from other measures such as closed areas.

The PDT discussed the potential impact of the 20,000 pound cap on the total landings when it was proposed in Framework 30. Since the GB cod trip limit only took effect on August 15, 1999, there is no more recent data by which to measure the impact of the rule. Under a trip limit of 2,000 pounds per day, only trips over 10 days that also landed more than 20,000 pounds of cod would be affected. Without having the trip-length data

available, the PDT could not quantify the impact, but qualitatively, it concluded that there would probably not be a significant reduction over what was already attributed to the 2,000 pound per day limit. Analysis provided by the Regional Office following the PDT meeting substantiated this conclusion (see Table 51).

<i>Landings in metric tons</i>	Trip Limit (Pounds/Day)										No Limit
	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
<b>1999 Landings (mt) FW 27</b>	3958	5891	6955	7528	7854	8038	8156	8234	8285	8312	8366
<b>1999 Landings Revised FW 30</b>	3127	4654	5494	5947	6205	6350	6443	6505	6545	6566	6609
<b>2000 Landings Updated 12/99</b>	2229	3435	4170	4625	4900	5076	5186	5260	5313	5350	5433

**Table 50 Comparison of Framework 27 and Framework 30 revised projected GB cod landings for the 1999/2000 fishing year (mt), and current revised projected landings for the 2000/2001 fishing year, estimated under trip limit regulations ranging from 500 pounds/day to 5000 pounds/day. The target TAC for GB cod in FY 2000 is 4,145 mt.**

	Number of Trips	Total Kept	Average Kept	Total DA	Avg. DA	Avg. Kept per DA
<b>Trips with Landings of Cod</b>	8,636	12,934,851	1,498	16,429	2	787
<b>Trips with Cod landings &gt;= 20,000 pounds.</b>	52	1,292,937	24,864	371	7	3,484
<b>Trips &gt;= 10 days.</b>	179	500,225	2,795	2,153	12	232
<b>Trips &gt;= 10 days and landed &gt;= 20,000 pounds of Cod</b>	2	42,725	21,363	20	10	2,114

Source: VTR database

**Table 51 Commercial cod landings in the 1997-1998 fishing year for trips landing over 20,000 pounds and/or ten days or more in duration.**

Vessels fishing on GB cod under a trip limit are also fishing under the haddock trip limit. Having two limits on a vessel that catches both species, often simultaneously, creates a dilemma for the operator who must decide when the first of the two limits is reached whether to stop fishing or to continue fishing to catch the allowable limit of both species. In the second instance, the vessel would have to discard the overages of the first limit. Even if the vessel moves to a different location, there is no assurance that additional cod (or haddock, as the case may be) would not be caught. Since the outcome of this situation depends on the choices individual operators must make, the tools are not available to quantitatively predict the impact with any reasonable certainty.

Reducing the trip limit to prevent exceeding the target TAC will only exacerbate the problem of discards, and will not necessarily produce the desired result of preventing catches from exceeding the target. Thus, the PDT recommended against relying on incremental reductions in the trip limit to backstop a failed trip limit. As more haddock and other species in the Georges Bank stock area are available to fishermen, the level of discarding under a restrictive trip limit will likely increase.

NMFS did not approve a Framework 31 proposal to eliminate the authority of the Regional Administrator to reduce the trip limit when landings reach 75 percent of the TAC. NMFS stated that “removal of this ‘backstop’ in order to reduce the risk of discards without any compensating conservation measures to address fishing mortality is not justified”. In the current proposal, the Council proposes additional area closures as a substitute for the potential reduction in the trip limit.

#### **4.1.2.2 Area closure analysis**

The Council considered five area closure options to be combined with the trip limit. It is proposing Option 5 based on the following analysis that indicates will keep landings near or below the TAC with a 2,000 pounds per day trip limit. As with Framework 27, each of the area closure configurations corresponding to the draft framework options was analyzed using the 2-bin effort displacement model utilizing 1997 VTR data. This model accumulates the landings and effort (days absent) associated with each month/block combination specified in each area closure proposal to form a single closure (bin 1). The landings and effort associated with the remaining (open) month-blocks are then accumulated to form a single open area (bin 2). The landings rate (landings per day absent, LPUE) corresponding to the open area is then applied to the total effort in the system to compute the expected landings under the specified closure scheme. In effect, the 2-bin model retains all of the effort in the system, and the expected landings are the product of the total system effort and the LPUE from all of the open month-block combinations. In other words, the analytical model assumes that all of the effort displaced by closing areas continues to fish in the open areas at the average catch rate for the entire open area.

The PDT analyzed the options for area closures, both area closures alone, and in combination with various trip limits initially in Framework 30. It updated the analysis for this framework as discussed in the previous section (trip limit analysis). In Framework 30, Option 1 was based on incrementally picking the block-month combinations with the highest landings. Both Options 1 and 2 were designed meet the 1999 TAC targets without a trip limit. Option 3, based on the Council request to specifically analyze closure of blocks 109-114, would have to be a year-round closure, along with a 2,000 pound per day trip limit to stay below the TAC. Option 4 was originally developed by starting with a 2,000 pound per day trip limit and incrementally closing the blocks with the highest cod catch until the projected landings were below the target TAC. The updated analysis shows similar results for Options 3 and 4, relative to the 2000 TAC. The closure in Option 5 for May was initially proposed by an industry group for Framework 30 but due to the timing of Framework 30 could not be considered. Instead the Council considered a 30-day

closure following implementation, and the Framework 30 document analyzed both June and July closures of the same area. The options are described in Table 52.

The analysis results shown in Table 53 are based on the two-bin model. This analysis indicates that landings under Option 1 would remain below the TAC under a trip limit of between 3,000 and 3,500 pounds per day, and under Option 2 between 3,500 and 4,000 pounds per day. Options 3 and 4 would remain below the TAC with a trip limit of 2,000 pounds per day, while Option 5 would require a trip limit between 1,500 and 2,000 pounds per day.

If, in contrast to the analysis assumptions about effort displacement, all effort is not displaced to open areas or does not catch cod at the average rate for the open areas, the calculated landings for a given area closure or closure/trip limit option would be lower. Put another way, a higher trip limit would achieve the goal (of landings at or below the TAC). Furthermore, for options that include both area closures and trip limits, the lower the trip limit is, the greater likelihood is that discards will replace landings, and the result (in fishing mortality) will not be as low as expected.

Modeling these two contingencies, however, involves highly subjective assumptions about behavior, such as predicting the point at which individual fishermen will stop fishing rather than discarding cod, or predicting how fishermen will redirect effort displaced from closed areas. Table 54 shows the percent change in catch attributed to each closure option, without a trip limit, if all the catch from the block/months that are closed were saved compared to the percent change resulting from the 2-bin model.

OPTIO N	BLOCKS	MONTHS
1	98	6, 7, 8, 9
	111	4, 5
	109	5
	110	5
	113	6, 7, 9
	114	5, 6
2	98, 99, 113	year-round
	114	5, 6
3	109-114	year-round
4	98	7, 8
	110	5
	111	4, 5
	113	7
	114	6
5	109-114, 98, 99	5

**Table 52 Georges Bank cod area closure options**

Trip Limit (Lbs/Day)	No new closure s	Option 1	Option 2	Option 3	Option 4	Option 5
<b>No Trip Limit</b>	5433	4400	4292	4835	4835	4944
<b>5000</b>	5350	4334	4227	4762	4762	4869
<b>4500</b>	5313	4303	4197	4729	4729	4835
<b>4000</b>	5260	4260	4155	4681	4681	4786
<b>3500</b>	5186	4200	4097	4615	4615	4719
<b>3000</b>	5076	4112	4010	4518	4518	4619
<b>2500</b>	4900	3969	3871	4361	4361	4459
<b>2000</b>	4625	3746	3654	4116	4116	4209
<b>1500</b>	4170	3377	3294	3711	3711	3794
<b>1000</b>	3435	2782	2714	3057	3057	3126
<b>500</b>	2229	1806	1761	1984	1984	2029

**Table 53 Results from the two-bin model for area closure options, showing the effect of various trip limits on Georges Bank cod. Options must show landings at or below 4,145 mt to achieve the 2000 TAC.**

	Option 1	Option 2	Option 3	Option 4	Option 5
<b>% Reduction 2-bin model</b>	19	21	11	11	9
<b>% of total catch attributed to closed blocks</b>	37	45	52	24	17

**Table 54 Comparison of percent change in catch resulting from area closures under the 2-bin model to the percent of catch attributed to each block/month combination.**

### 4.1.3 Cod minimum size increase

This proposal is part of GOM Option 3 that the Council rejected. The Council initially considered increasing the cod minimum size in Framework 30 but did not propose doing so in the final framework document. The following discussion is copied from the draft Framework 30 document.

In 1997, the mean length of age-2 fish in U.S. commercial landings was 21 inches. While U.S. vessels did not land significant numbers of age-1 fish, age-2 fish accounted for 9.0 percent of the total catch in weight and 18.7 of the total catch in numbers. About 44 percent of age-2 fish are sexually mature. In terms of market categories, scrod cod accounted for 18 percent by weight and 36 percent by number of U.S. cod landings.

A compilation of cod mesh selectivity studies by J. DeAlteris and C.Grogan at the University of Rhode Island indicates a range of  $L_{50}$  for 6-inch diamond between 18.13 and 23.86 inches. The median value is approximately 19.6 inches. Based on these data, increasing the minimum size from 19 to 21 inches would raise the minimum size of above the  $L_{50}$  for that portion of the stock that is caught by 6-inch diamond mesh. Selectivity studies for hook and gillnet gear are not available.

Without commensurate gear selectivity changes, increasing the minimum size will cause discarding to increase. Vessels that cannot land 19-21 inch fish may try to avoid concentrations of small fish, both in time and area, as there is a cost to the vessel that may not be offset by the catches of legal sized fish in the mix. Secondly, according to industry comments, a significant portion of the scrod are targeted and landed by hook vessels, especially to serve the live fish market in recent years. Hook fishermen have stated that they can fish in ways to reduce the catch of small fish (larger hooks and baits, for example) and that they can discard fish in a manner to improve survival rates. Since hook fishermen proposed this size increase, in large part to forestall a stock decline and further management restrictions in the future as several years of low recruitment enter the fishery, the Council expects that they will voluntarily operate in ways that minimize discard mortality.

The impact of discarding on fishing mortality rates and yield depends on the survivability of the discards. If survival is high, fishing mortality rates will decline, although since fish in this size range are not fully recruited to the fishery (that is, a significant portion of fish in this size range escape the gear), there would be no impact on fully recruited F. Biomass-based F rates, however, would decline. Yields would increase, depending on the proportion of discards that survive and are caught at a larger size (before dying of natural causes). The survival rates of discarded cod under the diversity of gears and circumstances in the commercial fishery cannot be ascertained, however, the Council expects that, as it is in the industry's best interest to minimize discard mortality, fishermen will take all reasonable steps to do so.

#### **4.1.4 Haddock trip limit adjustments**

The two options considered by the Council for haddock trip limits are very similar and are not distinguishable in a conventional trip limit analysis. The proposed action combines elements of both. Since the lower initial limit in Option 1 has not appeared to constrain catches nor allow excessive catches over the past year, it is unlikely that the higher limit in Option 2 will necessarily cause any significant change in total haddock catches during the period when it is in effect. The primary difference between the two options is the timing of the trip limit increase (two weeks difference) and the mechanism by which it would take effect (Regional Administrator decision or automatic). Neither of these two components will have an impact on the fishing mortality rate.

The MSMC did not evaluate the effectiveness of the haddock trip limit liberalization in 1998 and 1999. However, landings doubled in 1998 from 1997 while the fishing mortality remained about the same, and below the Amendment 7 target. The MSMC considered that the status of haddock relative to the new overfishing definitions will require a significant reduction in fishing mortality, and recommended against any measure that will allow fishing mortality to increase from the 1998 level. Therefore, the MSMC recommended against any increase in the trip limit for 2000.

The haddock trip limit during calendar year 1999 was 3,000 pounds per day/30,000 pounds maximum from January through April, and 2,000 pounds per day/20,000 pounds maximum until November 5, when the Regional Administrator increased the limit to 5,000 pounds per day/50,000 pounds maximum. During 1998, the trip limit was 1,000 pounds per day/10,000 pounds maximum from January through August, and 3,000 pounds per day/30,000 pounds maximum for the rest of the year. Landings of haddock for January-October, 1999 increased nine percent over the same period in 1998 (2,605 metric tons compared to 2,367 metric tons). These figures suggest that the increased trip limit has allowed landings to increase proportional to the biomass increase and not produced an increase in the exploitation rate. With Georges Bank haddock SSB projected to increase 23 percent from 1999 to 2000 (44,700 metric tons to 55,000 metric tons), the increased trip limit is not likely to cause the exploitation rate to increase significantly.

#### **4.1.5 Adjustment of Large Mesh permit category program**

The analysis of the impact of the proposed reduction in minimum mesh size for vessels participating in the program is constrained by two main factors: the limited number of vessels fishing under this permit, and the lack of selectivity data for 7-inch and 8-inch trawl net codends. Furthermore, the PDT cannot predict the level of participation in the permit category if the minimum mesh size were reduced from 8 inches to 7 inches. However, the purpose of this proposal is to provide an incentive for more vessels to fish with the larger mesh, thereby increasing SSB per recruit and yield per recruit, and providing an opportunity to collect the needed information about catch characteristics with the larger mesh size.

In the multispecies call-in system, vessels with F category permits (Large Mesh Individual DAS) were not found for FY98 and FY99, to date. As a result, no data and analyses are

reported for the F permit category. The following summary is for the Multispecies G (Large Mesh Fleet DAS) permit category.

There were fourteen (14) G category vessels (unique counts) for FY 98 and 12 G category vessels for FY99 to date. Total DAS allocation were 2295 DAS and 2332 DAS for FY98 and FY99, respectively. The larger DAS allocation for smaller number of vessels is possibly due to carryover DAS. DAS utilization for the period from May through November is higher for FY98 than FY99 (23.22% versus 16.75%). Generally, monthly DAS utilization percents are higher for FY98 than FY99 except June and July. (See Table 55)

In FY98, vessels in the G permit category reported landing 497,372 pounds of regulated species, with cod as the predominate species at 262,712 (53% of the total) and July as the highest retention month at 74,969 pounds (15% of the total). (See Table 56) For a comparison between FY98 and FY99, landings data for May through August were used. Total multispecies landings during the period shows a slight increase from 192,944 pounds for FY98 to 219,362 pounds for FY99. (See Table 57) A substantial increase is shown in July from 27,995 pounds in July FY98 to 71,331 pounds in July FY99. On a species basis, five species (cod, haddock, pollock, white hake and witch flounder) reported a higher kept in FY99 than FY98. For example, during the May-April period, the amount of cod kept was 139,804 pounds in FY99 versus 111,745 pounds in FY98. It should be noted, also, that in terms of the percentage increase, haddock landings are the highest, a 324% increase from 2,784 pounds in FY98 to 11,793 pounds in FY99. Each of the other five species (yellowtail, redfish, American plaice, winter flounder, and windowpane) decreased in the amount of species kept for the period from FY98 to FY99.

These statistics indicate that the level of participation in the large mesh program is insignificant, despite the 36 percent increase in allocated DAS. If additional vessels enrolled in the program, total DAS allocations would increase over current levels. The impact of the additional DAS would be offset by the impact of the larger mesh used by these vessels. However, the net impact on fishing mortality cannot be determined at this time.

Month	Number of Permits *		DAS Used		Monthly DAS % Used		Cumulative DAS % Used	
	FY 98	FY 99	FY 98	FY 99	FY 98 (2295 DAS <sup>1</sup> )	FY 99 (2332 DAS <sup>2</sup> )	FY 98 (2295 DAS <sup>1</sup> )	FY 99 (2332 DAS <sup>2</sup> )
May	9	6	62.49	54.59	2.72%	2.34%	2.72%	2.34%
June	11	8	82.48	66.29	3.59%	2.84%	6.32%	5.18%
July	8	8	64.75	106.95	2.82%	4.59%	9.14%	9.77%
August	9	7	89.84	45.22	3.91%	1.94%	13.05%	11.71%
September	8	6	85.22	57.39	3.71%	2.46%	16.77%	14.17%
October	9	5	97.2	47.29	4.24%	2.03%	21.00%	16.20%
November	9	5	51.02	12.84	2.22%	0.55%	23.22%	16.75%
December	8		54.59		2.38%		25.60%	
January	7		58.47		2.55%		28.15%	
February	6		33.34		1.45%		29.60%	
March	3		14.05		0.61%		30.22%	
April	5		44.13		1.92%		32.14%	

Source: NMFS Enforcement DAS Call-in Database

\* Unique count of all Category G permits are: 14 Vessels for the 98/99 fishing year, and, 12 vessels for the 99/00 fishing year.

<sup>1</sup> Number of Allocated days of the 14 vessels for the 98/99 fishing year = 2295

<sup>2</sup> Number of Allocated days of the 12 vessels for the 99/00 fishing year = 2332

**Table 55 Monthly DAS usage for Multispecies DAS Category G Permit vessels for the 1998-1999 fishing year and May 1999 through November 1999**

Month/Year	COD	HADDOCK	YELLOWTAIL FLOUNDER	POLLOCK	REDFISH	WHITE HAKE	AMERICAN PLAICE	WINTER FLOUNDER	WITCH FLOUNDER	WINDOWPANE FLOUNDER	Total
May-98	38,467	850	10,115	680	21	375	11,351	5,440	692	0	67,991
Jun-98	39,537	997	9,604	10,048	373	3,359	4,452	5,112	1,487	0	74,969
Jul-98	20,131	375	154	5,016	72	415	1,095	280	455	2	27,995
Aug-98	13,610	562	24	5,622	21	1,419	361	177	173	20	21,989
Sep-98	29,364	575	54	9,357	845	2,765	128	1,701	41	0	44,830
Oct-98	31,278	1,754	185	11,322	94	1,473	86	3,606	58	0	49,856
Nov-98	11,556	201	34	1,772	4	144	15	625	7	0	14,358
Dec-98	20,605	1,628	661	16,137	1	250	50	262	3	0	39,597
Jan-99	18,890	997	32,082	12,010	0	65	129	100	0	0	64,273
Feb-99	16,415	1,935	1	34,563	12	138	25	15	8	0	53,112
Mar-99	16,175	86	0	9,150	0	0	12	0	0	0	25,423
Apr-99	6,693	3,005	158	102	0	20	40	2,961	0	0	12,979
<b>Total</b>	<b>262,721</b>	<b>12,965</b>	<b>53,072</b>	<b>115,779</b>	<b>1,443</b>	<b>10,423</b>	<b>17,744</b>	<b>20,279</b>	<b>2,924</b>	<b>22</b>	<b>497,372</b>

Source: NMFS VTR and DAS call-in Databases

**Table 56 Monthly landings of groundfish for Category G vessels for the 1998-1999 fishing year (pounds, live weight)**

Month	COD		HADDOCK		YELLOWTAIL FLOUNDER		POLLOCK		REDFISH	
	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99
May	38,467	42,391	850	6,780	10,115	9,507	680	639	21	0
June	39,537	44,381	997	3,014	9,604	5,677	10,048	7,165	373	75
July	20,131	46,220	375	1,519	154	1,809	5,016	11,722	72	140
August	13,610	6,812	562	480	24	149	5,622	2,825	21	150
<b>Total</b>	<b>111,745</b>	<b>139,804</b>	<b>2,784</b>	<b>11,793</b>	<b>19,897</b>	<b>17,142</b>	<b>21,366</b>	<b>22,351</b>	<b>487</b>	<b>365</b>

Month	WHITE HAKE		AMERICAN PLAICE		WINTER FLOUNDER		WITCH FLOUNDER		WINDOWPANE FLOUNDER		Total	
	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99	FY 98	FY 99
May	375	75	11,351	2,389	5,440	5,945	692	1,156	0	0	67,991	68,882
June	3,359	556	4,452	1,432	5,112	1,948	1,487	1,796	0	0	74,969	66,044
July	415	6,855	1,095	492	280	1,104	455	1,470	2	0	27,995	71,331
August	1,419	1,480	361	133	177	142	173	934	20	0	21,989	13,105
<b>Total</b>	<b>5,568</b>	<b>8,966</b>	<b>17,259</b>	<b>4,446</b>	<b>11,009</b>	<b>9,139</b>	<b>2,807</b>	<b>5,356</b>	<b>22</b>	<b>0</b>	<b>192,944</b>	<b>219,362</b>

Source: NMFS VTR and DAS call-in Databases

**Table 57 Monthly landings of groundfish for Category G vessels for the period May – August 1998 and 1999 (pounds, live weight)**

#### 4.1.6 Impacts on other regulated species

The impact of proposed measures on other stocks managed under this FMP depends on the direct and indirect shifts in effort that result from the area closures and fishermen’s responses to the restrictive trip limits and other management restrictions. Since this framework does not contain an overall DAS reduction proposal, there is no way to accurately predict the indirect impact of measures designed to reduce catches of other individual stocks. Consequently, a quantitative analysis of the overall impacts of all of the alternatives on the range of species cannot be done.

Furthermore, for the four GOM cod options, a comparative analysis of the options’ relative impacts on other regulated species cannot be conducted for the same reasons that the analysis of impacts on cod had to be done separately. Options 3 and 4 area closures are designed to increase the opportunity for fishermen to target other species, including other regulated species by reducing the size of the areas closed. While those other stocks do not have specified management targets under the current plan, many of them, especially American plaice and white hake, require significant rebuilding programs to achieve SFA-mandated levels. Any increased fishing effort on those other stocks, will delay their rebuilding, and potentially increase the severity of measures needed to achieve rebuilding under Amendment 13.

The five Georges Bank cod area closure proposals can be analyzed using the same two-bin model, however, this analysis only shows the expected change in landings if the effort displaced by the closures catches all of the other species at the average catch per unit effort on those species in the open areas. This analysis, therefore, provides a relative estimate of the potential impact of the five options, but should not be used to estimate absolute catches.

	Option1	Option2	Option 3	Option 4	Option 5
Species					
Haddock	5.6%	-3.2%	12.3%	8.0%	5.6%
Yellowtail	10.8%	14.4%	21.9%	7.5%	4.4%
Pollock	4.3%	5.4%	24.6%	2.9%	2.3%
Monkfish	6.8%	9.0%	9.7%	4.0%	2.2%
Dogfish	-10.7%	-21.3%	-19.2%	-2.4%	-9.5%
Other Groundfish	-5.5%	-11.4%	1.9%	-1.3%	0.6%

**Table 58 Change in catch for six species calculated using the two-bin effort displacement model for five GB cod area closure options. Option 5 is the proposed action.**

#### 4.1.7 Impacts on other species

The following discussion is extracted from Framework 27 because it covers the range of impacts that are likely to occur under the proposed action.

Other major fisheries that are potentially affected by actions in this FMP because of geographical co-occurrence or use of similar fishing gear include sea scallops, monkfish, dogfish, herring, shrimp, lobsters, and pelagic hook (primarily tuna), and summer flounder fisheries. Since the fisheries for herring, shrimp, lobsters and tuna are conducted under a gear exemption that would not restrict them from fishing in closed areas, they would not be restricted by the proposed action. Therefore, there would be no direct biological impact. Effort increases in these fisheries resulting from displaced groundfish effort, particularly lobsters, shrimp and tuna, however, may have a biological impact, although the magnitude and direction of effort shifts cannot be predicted. Nevertheless, the fishery management plans for these species are based on biological reference points and contain provisions to control effort that would otherwise compromise their conservation goals.

The fisheries for sea scallops, monkfish, summer flounder and dogfish are managed under existing or pending FMPs that are designed to control fishing mortality rates at levels that will achieve rebuilding or maximum sustainable yield. It is not possible to predict the full quantitative impact of the measures proposed in this action on all of these fisheries, considering both direct and indirect effect of each option and the changing regulatory environment for those fisheries. Qualitatively, the measures will have both positive and negative impacts depending on:

- the amount of effort that shifts into or out of those fisheries in response to their respective FMPs
- the amount of effort that shifts out of the groundfish fishery in response to these proposed measures
- the limitations on or opportunity for entry to these fisheries for displaced vessels (permit restrictions)
- the protection to those stocks within area closures or increased susceptibility to capture from increase effort outside the closures
- reduction in the amounts of overall bycatch due to DAS reduction, and
- reduction in bycatch resulting from the square-mesh size increase
- individual choices by fishermen about how and where to direct their fishing effort.

#### **4.1.8 Impacts on marine mammals and protected species**

See Volume I, FEIS for Amendment 5 to the Northeast Multispecies FMP (Section E.6.3) for a list of threatened, endangered and other marine mammal species that are likely to occur within the waters governed by the FMP, and the National Marine Fisheries Service Biological Opinion issued on November 30, 1993; also see Volume I, FEIS for Amendment 7 to the FMP (Section E.6.3.4), the associated Biological Opinion issued by NMFS on February 16, 1996 and the Biological Opinion issued on December 13, 1996 following an unusual right whale mortality event earlier in that year.

Further 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.* (1999). The reports present information on stock definition and geographic range, population size and productivity rates and known impacts. The most recent 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 and 1997).

As described more fully in Section 3.0, the actions proposed in Framework 33 are intended to reduce or maintain fishing mortality rates for five critical groundfish stocks below rebuilding targets established by Amendment 7 to the FMP, but focus on Gulf of Maine and Georges Bank cod management. Area closures would affect all gear capable of catching finfish regulated by the FMP.

Although most gear types used in the multispecies fishery have documented interactions with marine mammals, these are relatively infrequent events. The sink gillnet fishery, however, is classified as Category I in the Marine Mammal Protection Act's required *List of Fisheries*, a fishery with frequent incidental mortality and serious injury of marine mammals. A detailed description of the gillnet fishery and gear is provided in Amendments 5 and 7 to the FMP. Sea scallop dredges, which are listed as Category III on the *List of Fisheries* (with no documented takes of marine mammals), are exempt from the closures with the exception of the Western Gulf of Maine closure. The available information indicates their continued presence in these areas should not represent an increased threat to endangered or other protected species, although interactions with turtles have been documented.

With the exception of the area closures, the framework measures proposed should have few direct impacts on protected resources, including listed species, or critical habitat. The trip limits proposed fall within the range of limits that have been considered in previous consultations and the change in conditions for the Large Mesh Permit Category principally involve otter trawl gear, and therefore are not likely to affect protected resources.

Although it is difficult to predict, the area closures proposed could result in effort shifts to other fisheries, including the lobster fishery, which poses entanglement risks for large cetaceans. Small vessels that fish relatively close to shore may forego groundfish fishing during closure periods and engage in alternatives. Others could pursue groundfish offshore or relocate to ports where productive grounds are more convenient and cost-effective. Concentrated groundfish effort along the margins of the closed areas is unlikely because the closure of the most productive cod fishing grounds is fairly comprehensive. Fishing effort could increase, however, before and after the closure period and potentially represent increased risks of marine mammal entanglements.

Provided below is a detailed discussion of the impacts of the Framework 33 area closure alternatives, given that time and area closures have been a primary tool used to reduce marine mammal entanglements in the Gulf of Maine region. Because potential entanglements involve gillnet gear, analyses are limited to that gear type and the species of most concern in New England, harbor porpoise and the northern right whale.

The Protected Species Branch, Northeast Fisheries Science Center for the PDT, reviewed fishery closures proposed as options under this framework for Gulf of Maine and Georges Bank cod in relation to harbor porpoise and northern right whale distributions, and harbor porpoise bycatch, and management measures enacted under the Harbor Porpoise and Large Whale Take Reduction Plans. Gulf of Maine Option II (with a closure of the northern half of Block124) would provide the most protection for these two marine mammal species. Options I, III, and IV would provide successively less protection. Option IV would reduce protection to less than that in the two Take Reduction Plans. All of the Georges Bank options provided some additional protection for harbor porpoise and right whales beyond the current marine mammal closures.

#### **4.1.8.1 Introduction**

Over the past decade, interactions between marine mammals and fisheries have resulted in the implementation of a variety of protective measures under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA). The 1994 amendments to the MMPA specifically require the NMFS to reduce takes of all marine mammal species to below a sustainable take level referred to as the Potential Biological Removal (PBR). The ESA further requires takes of ESA listed species to be reduced effectively to zero. Measures to achieve these reductions have been promulgated under a combination of Take Reduction Plans (TRP) required under the MMPA and the “reasonable and prudent alternatives” resulting from ESA Section 7 jeopardy opinions. Fishery management actions have, in some cases, also provided protection for marine mammal species (for example, the Western Gulf of Maine or WGOM closure). In some cases, these actions have been explicitly included as part of the suite of measures which could be used to protect marine mammals (for example, the WGOM closure is recognized as a component of the Gulf of Maine-Bay of Fundy harbor porpoise stock’s TRP). When new fishery management measures are proposed, the NMFS is obliged to review the impacts of these actions with respect to the goals of the TRPs, and if appropriate, determine whether these actions would “jeopardize the continued existence” of the species (an ESA Section 7 review).

Options for new fishery closures or removal of existing time/area closures under Framework 33 to the Northeast Multispecies (Groundfish) Fishery Management Plan (FMP) have the potential to impact a variety of marine mammal species. Here we review the potential impacts on two marine mammal stocks: Gulf of Maine-Bay of Fundy harbor porpoise and North Atlantic northern right whales. Potential impacts were identified by comparing the sighting distributions of the stocks and bycatch patterns with the proposed Framework 33 closures (in combination with existing marine mammal closures). A closure encompassing more sighted or bycaught animals was considered to be more effective than one which encompassed fewer animals. Two datasets were analyzed. The first was the locations of harbor porpoise observed taken bycaught New England sink gillnets during 1995-99. These data are maintained by the NEFSC’s Fishery Observer Program, and are also used to prepare the annual assessment of harbor porpoise bycatch. The second data set includes the locations of all harbor porpoise (n = 1,712) and northern right whales (n = 5,185) sighted during surveys conducted in New England waters during 1979-98, and are archived in the University of Rhode Island’s marine mammal database. For each Framework 33 option, the proposed spatial closure was overlaid on the sightings or bycatch in each month/season, and the number of animals potentially effected was tallied.

This analysis has several limitations. First, direct impacts are difficult to predict, because the capture of marine mammals is not the intent of the fishery. Secondly, no attempt was made to consider the level of fishing effort occurring or predicted to occur in an area; all areas were considered to have the potential for being fished at the same intensity.

Thirdly, the analysis was conducted without respect to gear type, although it is recognized that some gear types have a greater potential for interaction with marine mammals than others (for example, sink gillnet fisheries traditionally take far more harbor porpoise than trawl fisheries). This concern is moot in that virtually all gear types with a significant interaction with marine mammals are prohibited from fishing in the closure areas.

Finally, the sightings data are unadjusted for the quantity and spatial/temporal distribution of sighting effort. Thus, there is a potential for bias. Certain seasons (for example, winter) and areas (for example, offshore) have been surveyed less frequently than other areas.

#### **4.1.8.2 Gulf of Maine-Bay of Fundy Harbor Porpoise Stock**

##### **4.1.8.2.1 Background**

During 1990-98, an average of 1,615 harbor porpoise were taken each year in sink gillnet fisheries between Maine and North Carolina (Rossman and Merrick 1999; Waring et al. 1999). The high level of takes during the period relative to PBR (483 animals per year; Waring et al. 1999) led to the formation in 1996 of Take Reduction Teams (one for the Gulf of Maine and one for the Mid-Atlantic). These teams, with NMFS input, produced a TRP which was implemented on 2 December 1998 (63 FR 66464). The TRP relies upon time-area closures to gillnet gear (see Figure 41 for New England closures), along with required use of pingers in some times and areas in New England and other gear restrictions in the Mid Atlantic.

Closures (whether complete or requiring pinger use) have been established in areas and times with historically high bycatch levels was high. For example, during 1999-98, an average of 1,532 harbor porpoise were estimated to be taken per year in New England waters (Table 59). Most were taken in the coastal waters of the Gulf of Maine (SA 511-515; 1,254 per year). The remaining animals were taken to the east and south of Cape Cod (SA 521-522, 537-539). In most years, the latter takes were confined to the areas directly south of Cape Cod (SA 537-539).

In developing the TRP for New England waters, the Gulf of Maine team and NMFS recognized that fishery closures would also be in effect which could contribute to reducing reduce takes to below PBR. These fishery closures included the year-around closure of the Western Gulf of Maine (WGOM) area and the series of rolling closures established under Framework 25.

In defining closure times and areas, the TRP focused on the historical distribution of bycatch and not on the distribution of harbor porpoise. Areas where both porpoise and gillnet fisheries overlapped was of concern. Most of the sightings of harbor porpoise (Figure 42) during the

winter-spring peak in bycatch have occurred outside of the inshore closure areas where animals have been typically bycaught (Figure 43). If gillnet effort were to shift significantly to offshore areas, then it is highly likely that bycatch of harbor porpoise would greatly increase in these areas.

#### **4.1.8.2.2 Impact of Framework 33 closures for Gulf of Maine Cod Stock**

**Bycatch** - During 1995-99, 96 harbor porpoise were observed taken in the New England multispecies sink gillnet fishery (Figure 43). The harbor porpoise TRP closures (exclusive of Framework 25 and WGOM closures) which became effective in December 1998, closes sink gillnet fishing in times and areas where 71% of this bycatch occurred (Table 60). The remaining 29% of the historical bycatch occurred in areas not currently protected by the TRP closures, and any future bycatch would be expected to occur in these areas. In reviewing the Framework 33 options, it was apparent that a significant part of the future bycatch could be eliminated through closures proposed under one or more of its options.

Option 2 (with the partial closure of area 124) has the greatest potential for further reducing Gulf of Maine harbor porpoise bycatch, as it would protect animals in almost all the areas with historical bycatch which remain unprotected under the TRP (Table 60). Option 3, which incorporates the groundfish closures under Framework 25 and much of the WGOM closure would potentially protection somewhat fewer porpoise. The partial closure of area 124, incorporated in both Option 2 and 3, is of particular importance to porpoise in that it includes a high bycatch area not currently protected under the TRP. Option IV would be the least effective, and would result in a loss of protection from the status quo due to the replacement of the WGOM closure with smaller closures on Jeffreys Ledge and Stellwagen Bank.

**Sightings** - Around 16% of the harbor porpoise sighted during 1979-98 were seen in areas potentially effected by Framework 33. From these data, Options I and II appear to encompass more sightings than Options III and IV (Table 61) during both winter and summer. Together with the TRP closures, Options I and II would encompass most of the area in which harbor porpoise have been sighted in the Gulf of Maine.

#### **4.1.8.2.3 Impact of Framework 33 closures for Georges Bank Cod Stock**

**Bycatch analysis** - Virtually all of the harbor porpoise bycatch in the Georges Bank cod stock area (Table 59) has occurred in the South Cape area (Figure 43), although a few animals have been taken at the northern edge of statistical area 522. The locations of historical bycatch south of Cape Cod are encompassed by the South Cape TRP closure.

**Sightings** - Sighting data indicate that harbor porpoise are at low densities during spring throughout Georges Bank (Figure 42), especially in the areas protected by the right whale Great South Channel closure and Closed Area I. During the remainder of the year (June-December), few porpoise are seen in the area. Each of the five closed area options presents potential small improvements over the existing protection under the TRP; none represents a loss of protection (Table 62).

### **4.1.8.3 Northern Right Whales**

#### **4.1.8.3.1 Background**

The North Atlantic northern right whale population number around 300 animals, making it part of the most highly endangered marine mammal species. Human activities, notably entanglement in fixed fishing gear, and ship strikes, are a major source of mortality for the. PBR for the stock is currently 0.4 animals per year, and fishing related mortality likely exceeds this number. As with harbor porpoise, a TRP has been implemented to reduce human-induced mortality to below PBR. The TRP incorporates both closures and gear restrictions. In New England there are two major fishery closures to gillnet gear: Cape Cod Bay (January 1- May 15) and the Great South Channel Critical Habitat Area (April 1-June 30).

Right whales overwinter in Cape Cod Bay during December-March with few sightings outside of Cape Cod Bay. Beginning in April, these animals are joined by migrants from the south and animals disperse throughout the Gulf of Maine and Georges Bank. The largest concentrations are found in the Great South Channel and Cape Cod Bay critical habitat areas (Figure 44) with smaller concentrations north of Cape Cod Bay near Stellwagen Bank and Jeffreys Ledge and to the north of Georges Bank. Right whales remain in the Gulf of Maine, particularly near Stellwagen and Jeffreys Ledge throughout the summer and fall. By December most animals have departed New England waters, except for those overwintering in Cape Cod Bay.

The existing right whale winter-spring closures were designed to cover the major foraging grounds, and encompass most of the sightings (Figure 44). Those harbor porpoise closures which allow gear with pingers do little to reduce interactions with right whales. Although, the WGOM and Framework 25 rolling closures were not considered in the development of the Large Whale TRP, the WGOM closure is now considered important for reducing interactions between right whales and gillnet gear.

Little information is available on locations where right whales become entangled in gear. Thus, the analysis here is restricted to locations where right whales have been seen over the past 20 years.

#### **4.1.8.3.2 Impact of Framework 33 closures for Gulf of Maine Cod Stock**

Potential impacts were separated into the effects of the rolling closure schemes, and the year round closures (Table 63). All of the rolling closures would have benefits for the protection of right whales. However, the expanded size of the closures under Options 1 and 2 would offer the greatest protection.

Changes in the year-round closed areas would have somewhat different effects. Option 2, which could have the most benefit for right whales, would continue the WGOM closure in combination with a year-round closure of the northern half of Block 124. Right whales using Jeffreys Ledge and its surrounding areas as well as Stellwagen Bank would receive the greatest protection under this option.

Option 4 offers the least benefit to right whales in that it provides reduced annual coverage from the status quo (127 total sightings), and limited protection from the rolling closures. This option is the only alternative providing less protection to right whales than the status quo.

#### **4.1.8.3.3 Impact of Framework 33 closures for Georges Bank Cod Stock**

The Great South Channel right whale closure area currently protects the vast majority of right whales observed in the Georges Bank area (674 sightings in the area during 1979-98). While additional groundfish closures beyond the existing closures would benefit right whales to a certain degree, none is strongly preferred based on the sightings data (Table 62).

#### **4.1.8.4 Other protected species**

Loggerhead, leatherback and Kemp's ridley turtles are known to inhabit the action area and are susceptible to entanglement in the gears used in the multispecies fishery. Green turtles are considered to be subtropical and tropical in range. Their occurrence north of Virginia is considered unusual at any time of the year. There is no reason to conclude that the fishery or the proposed action represents a major source of human-induced serious injury or mortality for sea turtles.

Although shortnose sturgeon may become entangled in multispecies gear, the possibility is remote given that they are benthic fish that mainly occupy the deep channel sections of large rivers. It is unclear whether previous accounts of takes have been Atlantic or shortnose sturgeon.

#### **4.1.8.5 Conclusions**

The management measures proposed in Framework 33 fall within the scope of consultations on previous Multispecies FMP actions. None of the measures are expected to result in the addition of adverse impacts that would change the basis for the determinations in those consultations. Measures may, overall, enhance protection of listed species, or at least maintain current levels of protection. Therefore, the actions proposed in Framework 33 may affect, but are not likely to jeopardize the continued existence of endangered and threatened species. Should activities associated with the Multispecies FMP change significantly or new information become available that alters this determination, the Council will reinitiate consultation.

Year	Gulf of Maine (511-515)	Georges Bank (521-522, 537- 539)	Total (CV)
1998	210	122	332 (46%)
1997	525	257	782 (22%)
1996	713	488	1201 (23%)
1995	819	564	1383 (27%)
1994	1705	365	2070 (19%)
1993	1305	74	1379 (18%)
1992	1127	75	1202 (21%)
1991	1989	na	1989 (32%)
1990	2889	na	2889 (32%)
<b>Average</b>	1254	278	1532

**Table 59 Total bycatch (with coefficient of variation) of harbor porpoise in the New England multispecies sink- gillnet fishery during 1990-1998.**

Season	TRP	Additional Protection by Option			
		I	II	III	IV
Winter (Jan-May)	50	10	14	13	11
Summer (June-August)	0	0	0	0	0
Fall (Sept- December)	18	3	6	5	0
<b>Total</b>	68	13	20	18	11

**Table 60 Observed harbor porpoise take by season during 1995-99 at locations currently protected by the Harbor Porpoise Take Reduction Plan (TRP), and potential additional protection conferred by Framework 33 Gulf of Maine closures.**

Season	TRP	Additional Protection by Option			
		I	II	III	IV
Winter (Jan-May)	88	55	55	23	19
Summer (June-August)	45	35	35	20	20
Fall (Sept-December)	51	1	3	0	0
<b>Total</b>	<b>184</b>	<b>91</b>	<b>93</b>	<b>43</b>	<b>39</b>

**Table 61 Sightings during 1979-98 of harbor porpoise in areas closed under Framework 33 Gulf of Maine Options I-IV.**

Species	Option				
	I	II	III	IV	V
Harbor porpoise	43	24	20	31	17
Right whale	32	44	33	32	28

**Table 62 Sightings of harbor porpoise and right whales during 1979-98 in Framework 33 Georges Bank closure options, exclusive of other closures in the same areas.**

Option	Type of Closure	January-May	June-August	September-December	Total
I	Rolling	793	0	270	1063
	Year-round	32	96	39	167
	Total				1230
II	Rolling	793	0	270	1063
	Year-round	85	168	91	344
	Total				1407
III	Rolling	313	19	0	332
	Year-round	71	142	61	294
	Total				626
IV	Rolling	313	19	0	332
	Year-round	29	39	59	127
	Total				459

**Table 63 Sightings during 1979-98 of northern right whales in proposed closed areas in Framework 33 Gulf of Maine Options I-IV.**

#### 4.1.8.6 Literature Cited

- Blaylock, R. A., J. W. Hain, L. J. Hansen, D. L. Palka, and G. T. Waring. 1995. U.S. and Gulf of Mexico Marine Mammal Stock Assessments. NOAA Tech. Mem. NMFS-SEFSC-363, 211pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1995. Status Reviews for Sea Turtles Listed Under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, MD, 139pp.
- Rossman, M. C., and R. L. Merrick. 1999. Harbor porpoise bycatch in the Northeast multispecies sink gillnet fishery and the Mid-Atlantic coastal gillnet fishery in 1998 and during January-May 1999. NEFSC Ref. Doc. 99-17. 36 p.
- Waring, G. T., D. L. Palka, P. J. Clapham, S. Swartz, M. C. Rossman, T.V.N. Cole, K. D. Bisack, L. J. Hansen. 1999. U.S. Atlantic Marine Mammal Stock Assessments. NOAA Tech. Mem. NMFS-NE-116, 182 pp.
- Waring, G. T., D. L. Palka, P. J. Clapham, S. Swartz, M. C. Rossman, T. V. N. Cole, L. J. Hansen, K. D. Bisack, K. D. Mullin, R. S. Wells, D. K. Odell, and N. B. Barros. 1999. U. S. Atlantic and Gulf of Mexico marine mammal stock assessments - 1999. U. S. Dept. Commer, NOAA Tech Memo. NMFS-NE-153. 196 p.

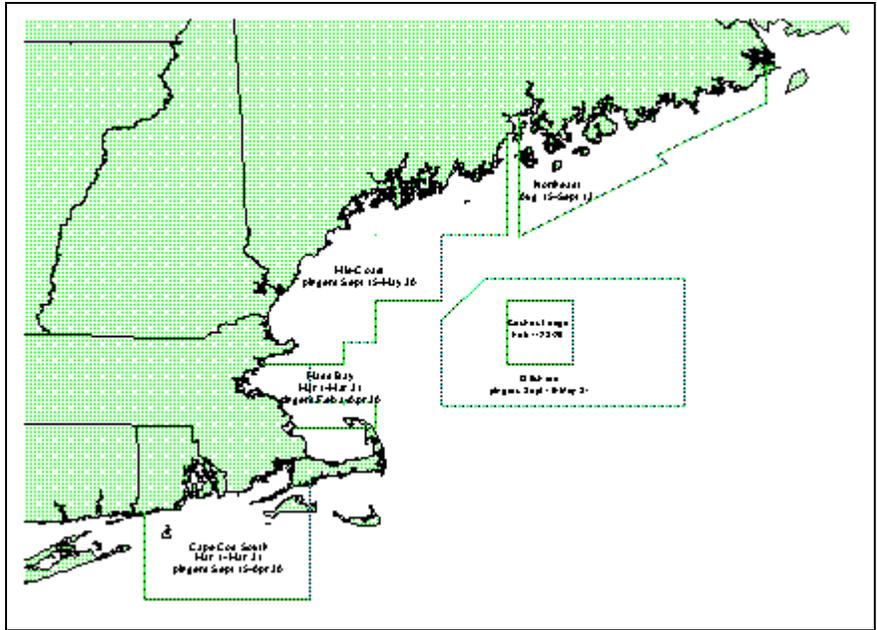


Figure 41 New England harbor porpoise Take Reduction Plan closures

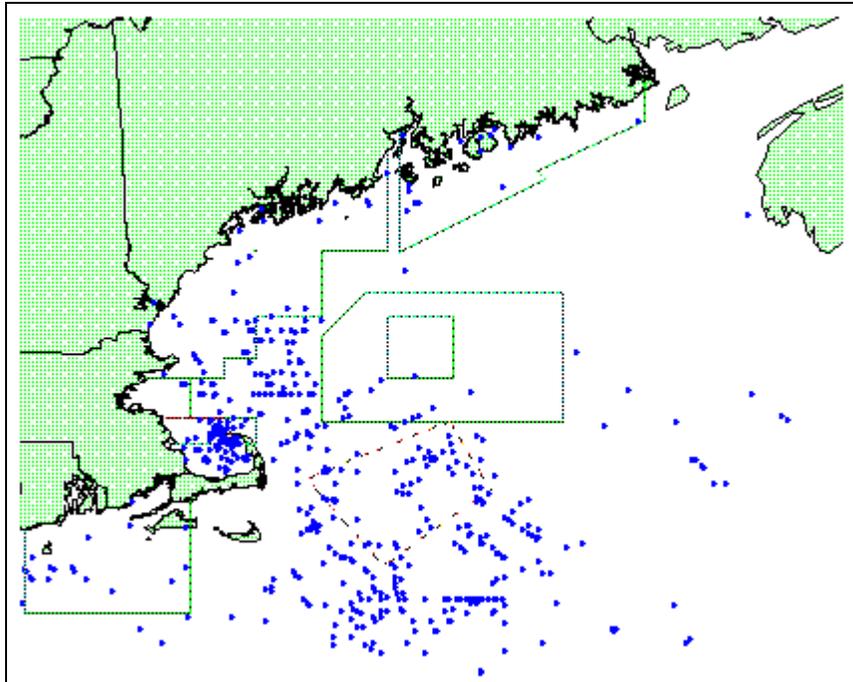
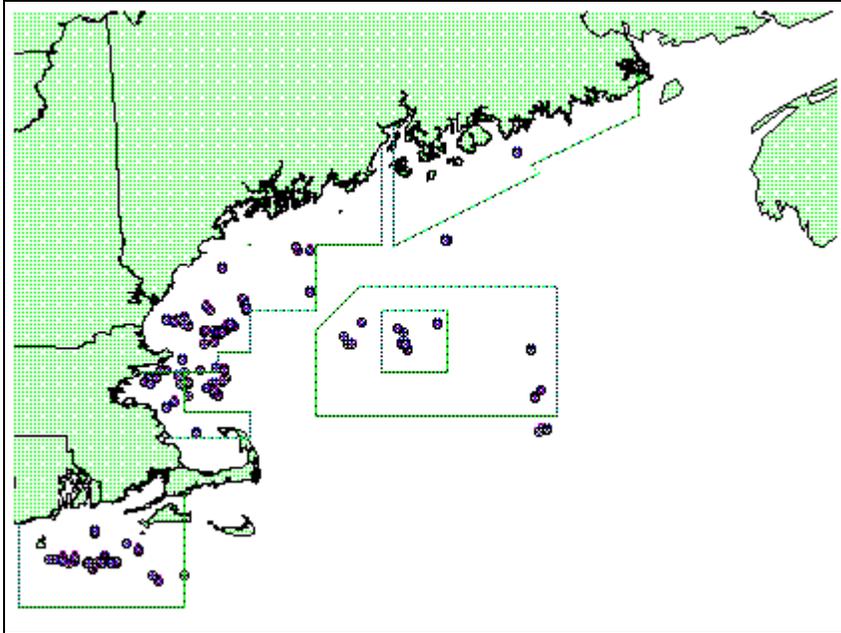
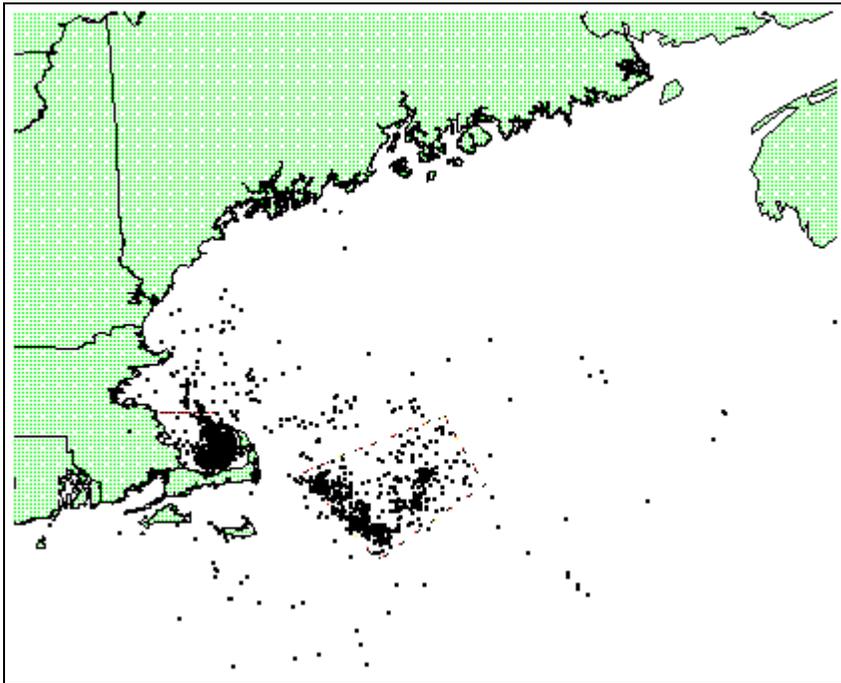


Figure 42 New England harbor porpoise sightings during spring, 1979-1998. Harbor porpoise TRP and right whale closures (dashed line) are overlaid.



**Figure 43 Gulf of Maine harbor porpoise bycatch for 1995-1998. Harbor porpoise TRP closures are overlaid.**



**Figure 44 Northern right whale spring sightings overlaid with right whale closure areas.**

#### **4.1.9 Impacts on habitat (including the EFH Assessment)**

A comprehensive description of the physical environment and assessment of the impacts to habitat resulting from fishing practices is presented in Amendment 11 to the Northeast Multispecies Fishery Management Plan. Some of the alternatives the Council considered for this framework adjustment would have adverse impacts on essential fish habitat (EFH) resulting from some fishing activity. The impact of the proposed action on essential fish habitat is summarized in the EFH Assessment (Section 4.1.9.2).

##### **4.1.9.1 Proposed Actions and Alternatives**

The following discussion includes analysis of both the proposed action and the alternatives considered and rejected. Reductions in fishing effort are one mechanism known to minimize the adverse impacts on habitat associated with fishing practices by reducing the frequency and intensity of fishing gear use. Ideally, these reductions will be focused on the sensitive habitats of the Gulf of Maine and Georges Bank that have been designated as EFH by the Council. Some of the proposed measures that could be expected to provide some benefit to the habitat of the region by directly reducing fishing effort are: days-at-sea (DAS) reductions, gear restrictions, temporary (rolling) fishing closures, and year-round fishing closures. Measures that do not directly reduce fishing effort, but rather manage how the effort is distributed among the fishing industry or the size class of fish targeted by the industry, such as permit declarations, mesh size restrictions, or minimum fish size restrictions, would not be expected to have a direct effect on the habitat of the region. Measures that increase the fishing pressure in a specific area, such as through the reopening of a previously closed area, may increase the adverse impacts on EFH above the baseline set with the submission of Amendment 11.

##### **4.1.9.1.1 Gulf of Maine cod measures**

###### **GOM Cod Option 1**

**DAS:** This measure would not significantly affect the overall amount of fishing effort in the region, especially that of bottom-tending mobile fishing gear, and should not have any effect on essential fish habitat.

**Area closures:** This measure would not increase the overall area closed temporarily or year-round to bottom-tending mobile fishing gear and other fishing gear capable of catching groundfish, but would extend the duration of these closures. Maintaining these closures will reduce any adverse impacts associated with these fishing gears within the boundaries of the areas closed to fishing. The short duration of the rolling closures makes it unlikely, however, that this would be enough to allow degraded habitat to recover. The year-round closure should allow for some recovery, but the amount of recovery cannot be quantified without the conclusions of ongoing experimental research to determine habitat recovery rates in the Gulf of Maine.

While surrounding areas may face an increase in fishing activity due to effort displacement, insufficient data prevent a quantitative analysis of the habitat impacts of effort displacement

associated with this measure. If a fraction of the fishing effort within the proposed closed areas is not displaced to other areas or seasons, the proposed closure options may decrease the impacts on habitat, especially that habitat preferred by cod. A more detailed description of the potential impacts on habitat is provided in Section 4.11 of Amendment 11, which specifically discusses the effects of effort displacement. It is also possible that concentrating fishing effort into smaller areas that remain open may have the unintended effect of increasing impacts on EFH for other species.

**Trip Limit:** This measure proposes to maintain the status quo trip limit as contained in Framework 31. As such, implementation of this measure would not be expected to have any direct effect on the habitat of the region.

**Layover Day Requirement:** This proposed measure is not expected to have a direct effect on the habitat of the region.

**Day Gillnet Vessels:** The assessment of the impacts to habitat resulting from fishing practices presented in Section 4.11 of Amendment 11 concludes that although there is some degree of impact to habitat associated with all types of fishing, the use of static gear such as gillnets is thought to introduce relatively minimal adverse impacts to fish habitat. Therefore, restrictions on the use of gillnet gear are unlikely to have any effect on habitat.

### **GOM cod Option 2**

**DAS:** This measure would not significantly affect the overall amount of fishing effort in the region, and should not have any effect on essential fish habitat.

**Area closures:** This measure may increase the overall area closed temporarily or year-round to bottom-tending mobile fishing gear and other fishing gear capable of catching groundfish, but would extend the duration of these closures. Maintaining these closures will reduce any adverse impacts associated with these fishing gears within the boundaries of the areas closed to fishing. The short duration of the rolling closures makes it unlikely, however, that this would be enough to allow degraded habitat to recover. The year-round closure should allow for some recovery, but the amount of recovery cannot be quantified without the conclusions of on-going experimental research to determine habitat recovery rates in the Gulf of Maine.

While surrounding areas may face an increase in fishing activity due to effort displacement, insufficient data prevent a quantitative analysis of the habitat impacts of effort displacement associated with this measure. If a fraction of the fishing effort within the proposed closed areas is not displaced to other areas or seasons, the proposed closure options may decrease the impacts on habitat, especially that habitat preferred by cod. A more detailed description of the potential impacts on habitat is provided in Section 4.11 of Amendment 11, which specifically discusses the effects of effort displacement. It is also possible that concentrating fishing effort into smaller areas that remain open may have the unintended effect of increasing impacts on EFH for other species.

**Trip Limit:** This measure proposes to maintain the status quo trip limit as contained in Framework 31, with some minor modifications regarding overages. As such, implementation of this measure would not be expected to have any direct effect on the habitat of the region.

**GOM cod Option 3**

**DAS:** This measure proposes to maintain the status quo DAS allocations. As such, implementation of this measure would not be expected to have any direct effect on the habitat of the region.

**Area Closures:** This measure proposes to eliminate the current groundfish GOM two-month rolling closures and the Western Gulf of Maine Closed Area, replacing them with a series of one month rolling closures, a smaller year-round closed area over Jeffreys Ledge and a temporary closed area just to the east of Cape Ann, Massachusetts. The Cashes Ledge Closed Area would remain as in the current program.

The relatively small change in the duration of the rolling closures makes it unlikely that this measure would effect any change in the ability of degraded habitat to recover. The reduction in size of the year-round closure may present an adverse impact on the essential fish habitat contained within the reopened area, as the area was closed as part of the baseline set with the submission of Amendment 11. Maintaining this closure would reduce any adverse impacts associated with these fishing gears within the boundaries of the area closed to fishing. The year-round closure should allow for some recovery, but the amount of recovery cannot be quantified without the conclusions of on-going experimental research to determine habitat recovery rates in the Gulf of Maine. Thus, the loss of opportunity for habitat to recover within the area proposed for early reopening can not be quantified, but may be significant.

At the request of the Habitat Committee, several researchers are conducting research within the boundaries of the Western Gulf of Maine Closed Area to study the interactions between habitat and fish production, impacts of fishing gear on habitat, and the recovery rates of various habitat types. The reopening of portions of this area prior to the original sunset date could threaten this important research.

**Trip Limit:** This measure proposes to maintain the status quo trip limit as contained in Framework 31. As such, implementation of this measure would not be expected to have any direct effect on the habitat of the region.

**Running clock and layover day:** The options presented in this proposal are not expected to have a direct effect on the habitat of the region.

**Increase cod minimum size to 21 inches:** This measure proposes to increase the minimum size for cod from 19 inches to 21 inches. Measures such as this that do not directly reduce fishing effort, but rather manage the size class of fish targeted by the industry, are not expected to have a direct effect on the habitat of the region.

#### **GOM Cod Option 4**

**DAS/Western Gulf of Maine Restricted Fishery Program:** These measures propose to maintain the status quo DAS allocations, with modifications restricting the spatial and temporal distribution of DAS usage. As such, implementation of this measure would not be expected to have a direct effect on the habitat of the region.

**Area Closures:** This measure proposes to eliminate the current groundfish GOM two-month rolling closures and the Western Gulf of Maine Closed Area, replacing them with a series of one month rolling closures, two smaller year-round closed area over Jeffreys Ledge and the north end of Stellwagen Bank and a temporary closed area just to the east of Cape Ann, Massachusetts. The current temporary Cashes Ledge Closed Area would be extended year-round.

The relatively small change in the duration of the rolling closures makes it unlikely that this measure would effect any change in the ability of degraded habitat to recover. Although the year-round closure of two areas currently closed only temporarily would improve the ability of these areas to recover from any adverse impacts due to the excluded fishing gears, the overall reduction in size of the year-round closure may present an adverse impact on the essential fish habitat contained within the reopened area, as the area was closed as part of the baseline set with the submission of Amendment 11. Maintaining this closure would reduce any adverse impacts associated with these fishing gears within the boundaries of the area closed to fishing. The year-round closure should allow for some recovery, but the amount of recovery cannot be quantified without the conclusions of on-going experimental research to determine habitat recovery rates in the Gulf of Maine. Thus, the loss of opportunity for habitat to recover within the area proposed for early reopening cannot be quantified, but may be significant.

At the request of the Habitat Committee, several researchers are conducting research within the boundaries of the Western Gulf of Maine Closed Area to study the interactions between habitat and fish production, impacts of fishing gear on habitat, and the recovery rates of various habitat types. The reopening of portions of this area prior to the original sunset date could threaten this important research.

**Trip Limit:** This measure proposes to maintain the status quo trip limit as contained in Framework 31. As such, implementation of this measure would not be expected to have any direct effect on the habitat of the region.

**Running clock and layover day:** The options presented in this proposal are not expected to have a direct effect on the habitat of the region.

**Party/charter access to GOM closed areas:** The assessment of the impacts to habitat resulting from fishing practices presented in Section 4.11 of Amendment 11 concludes that although there is some degree of impact to habitat associated with all types of fishing, the use of static gear such as hook and line is thought to introduce relatively minimal adverse impacts to fish habitat. Therefore, restrictions on the use of hook and line gear associated with party/charter fishing are unlikely to have any effect on habitat.

**Party/charter DAS usage prohibition:** This proposed measure is not expected to have a direct effect on the habitat of the region.

#### **Exemption for raised footrope trawl in the Gulf of Maine**

These two options propose to either exempt the raised footrope trawl fishery (a seasonal, limited area fishery) from the temporary closures in a portion of the Gulf of Maine (blocks 124 and 125) or move north the southern boundary of these closures so as to avoid conflict with the boundary of the raised footrope trawl fishery. Section 4.5 of Amendment 11 describes the potential habitat impacts associated with a raised footrope trawl, including that the impacts from this gear configuration may be less than traditional otter trawl configurations due to the reduction in contact with the bottom. Neither of these options proposes to allow fishing with the raised footrope trawl in the year-round area closures, but only in the short-duration temporary closures. This proposed measure is not expected to have a direct effect on the habitat of the region.

#### **4.1.9.1.2 GB cod measures**

##### **GB cod trip limit**

This measure proposes to maintain the status quo trip limit. As such, implementation of this measure would not be expected to have any effect on the habitat of the region.

##### **GB cod area closures**

There are five proposed options that utilize a system of temporary and/or year-round fishing area closures to reduce fishing mortality on Georges Bank cod. The increase in areas closed temporarily or year-round to bottom-tending mobile fishing gear and other fishing gear capable of catching groundfish will reduce any adverse impacts associated with these fishing gears within the boundaries of the areas closed to fishing. The short duration of the rolling closures options makes it unlikely, however, that this would be enough to allow degraded habitat to recover. The options that include year-round closures have the potential to allow for some recovery, but the amount of recovery cannot be quantified without experimental research to determine habitat recovery rates on Georges Bank.

While surrounding areas may face an increase in fishing activity due to effort displacement, insufficient data prevent a quantitative analysis of the habitat impacts of effort displacement associated with the actions proposed in these options. If a fraction of the fishing effort within the proposed closed areas is not displaced to other areas or seasons, the proposed closure options may decrease the impacts on habitat, especially that habitat preferred by cod. A more detailed description of the potential impacts on habitat is provided in Section 4.11 of Amendment 11, which specifically discusses the effects of effort displacement. It is also possible that concentrating fishing effort into smaller areas that remain open may have the unintended effect of increasing impacts on EFH for other species.

#### **4.1.9.1.3 Increase cod minimum size**

This measure proposes to increase the minimum size for cod from 19 inches to 21 inches throughout the range of cod. Measures such as this that do not directly reduce fishing effort, but rather manage the size class of fish targeted by the industry, are not expected to have a direct effect on the habitat of the region.

#### **4.1.9.1.4 Counting of first DAS of a trip**

This measure would not significantly affect the overall amount of fishing effort in the region, especially that of bottom-tending mobile fishing gear, and should not have any effect on essential fish habitat.

#### **4.1.9.1.5 GB haddock trip limit**

##### **Option 1**

This measure proposes to maintain the status quo trip limit. As such, implementation of this measure would not be expected to have any effect on the habitat of the region.

##### **Option 2**

This measure proposes to raise the trip limits for Georges Bank haddock above the status quo. Although implementation of trip limits are generally not expected to have a direct effect on the habitat of the region, a significant increase in trip limits could increase actual fishing effort. The increased trip limit could have an indirect adverse impact on the habitat of Georges Bank by increasing the amount of fishing effort associated with each DAS.

#### **4.1.9.1.6 Large Mesh Permit category**

This proposed measure is not expected to have a direct effect on the habitat of the region.

#### **4.1.9.1.7 Midwater trawl exempted fishery**

This proposed measure is not expected to have a direct effect on the habitat of the region.

#### **4.1.9.2 EFH Assessment**

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 3.1 for a description of the proposed action. The activity described by this proposed action, fishing for Gulf of Maine and Georges Bank Atlantic cod and Georges Bank haddock as well as other northeast multispecies, occurs throughout the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendments #11 and 12 to the Northeast Multispecies FMP).
- B. Analysis of the effects of the proposed action -- Although bottom tending mobile fishing gear, such as that used in the groundfish fishery, has been shown to be associated with adverse impacts to some types of bottom habitat (see Section 4.0 of Amendment #11 to the Northeast Multispecies FMP), this action does not propose to increase current levels

of fishing activity in the U.S. EEZ. Other fishing gears that may be affected by the proposed action (gill nets, hook and line, etc.) have minimal, if any, adverse impact on fish habitat.

This action proposes to delay the expiration date of the Western Gulf of Maine Closed Area for an additional year (to April 30, 2002), and continue the current system of rolling closures in the Gulf of Maine (with the provision for some limited additional temporary closures triggered if 50% of the target TAC is landed by the end of July). Extending the duration of the Western Gulf of Maine Closed Area would provide some benefit to habitat by lengthening the time this area has to recover from adverse impacts associated with fishing. This action also proposes to establish temporary closed areas on Georges Bank, but the short duration of the closures make them unlikely to allow degraded habitat to recover from adverse impacts associated with fishing.

The other measures proposed in this action (Gulf of Maine and Georges Bank cod trip limits, Georges Bank haddock trip limit, the party/charter vessel closed area exemption program, and restrictions on party/charter vessel days-at-sea usage) would have no impact on habitat. None of these proposed actions will have any direct adverse impacts on the EFH of any managed species relative to the baseline conditions established under Amendments #11 and 12.

- C. Conclusions -- The actions proposed under this framework have 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, an EFH consultation is not required.
- D. Proposed mitigation -- None required.

## **4.2 Economic impacts**

The Council considered four Gulf of Maine options and five Georges Bank options to achieve cod management objectives in these areas. The measures will impact cod landings and revenues, and also indirectly affect the landings and revenues of other species depending on the degree of effort displacement and revenue recovery from other areas and species. The economic impacts of these alternatives compared to the expected levels under the existing system are examined in this section. This section contains discussion of the proposed action as well as alternatives the Council considered and rejected.

### **4.2.1 Introduction**

#### **4.2.1.1 Summary of Impacts**

##### **4.2.1.1.1 Gulf of Maine Options**

The Council proposes Option 2 of the four options considered.

- Both Option 1 and Option 2 propose the status quo continuation of the closures contained in Frameworks 27 and 31 and also the status quo trip limit of 400 pounds/day. Therefore, no change in revenues and costs are expected with these closures and trip limits from the status quo levels for the fishing year 2000.
- Option 1 and Option 2 also extend the Western GOM Closed area for one additional year, from May 2001 to April 30, 2002. This extension will reduce the fleet revenues by \$1.8 million if there is 75 percent effort displacement or by \$7.4 million if there is no effort displacement in year 2002.
- Options 1 and 2 propose to charge a minimum of 15 to 24 hours to every fishing trip that is three hours or more in length, and thus both will have negative impacts on vessel revenues. The extent of this impact cannot be quantified, however, because some vessels may compensate for DAS-counting restriction by changing their behavior.
- Option 2 includes additional area closures which could reduce total fleet revenues by \$0.1 million (75 percent effort displacement) to \$0.6 million (no effort displacement) million if only Cashes Ledge is closed in November and blocks 124 and 125 are closed in January (the proposed action). The impacts of the closure of the Northern half of Block 124 year round (considered and rejected by the Council) would be more severe, however, ranging from \$1.4 million (75 percent effort displacement) to \$5.4 million (no effort displacement).
- Option 1 does not include any additional area closures. It does, however, contain layover day requirements and restrictions on net tags that will have negative impacts on revenues. Because these impacts, either separately or in combination of other measures, cannot be quantified at this time, it is not possible to know if the impacts of layover day requirements will be larger or smaller than the impacts of additional area closures under Option 2. Therefore, it is not possible to rank Options 1 and 2 in terms of their economic impacts.

- Since Option 3 and Option 4 include smaller area closures compared to Options 1 and 2 and the status quo, the fleet revenues are expected to increase from the status quo levels determined by Frameworks 27 and 31 measures. These options do not meet, however, fishing mortality objectives for Gulf of Maine cod.
- It is not possible to quantify the impacts of the minimum fish size and running clock and 2-day layover day requirement under Option 3. The impacts of the prohibition of party and charter boats under Option 4 from fishing in the GOM closed areas during February through May cannot be quantified either, although this prohibition is expected to have a large negative impact on the revenues of the restricted vessels.
- The longer closures of areas under Option 4 combined with the prohibition of party and charter boats will probably result in larger negative impacts on the fleet compared to Option 3. These negative impacts show only changes compared to the 1997 levels and relative to Option 3 proposals and can not compared to the impacts of Options 1 and 2. In general, the impacts of Option 3 and 4 are expected to be smaller than the impacts of Option 1 and 2, and the status quo measures that would be implemented by Frameworks 27 and 31.

#### **4.2.1.1.2 Georges Bank Measures**

The Council proposes area closure Option 5 of the five options it considered.

- The proposed area closures will have negative impacts on fleet revenues and on net economic benefits in the short-run.
- The largest reduction in revenues are estimated to occur with “no effort displacement”, that is, if the vessels are not able to recover some part of their revenues by fishing in open areas. Among the five proposed alternatives, Option 2 is estimated to have the largest negative impacts by a \$38.9 million loss, or 23.7% reduction, in fishing revenues, followed by Option 3 (\$31.9 million) and Option 1 (\$16.2 million). These numbers include the losses of the dredge sector. Option 4 would reduce the fleet revenues by \$9.4 million and Option 5 by \$6.5 million, or by 3.9 percent, including the revenues of the dredge sector.
- The revenue losses will be smaller, \$13.9 million for Option 2, and only \$0.3 million for Option 4, if the vessels were able to shift their effort fully to open areas, generate revenues per DAS at the average rate of vessels that used the same gear in the open areas.
- It is highly unlikely, however, for vessels to recover fully the revenue loss from the closed areas by fishing in the open areas. The size and horse power of some vessels may restrict their ability to fish in distant off-shore areas, so that not all effort can actually shift to open areas. As a result, the actual impacts on revenues will lie somewhere between the range of impacts estimated for the “no effort displacement” and “total effort displacement” scenarios
- The results suggest that the Option 2 has the highest cost in terms of revenues lost per metric ton of cod saved, followed by Options 3 and 5, if the dredges are not allowed to fish in the closed areas. Out of these alternatives, Option 3 has a large economic cost compared to Option 4, despite the amount of cod saved under these options are the same, i.e., 509 metric tons with a trip limit of 2000 pounds/day. Option 4 has also the lowest revenue loss per metric ton of cod saved.

- Option 2 has a high marginal cost compared to Option 1. Cod landings under Option 2 is only 92 metric tons lower than the landings under Option 1, while the revenue loss under Option 2 exceeds the revenue loss for Option 1 by more than \$12 million with total effort displacement.

#### **4.2.1.2 Summary of impacts on economic costs and benefits**

- The economic impacts represent only short-term losses from the proposed options and Table 64 provides a qualitative analysis of these short-term impacts on prices, consumer and producer surpluses and net economic benefits.
- As stated in FSEIS of Amendment 7, the rebuilding measures will have negative impacts on revenues, producer and consumer surpluses in the short-term, but will increase fleet profits, crew shares, and consumer benefits over the long-term by increasing the stock size and therefore, landings of the regulated species.

	Impact on prices	Impact on Landings	Impact on Gross Revenues	Impact on Consumer Surplus	Impact on Operating Expenses	Impact on Producer Surplus	Net Benefits
Cod trip limit (Same as status quo)	Increase compared to no trip limit	Decrease compared to no trip limit	Decrease compared to no trip limit	Decrease compared to no trip limit	Increase compared to no trip limit	Negative compared to no trip limit	Short-term Negative (No change from status quo)
Area Closures. Zero or partial Displacement of Effort	Increase	Decrease	Decrease	Decrease	Decrease	Negative	Short-term Negative
Area Closures. Displacement of Effort fully to other areas/months	No or negligible impacts	No or negligible impacts Decrease	No or negligible impacts Decrease	No or negligible impacts Decrease	Increase or negligible	Negative or negligible	Short-term Negative or negligible
Layover day requirement	May increase prices in some periods, stabilize prices	Decrease	Decrease	Decrease	Increase	Negative	Short-term negative
Counting of DAS, restriction on DAS/trips	May increase prices in some periods, stabilize prices	Decrease	Decrease	Decrease	Increase	Negative	Short-term negative
Increase in Haddock trip limit	Decrease	Positive	Positive	Decrease	Neutral	Positive	Short-term Positive (No change if status quo trip limit)
Scallop vessel access	neutral on groundfish but negative on scallops	neutral on groundfish but positive on scallops	neutral on groundfish but increase on scallop vessels	neutral on groundfish but increase for scallop consumers	neutral on groundfish but negative on scallop vessels	neutral on groundfish but positive on scallop vessels	short-term positive

**Table 64 Short term economic costs and benefits of Framework 33 alternatives**

#### 4.2.1.3 Sources of uncertainty in the analysis

- The results must be interpreted with caution because the estimated revenue impacts under any option does not take into account the price impacts. The decline of landings due to the closed areas, or due to layover day or other measures, may lead to an increase in fish prices, and partly offset the decline in revenues from reduced landings.
- Similarly, the impacts on net revenues, that is, gross revenues minus costs, will be less under each option since the variable costs will decline as effort is reduced due to the closures, layover day requirements, DAS-counting, restrictions on net tags and so on.
- Additionally, the revenue impacts are based on 1997 data for landings and revenues, and no adjustments are made to these numbers for the changes in the fishing mortality of the various species, except in the case of Georges Bank cod.

#### **4.2.2 Impact of Gulf of Maine cod measures**

The economic impacts of Options 1 and 2 are analyzed together because they contain some common measures in regard to area closures, trip limits and the counting of DAS.

##### **4.2.2.1 Impact of GOM Options 1 and 2**

###### **4.2.2.1.1 Impacts of the common measures**

- Both options propose the status quo continuation of the closures contained in Frameworks 27 and 31, and extend the Western GOM Closed area for one additional year, from May 2001 to April 30, 2002.
- The proposed trip limits are also identical, and equal to the status quo trip limit of 400 pounds per day-at-sea.
- As a result, no change in revenues and costs are expected with these closures and trip limits from the status quo levels for the fishing year 2000.
  - The Western GOM closure was scheduled to end on April 30, 2001, however, and the extension of this closure for the 2001 fishing year will reduce the revenues that could be potentially derived from fishing in this area if the scheduled opening went into effect. The revenues from Western GOM area amounted to \$7.4 million in 1997, and would be lost in full if there is no effort displacement to other areas (Table 65). It is more reasonable to expect, however, that vessels will shift their effort, and recover some part of the lost revenues by fishing in other areas. For example, a 50 percent effort displacement would result in \$3.6 million loss, and a 75 percent effort shift in a \$1.8 revenue loss if the Western GOM Closed area were extended for one more year in 2001. It should be emphasized, however, if this area was opened on May 2001, other restrictions on catch and effort would be needed to provide an equivalent cod conservation in order to meet GOM cod fishing mortality objectives.

Closures	Geartype	Effort Displacement			
		0%	25%	50%	75%
<b>Options 1 and 2</b> Continuation of FW 27 and 31 Closures	Dredge Groundfish gear	No impacts compared to status quo No impacts compared to status quo			
<b>Options 1 and 2</b> Extension of Western Gulf of Maine CA (FY 2002)	Dredge Groundfish gear <b>Total</b>	-308,304 -7,357,780 <b>-7,666,083</b>	-231,228 -5,518,335 <b>-5,749,563</b>	-154,152 -3,678,890 <b>-3,833,042</b>	-77,076 -1,839,445 <b>-1,916,521</b>
<b>Option 2 only</b> Cashes Ledge CA (Nov) and Blocks 124 & 125 (Jan) If 50 % of TAC is landed by July 31 <b>(proposed action)</b>	Dredge Groundfish gear <b>Total</b>	- 101,578 544,953 <b>646,532</b>	- 76,184 408,715 <b>484,899</b>	- 50,789 272,477 <b>323,266</b>	- 25,395 136,238 <b>161,633</b>
<b>Option 2 only</b> Northern half of Block 124 year-round	Dredge Groundfish gear <b>Total</b>	- 1,453,572 3,906,286 <b>5,359,858</b>	- 1,090,179 2,929,714 <b>4,019,894</b>	- 726,786 1,953,143 <b>2,679,929</b>	- 363,393 976,571 <b>1,339,965</b>

**Table 65. Reduction in estimated fleet revenues under Options 1 and 2 (1997 estimates in dollars). The proposed action is shaded.**

Options 1 and 2 also propose to charge a minimum of 15 to 24 hours to every fishing trip that is three hours or more in length. The Council did not adopt either of these alternatives. The impacts of charging 24 hours to every fishing trip on the number the trips taken by the groundfish vessels are analyzed in detail for all areas and separately for GOM area in Section 4.1. The results and the possible economic impacts can be summarized as follows:

- The proposal is expected to constrain the fishing activity of the vessels that use a high percentage of DAS and take a large number of short trips. The impacts will be similar to a DAS reduction.
- If the vessel operators respond to this new restriction by decreasing the number of trips taken, 28% of sink gillnets, 15% of bottom longline vessels, and 11% of bottom trawl vessels would loose trips according to the data on all vessels that used groundfish DAS in 1997. In terms of

the DAS category, 14% of fleet DAS Permits, 8% of individual DAS permits, and 2% of hook gear would be impacted.

- The impacts of the DAS counting proposals on the total DAS-used by vessels, and on their landings and revenues cannot be quantified due to the uncertainty regarding the change in fishermen's behavior. Instead of taking fewer trips, the fishermen may shorten the trips longer than 24 hours to stay within the allocated DAS while still taking the same number of trips. A vessel that is now going to be charged a minimum of 24 hours (or 15 hours) for the shorter trips may decide to actually fish the entire 24 hours, rather than sitting at the dock catching nothing. Another way to mitigate the impacts of this proposal is to allow the DAS clock to run when a vessel returns to port on a short trip.
- The impacts on revenues will be negative, however, if the vessels could only compensate partially for DAS-counting restriction by changing their behavior. These measures are also likely to increase the costs to fishermen, by reducing the flexibility in choosing the number and the length of their trips corresponding to levels that would minimize their costs and maximize their economic returns. For example, increasing trip length in response to the increase in hours charged to a trip may result in an increase in variable costs such as crew expenses and fuel, at a risk of exceeding the increase in revenues from extended fishing (see also the discussion below in regard to the layover day requirement). The 15 hours counting option will have less negative impacts, however, compared to a 24 hours counting.

#### **4.2.2.1.2 Impacts of the layover day requirement and restrictions on net tags (Option 1, rejected)**

Option 1 differs from Option 2, however, because of its layover day requirements and restrictions on the number of net tags. According to this proposal, during the months May to July, November and December all vessels not enrolled in GOM trip limit exemption program except Day Gillnet vessels, must remain in port for a period of time equivalent to the time of the trip limit, with a minimum of 24 hours. This intent of this measure is to slow pulse-fishing following the re-opening of the rolling closures and disperse effort through a longer time period. The analysis of this measure in section 4.1 and suggested that the landings of the inshore vessels could be reduced by as much as 50 percent in some months during closures (because of the layover requirement). Overall impacts will probably be less than this since the vessels may increase their effort and landings in other months when no layover day requirement is in effect. Although the available data does not allow a quantitative assessment of the net impacts, this measure will probably have some negative impacts on the revenues and costs of vessels:

- The layover day requirement may reduce the level of fishing activity and landings and revenues by reducing the flexibility in the timing of trips, and by extending the time over which the trips can be taken. It may also reduce the ability of a vessel to respond to market conditions, for example, to take more trips when fish prices are higher, and less trips when prices are lower.
- On the positive side, by reducing pulse-fishing and landings during the layover months, this measure may improve price stability. An increase in fish prices during these months might offset at least some of the revenue loss from reduced landings in the same period.

- Additionally, like any measure that restricts the timing, number and length of trips, the layover day requirement may lead to economic inefficiencies. For example, imposition of layover day requirement may extend the time over which insurance must be carried and might also increase crew and docking expenses. On the other hand, if layover day requirements reduce effort, i.e., days-at-sea used by the vessels, variable costs and insurance expenses may decline.

The Day Gillnet vessels would not be subject to layover days, instead during the months from May to July, and November to December they will be limited to fishing with 80 net tags, representing a reduction of 50 percent in allowed nets. It is uncertain, however, if this restriction in the number of net tags would translate into a 50 percent reduction in cod landings, since some boats may already be using 80 tags or fewer. In general, this measure is expected to have a negative impact on revenues of at least some gillnet vessels, although the extent of this impact cannot be assessed quantitatively. In addition, some of these negative impacts will be offset by reduction in price volatility during the pulse period as the landings are spread over a longer period of time due to the restriction on the number of net tags and the concurrent layover days in other fleet sectors.

#### **4.2.2.1.3 Impacts of additional closures (Option 2)**

Option 2 differs from Option 1 in that instead of the layover day and 80 gillnet requirement, it contained two additional area closures options:

- under the proposed action, the Cashes Ledge Closed Area in November and Blocks 124 and 125 in January will be closed if 50 percent of the TAC is landed by July 31, or
- it would close the Northern half of Block 124 year round (rejected by the Council).

These closures would have negative economic impacts on vessels by reducing the revenues from all species derived from these areas as shown in Table 65. Specifically, if half of TAC is reached by July 31, the first set of closures would reduce the fleet revenues by \$161,600 (75% effort displacement) to \$646,500 (no effort displacement) depending on the degree of effort displacement to other areas.

The impacts of the closure of the Northern half of Block 124 year round would be more severe, however, ranging from \$1.4 million (75 percent effort displacement) to \$5.4 million (no effort displacement). These impacts were estimated using 1997 landings and revenues. According to the estimates, cod fishing mortality has declined by almost 65 percent since 1997. Therefore area closures will have less impact on revenues than estimated here, since in the absence of the closures, the cod landings and revenues will be less than their 1997 levels. Additionally, no adjustments are made for the changes in the fishing mortality of the other species, therefore, total revenue reductions may differ from the values shown in Table 65.

#### **4.2.2.1.4 Summary of economic impacts for Options 1 and 2**

- The economic impacts of the status quo closures (Frameworks 27 and 31) will be identical for both options. There will be no changes in revenues and costs compared to the status quo levels.
- The extension Western GOM Closed area for one additional year (from May 2001 to April 30, 2002) will reduce fleet revenues under both options 1 and 2 compared to the status quo. The decline in total revenues may reach \$1.9 million with a 75 percent effort displacement or \$7.6 million with no effort displacement. The net impact, however, will not be as large because other effort or catch restrictions would be necessary to achieve commensurate conservation in 2001
- Both options propose to charge a minimum of 15 to 24 hours to every fishing trip that is three hours or more in length, and thus both will have negative impacts on some vessels' revenues. The extent of this impact cannot be quantified, however, because some vessels may compensate for DAS-counting restriction by changing their behavior; most vessels, those that do not use all of their DAS allocation, could compensate for this measure by merely increasing their DAS usage rate
- Option 2 includes additional area closures that could reduce total fleet revenues by \$0.1 million (75 percent effort displacement) to \$0.6 million (no effort displacement) if only Cashes Ledge is closed in November and Blocks 124 and 125 are closed in January.
- The impacts of the closure of the Northern half of Block 124 year round (not adopted) would be more severe, however, ranging from \$1.4 million (75 percent effort displacement) to \$5.4 million (no effort displacement).
- Option 1 does not include any additional area closures. It does, however, contain layover day requirements and restrictions on net tags that will have negative impacts on revenues. Because these impacts, either separately or in combination with other measures, cannot be quantified at this time, it is not possible to know if the impacts of layover day requirements will be larger or smaller than the impacts of additional area closures under Option 2. Therefore, it is not possible to rank Options 1 and 2 in terms of their economic impacts.

#### **4.2.2.2 Economic Impacts of GOM Option 3 and Option 4**

Since Options 3 and 4 contain similar proposals in regard to area closures and running clock requirement, their economic impacts are analyzed together in this section. The Council rejected these options because they did not meet the biological objectives of the FMP.

##### **4.2.2.2.1 Impacts of area closures and trip limits**

The size and configuration of the area closures in Options 3 and 4 prevents an accurate estimation of the economic impacts from these closures. The VTR and observer data is insufficient to determine catch and effort to the level of precision that would allow such an analysis. For these reasons, the discussion of impacts included in this section is mostly qualitative in nature with a few exceptions. The area closures proposed by these options include the following:

- a year round closure of GOM Area I,

- closure of GOM Area II from September 15 to November 15, and
- the implementation of the one-month rolling closures of areas that were in effect in 1998 FY (under Framework 25).
- Whereas Option 3 would close Northern half of 124 in March through August, Option 4 would close GOM Area III, which is equivalent to closing the entire Northern half of 124 year round.
- Option 3 would close Cashes Ledge Closed Area (CA) during the months July to October, whereas Option 4 would close this area year round.

The economic impacts of these closures are expected to be positive as compared to the status quo closures, since the closed areas under Options 3 and 4 are much smaller than the closures scheduled under the Frameworks 27 and 31. In general, the revenues of the fleet from all species will increase from the status quo levels, although the degree of this increase cannot be assessed quantitatively. It should be emphasized, however, that the analysis of the biological impacts in Section 4.1 indicated that these options will not achieve the conservation objectives for Gulf of Maine cod.

Option 4 closures will reduce the fleet revenues compared to the Option 3 closures because it has longer closures of the Cashes Ledge and the Northern half of 124 as Table 66 shows. If there was no effort displacement, the fleet revenues will decline by \$4.5 million (no effort displacement) to 1.1 million (75% effort displacement) under the closures proposed in Option 4 compared to ones proposed in Option 3. It must be emphasized, however, as compared to the status quo levels, there will be no additional reduction in revenues. The size of closures are smaller for Options 3 and 4 compared to both Options 1 and 2 and to status quo closures implemented by Frameworks 27 and 31. Thus the revenue reductions shown in Table 66 cannot be compared to the revenue reduction from Options 1 and 2 shown in Table 65.

Closures	Geartype	Effort Displacement			
		0%	25%	50%	75%
<b>Option 3</b>					
Northern half of 124 (Mar-Aug)	Dredge	-932,624	-699,468	-466,312	-233,156
Cashes Ledge CA (July-Aug)	Groundfish gear	-2,539,240	-1,904,430	-1,269,620	-634,810
	<b>Total</b>	<b>-3,471,864</b>	<b>-2,603,898</b>	<b>-1,735,932</b>	<b>-867,966</b>
<b>Option 4</b>				0	0
Northern half of 124 (year round)	Dredge	-1,500,604	-1,125,453	-750,302	-375,151
Cashes Ledge CA (year round)	Groundfish gear	-6,524,212	-4,893,159	-3,262,106	-1,631,053
	<b>Total</b>	<b>-8,024,816</b>	<b>-6,018,612</b>	<b>-4,012,408</b>	<b>-2,006,204</b>
<b>Difference Option 4 - Option 3</b>				0	0
	Dredge	-567,980	-425,985	-283,990	-141,995
	Groundfish gear	-3,984,972	-2,988,729	-1,992,486	-996,243
	<b>Total</b>	<b>-4,552,952</b>	<b>-3,414,714</b>	<b>-2,276,476</b>	<b>-1,138,238</b>

**Table 66: The relative impacts of Option 3 and 4 area closures - Estimated reduction in revenues from 1997 levels only (can not be compared to the impacts of Options 1 and 2)**

Since both Options 3 and 4 propose the continuation of the same cod trip limits, 400 pounds per DAS, there will be no change from the status quo levels in landings and revenues.

#### 4.2.2.2 The impacts of the additional measures proposed by Option 3 and Option 4

Options 3 and 4 would reinstate the running clock and add a 2-day layover for trips that land an overage, or retain Framework 31 overage requirements. These measures will probably have negative impacts on vessel revenues and increase costs by reducing the flexibility in the timing of trips, and by extending the time over which the trips can be taken. Under Option 4 this requirement would be suspended during February through May. In turn, Option 4 would prohibit party and charter boats from fishing in the GOM closed areas during these months. Such a prohibition would have large negative impacts on the revenues of party and charter boats, however. See Section 4.2.3, Impact of recreational measures.

Option 4 includes a proposal to limit vessels fishing in the Western Gulf of Maine Restricted Fishery Program to 25 DAS or trips (call in/call out cycles), whichever is less, during February through May. The impacts of this measure on total effort in the fishery were analyzed in 4.1. The results indicate that 25 DAS/Trips provision would reduce the cod landings in this area by 3.5 percent. If the landings of the other species declined in the same proportion, this measure would reduce the total fleet revenues by only \$95,295 from the 1997 levels (Table 67).

<b>Geartype</b>	<b>Total revenues during May-February (in dollars)</b>	<b>Reduction in revenues column 1 X 3.5% (\$)</b>
<b>Dredge</b>	58,369	- 2,043
<b>Groundfish Gear</b>	2,664,349	- 93,252
<b>Total</b>	2,722,718	- 95,295

**Table 67; Revenue Impacts of Option 4 25 DAS/Trips restriction, February – May, based on 1997 data**

Instead of the 25 DAS/trips restriction proposed under Option 4, Option 3 contains an increase in the cod minimum size to 21 inches. This measure may reduce the revenues of the fishing vessels in the very short-term, and increase their costs due to the costs of discarding or due to any changes in gear in order to reduce the catch of smaller fish. The loss of revenues in the short-term could be recovered, however, later in the fishing year as yield per recruit increases due to the growth in 19-21 inch fish not caught (depending on changes in gear selectivity adopted to reduce bycatch).

#### **4.2.2.2.3 Summary of economic impacts for Options 3 and 4**

- Since these options include smaller area closures compared to Options 1 and 2 and the status quo, the fleet revenues are expected to increase from the status quo levels determined by Frameworks 27 and 31 measures. These options do not meet, however, fishing mortality objectives for Gulf of Maine cod.
- Since Option 4 proposes to close upper part of Stellwagen Bank and Cashes Ledge CA year round, it will reduce the fleet revenues by \$1.2 million (75 percent effort displacement) to \$4.5 million compared to Option 3 levels. In comparison to status quo, however, Option 4 will still have positive impacts on fleet revenues because of the smaller size of closed areas under this option.
- It is not possible to quantify the impacts of the minimum fish size and running clock and 2-day layover day requirement under Option 3. The impacts under Option 4 of the prohibition on party and charter boats from fishing in the GOM closed areas during February through May also cannot be quantified, although this prohibition is expected to have a large negative impact on the revenues of the restricted vessels. The longer closures of areas combined with this prohibition under Option 4 will probably result in larger negative impacts on the fleet compared to Option 3. Again, both options will increase fleet revenues compared to Options 1 and 2 and status quo, but will fail to meet conservation objectives for Gulf of Maine cod.

#### **4.2.2.3 Requirement for Party/Charter Vessels to Obtain an Exemption Certificate to Fish in the Gulf of Maine Closed Areas**

Under the proposed Framework 33 measures, a certification program for all vessels carrying passengers for hire in any or all of the Gulf of Maine closed areas would be implemented. Any vessel enrolling in the proposed certification program would be subject to the recreational no-sale

provision and would be prohibited from using any Multispecies DAS for the duration of the certificate. The Council considered three options for the duration of the certificate: full year, 6-months, or 3-months. The following provides a summary of the recreational party/charter fishery in the Northeast region and evaluates the potential economic impacts for the different certification program alternatives. The Council proposes the three-month certification program.

#### **4.2.2.3.1 Description of Affected Entities**

As proposed, the Framework 33 certification requirement would affect any vessel that chooses to take passengers for hire in any one or all of the Gulf of Maine closure areas regardless of species sought or recreational permit held by the vessel for at least the 2000-2001 multispecies fishing year. Thus, this measure would apply to any vessel holding a federal party/charter permit for any species as well as any limited access multispecies vessel that chooses to carry passengers for hire. Based on 1999 year-to-date (YTD) permit data, there are 3,092 vessels that could be affected by the proposed measure. Of these vessels, all but 76 held at least some kind of limited access or open access multispecies commercial permit and/or an open access multispecies party/charter permit.

The economic activity of taking passengers for hire is classified under the Standard Industrial Code (SIC) code 7999 (Miscellaneous Amusement and Recreation Services), while the economic activity of commercial fishing is classified under SIC code 0912. For purposes of size classification under the Regulatory Flexibility Act, the Small Business Administration defines any entity in SIC code 7999 and 0912 as “small” if gross sales do not exceed \$5 and \$3 million respectively. Based on these size standards, all of the potentially affected entities are considered “small.”

Although there are over three thousand vessels that could be required to enroll in the certification program, the proposal would only affect a vessel if recreational passengers are actually taken *and* if the vessel chooses to operate in the Gulf of Maine closed areas. Existing data does not present fine enough resolution to determine patterns of party/charter activity that correspond to the precise coordinates of the Gulf of Maine time and area closures. Nevertheless, the number of vessels that reported at least one party/charter trip within the boundaries of the Gulf of Maine provides a conservative estimate of the number of participating vessels that are most likely to be affected by the certification requirement. Based on 1998 logbook records, a total of 101 vessels took at least one or more party/charter trips in the Gulf of Maine. The economic assessment reported below is based on the potential impact that the certification requirement would have on these 101 vessels. These 101 vessels are herein referred to as “participating vessels.”

#### **4.2.2.3.2 Description of Participating Vessels**

Based on permit application year 1998 data, the 101 participating vessels possessed a total of 201 party/charter permits and 160 commercial permits covered by the Multispecies, Lobster, Summer Flounder, Scup, Black Sea Bass, and Squid/Mackerel/Butterfish FMPs (Table 68). Nearly half of the participating vessels held an open access multispecies party/charter permit (50), while the

remaining vessels held either a limited access multispecies permit (29) or some combination of open access multispecies permits (46 hand gear and 8 non-regulated multispecies).

<b>FISHERY MANAGEMENT PLAN</b>	<b>PARTY/CHARTER PERMITS</b>	<b>COMMERCIAL PERMITS</b>
<b>Multispecies</b>	50	
Limited Access		29
Hand Gear Only		46
Non-regulated		8
Lobster	3	15
Summer Flounder	41	4
Squid/Mackerel/Butterfish	54	40
Scup	33	3
Black Sea Bass	20	4
<b>Total Party/Charter Permits = 201</b>		<b>Total Commercial Permits = 160</b>

**Table 68 Summary of Federal Permits Held by Participating Gulf of Maine Party/Charter Vessels**

In 1998, the majority of participating vessels (54) operated out of primary ports in the state of Massachusetts (Table 69). Many of these vessels were clustered in Gloucester (12), Green Harbor (10), Newburyport (4), Plymouth (3), Salisbury (7), and Scituate (4). There were 20 participating vessels operating out of ports in the state of Maine, but Portland was the only port with three or more participating vessels (Table 70). New Hampshire's party/charter vessels (14) were clustered in the ports of Hampton (6) and Portsmouth (4). The remaining participating vessels in 1998 were broadly distributed across 36 different ports in the Northeast region.

STATE	NUMBER OF VESSELS
Massachusetts	54
Maine	20
New Hampshire	14
New York	5
Other States	8

**Table 69 Summary of Participating Gulf of Maine Party/Charter Vessels by Primary Port State**

PORT	NUMBER OF VESSELS
Gloucester, MA	12
Green Harbor, MA	10
Hampton, NH	6
Newburyport, MA	4
Plymouth, MA	3
Portland, ME	3
Portsmouth, NH	3
Salisbury, MA	7
Scituate, MA	4
Other Ports <sup>1</sup>	49

<sup>1</sup> Includes 36 ports in the Northeast region.

**Table 70 Summary of Primary Port for Participating Gulf of Maine Party/Charter Vessels**

The participating vessels in 1998 ranged in size from 20 feet to 78 feet (Table 71). Fifty percent of the vessels were less than 35 feet in overall length, and 75% were less than 47 feet. In terms of gross registered tons (GRT), the vessels ranged from one to 124 GRT. The median vessel in 1998 was 15 GRT, and 95% of the vessels were less than 79 GRT.

<b>PERCENTILE OF DISTRIBUTION</b>	<b>LENGTH (FEET)</b>	<b>GROSS TONS (TONS)</b>
<b>Minimum</b>	20	1
<b>5<sup>th</sup></b>	22	2
<b>25<sup>th</sup></b>	31	8
<b>Median</b>	35	15
<b>75<sup>th</sup></b>	47	29
<b>95<sup>th</sup></b>	77	79
<b>Maximum</b>	78	124

**Table 71 Summary of Participating Gulf of Maine Party/Charter Vessels by Vessel Size**

Based on 1998 reported fishing activity in vessel trip reports and dealer data, the participating vessels operated in the Gulf of Maine as well as areas in Georges Bank and Southern New England. Assuming an average per passenger fee of \$65, the participating vessels earned a total of \$6.5 million in 1998 from combined passenger fees and their commercial fishing activity. These revenues were divided into \$3.9 million for passenger fees on 3,157 trips taken in the Gulf of Maine, \$1.8 million for passenger fees on 1,205 trips taken outside the Gulf of Maine, and \$0.8 million in sales from commercial fishing (Table 72). The total number of fish kept was 243,215 and 169,035 inside and outside the Gulf of Maine respectively. Total discards (in numbers of fish) were estimated at 355,917 and 45,847 inside and outside the Gulf of Maine respectively. Total Gulf of Maine cod kept was 110,775 fish, while 76,537 Gulf of Maine cod were reported to be discarded.

<b>VARIABLE</b>	<b>GULF OF MAINE</b>	<b>NON-GULF OF MAINE</b>
<b>Number of Trips</b>	3,157	1,205
<b>Number of Passengers</b>	60,707	27,056
<b>Passenger Revenue<sup>1,2</sup></b>	3,945,955	1,758,640
<b>Total Fish Kept</b>	243,215	169,035
<b>Total Fish Discarded</b>	355,917	45,847
<b>Total Cod Kept</b>	110,775	12,625
<b>Total Cod Discarded</b>	76,537	1,615
<b>Total Other Groundfish Kept</b>	57,685	861
<b>Total Other Groundfish Discarded</b>	143,998	572
<b>Total Non-Groundfish Species Kept</b>	74,755	155,549
<b>Total Non-Groundfish Species Discarded</b>	135,382	43,660
<p><i>1 Assumed average passenger fees of \$65, based on 1994 survey of party/charter anglers.</i></p> <p><i>2 Total revenues from commercial fishing activities were \$820,280.</i></p>		

**Table 72 Summary of Participating Gulf of Maine Party/Charter Vessel Activity**

The majority of participating vessels earned all of their 1998 income from passenger fees. For 75% of the 101 participating vessels, passenger fees accounted for 98% or more of total revenues (Table 73, Column 1). These vessels are participating in little to no commercial fishing activities. There were 25 vessels whose passenger fees accounted for less than 5% of earnings. The majority of their passenger fee revenues, however, came from trips taken in the Gulf of Maine (Table 73, Column 2). Similarly, for the 76 vessels with 95% or greater earnings from passenger fees, the majority of these revenues came from trips taken in the Gulf of Maine.

	<b>ALL VESSELS</b>	<b>PC REVENUES &lt; 5%</b>	<b>PC REVENUES &gt;= 95%</b>
<b>STATISTICS</b>	<b>PC Revenues/Total Revenues</b>	<b>Gulf of Maine PC Revenues/Total PC Revenues</b>	<b>Gulf of Maine PC Revenues/Total PC Revenues</b>
<b>Mean</b>	0.844	0.882	0.872
<b>Standard Deviation</b>	0.310	0.283	0.291
<b>Minimum</b>	0.002	0.005	0.002
<b>5<sup>th</sup> Percentile</b>	0.028	0.107	0.003
<b>25<sup>th</sup> Percentile</b>	0.977	0.948	0.968
<b>Median</b>	1.00	1.00	1.00
<b>75<sup>th</sup> Percentile</b>	1.00	1.00	1.00
<b>95<sup>th</sup> Percentile</b>	1.00	1.00	1.00
<b>Maximum</b>	1.00	1.00	1.00
<b>N</b>	101	25	76

**Table 73 Summary of Gulf of Maine Party/Charter Vessel Distribution of Party/Charter Revenues**

#### **4.2.2.3.3 Economic Impacts of Proposed Certification Alternatives**

As previously discussed, existing data do not permit sufficient resolution to model exact times and areas that coincide with Gulf of Maine closures. Further, the proposed certification requirement would apply to any closures that may be implemented either through a subsequent framework adjustment or emergency action. Therefore, the impacts of the certification measure were developed under the assumption that the certificate would be required of any party/charter vessel that fished anywhere in the Gulf of Maine for the duration of the certificate. This assumption is considered a worst-case scenario, so the estimated impacts are likely to overstate the potential economic impacts of the certification program. Nevertheless, the resulting estimates will provide a valid basis for purposes of comparing impacts of alternative certificate duration periods.

The analysis was conducted by compiling monthly commercial activity from dealer data and monthly party/charter activity from vessel logbook data for each of the 101 participating vessels in

1998. The party/charter data was further subdivided into Gulf of Maine and Non-Gulf of Maine activity. An average passenger fee of \$65 was used to calculate passenger income. Since the proposed certification program would only affect party/charter activity in the Gulf of Maine, each participating vessel was assumed to choose between: (1) obtaining the certificate and dropping any commercial activity during the duration of the certificate; and (2) not obtaining the certificate. In the latter case, the vessel would be able to continue to take passengers for hire outside the Gulf of Maine (closed areas) and would be able to engage in commercial fishing activity. The vessel was assumed to choose the alternative that yields highest gross revenues. For example, a vessel earning \$45 thousand from party/charter activity in the Gulf of Maine and \$5 thousand in commercial fishing activity was assumed to obtain the certificate and give up the commercial fishing activity.

Eight different certification duration periods were evaluated. In addition to a one-year duration, two 6-month, and five 3-month duration periods were evaluated. The number of impacted vessels (vessels with 5% or greater loss in gross revenues) ranged from a high of 17 for the one-year certification to one vessel for a April-June certification period (Table 74). The difference in the number of impacted vessels across certification alternatives is due to differences in fishing patterns (fishing location and mix of party/charter *vis à vis* commercial fishing among the participating vessels). These differences affect which vessels choose to fish under a certification program and which vessels choose to exit the party/charter fishery for the duration of the certification time period.

	1998	Annual Certification	April-September Certification	May-October Certification	April-June Certification	May-July Certification	June-August Certification	July-September Certification	August-October Certification
Vessels with 5% or Greater Reduction in Combined Commercial and Party/Charter Revenues	N/A	17	15	13	1	7	9	12	10
Commercial Fishing Revenue (\$)	820,280	780,996	779,339	781,301	812,386	801,664	806,451	811,255	803,017
No. of Gulf of Maine Passengers	60,707	59,184	60,258	60,284	60,616	60,530	60,461	60,338	60,524
Gulf of Maine Passenger Revenue	3,945,955	3,846,960	3,916,770	3,918,460	3,940,040	3,934,450	3,929,965	3,921,970	3,934,060
Gulf of Maine Cod Kept (No. of fish)	110,775	103,763	106,249	107,666	106,967	108,129	110,174	110,178	110,384
Gulf of Maine Cod Discarded (No. of fish)	76,537	74,939	75,942	76,034	76,452	76,342	76,350	76,077	76,212
Gulf of Maine Other Groundfish Kept	57,685	56,073	56,809	56,870	57,430	57,106	57,252	57,103	57,490
Gulf of Maine Other Groundfish Discarded	143,998	143,527	143,806	143,817	143,985	143,948	143,923	143,866	143,881
Gulf of Maine Non-Groundfish Kept	74,755	71,016	71,260	71,262	74,724	71,944	72,010	71,231	73,898
Gulf of Maine Non-Groundfish Discarded	135,382	134,350	134,366	134,362	135,377	135,124	134,593	134,498	135,215

**Table 74 Summary of Impacts of Gulf of Maine Party/Charter Certification Alternatives. Shaded cells are proposed three-month programs.**

Under a one-year certification program, 17 of the 101 participating vessels in 1998 are estimated to lose 5% or more of their 1998 gross revenues. Of the 84 vessels that would not be impacted by less than 5% revenue loss, 75 would likely choose to fish under the certification program, while 9 would choose to give up party/charter fishing in the Gulf of Maine (Table 75).

Commercial fishing revenues for the 75 vessels that would choose to obtain an exemption accounted for only a small proportion (less than 5%) of annual gross revenues. Passenger fees from Gulf of Maine party/charter trips for the 9 vessels that would give up party/charter fishing accounted for less than 5% of their gross annual revenues. By contrast, the 17 impacted vessels were more diversified in their mix of commercial and party/charter fishing activities and would be required to give up a proportion of their gross revenues. Revenue loss for these vessels ranged from a high of 47% to a low of 6% (Table 75). Fifty-percent of the 17 potentially impacted vessels would give up 29% of their annual gross revenues under the alternative for a one-year certification program.

	Annual Certification	April-September Certification	May-October Certification	April-June Certification	May-July Certification	June-August Certification	July-September Certification	August-October Certification
No. of Impacted Vessels That Obtain Certificate	7	7	7	0	4	4	3	4
Number of Impacted Vessels That do not Obtain Certificate	10	8	6	1	3	5	9	6
Number of non-Impacted Vessels that Obtain Certificate	75	73	73	84	76	70	58	54
Number of non-Impacted Vessels that do not Obtain Certificate	9	13	15	16	18	22	31	37
Maximum Impact	0.47	0.47	0.47	NA	0.41	0.28	0.37	0.35
Median Impact	0.29	0.28	0.27	NA	0.16	0.20	0.18	0.16
Minimum Impact	0.06	0.06	0.10	NA	0.11	0.09	0.08	0.08

**Table 75 Estimated Enrollment in Certification Program and Revenue Impacts for Participating Gulf of Maine Party/Charter Vessels. Shaded cells are proposed three-month programs.**

#### **4.2.2.3.4 Summary**

Of the certification time periods considered in this analysis, the 3-month certification period from April-June has the least economic impact on vessels participating in the party/charter fishery in the Gulf of Maine. Under this three-month alternative, only one vessel would lose more than 5% of its annual income. Further, the loss for the one vessel was estimated to be less than 7%. At worst, the number of impacted vessels would be 17 under the one-year certification period alternative. It is likely that the number of impacted vessels under any of the alternatives analyzed above would be even lower than predicted. The analysis was conducted under the assumption that the certification would be in effect for the entire Gulf of Maine when, in fact, it would only apply to the specified closure areas. Vessels that do not fish in any of the present or proposed closure areas would not be required to enroll in the certification program and would not, therefore, be affected. Even if a vessel currently carries passengers and fishes within the Gulf of Maine closure areas, the vessel will still have the option to fish elsewhere (and not obtain the certificate) without giving up the opportunity to engage in commercial fishing.

#### **4.2.2.4 Impacts of Option 4 February – May Prohibition on Party/Charter Fishing in Gulf of Maine Closed Areas**

GOM Option 4 (not adopted) includes a provision that party/charter vessels would be prohibited from fishing in Closed Areas I and III (as defined in Option 4) from February through May inclusive. This option is independent of the options for a party/charter exemption certificate and was analyzed separately.

Similar to the other party/charter analysis, the number of vessels that reported at least one party/charter trip in the Gulf of Maine during 1998 was used as a baseline and provides a conservative estimate of the number of participating vessels that are most likely to be affected by the prohibition to fish in the closed areas. Based on 1998 logbooks, a total of 101 vessels took at least one or more party/charter trips in the Gulf of Maine. Information about these 101 vessels is presented in the previous section, including permits that these vessels have as well as their primary state and port of operation.

For the purpose of analysis, and to provide a worst-case scenario, these 101 vessels were assumed to have no other options for party/charter trips during the time when they are prohibited from fishing in the proposed closed areas. Since existing data do not present fine enough resolution to determine if observed party/charter activity occurred inside or outside of closed areas, and since the closed areas in Option 4 are different than current closures, larger statistical areas were chosen for the analysis. Statistical Areas 513 and 514 contain the proposed area closures as well as additional areas that would not be closed to party/charter fishing. For the analysis, if a party/charter vessel reported a trip in either Area 513 or 514 during February – May 1998, that trip would no longer occur, and all revenues from that trip are counted as a loss. The results, therefore, overestimate the potential impact of prohibiting party/charter vessels from the proposed closures, as some of the observed trips are likely to have occurred inside the larger statistical areas but outside the areas proposed for closure.

Table 76 summarizes the potential impacts of this provision on the 101 vessels that made at least one party/charter trip in the Gulf of Maine during 1998. According to Table 76, 64 of the 101

vessels are projected to lose 5% or more of their combined commercial and party/charter revenues in 1998 from this provision. While commercial fishing revenues stay the same, revenues from passenger fees are expected to decline 19.8% because the number of Gulf of Maine party/charter passengers declines by 19.8%. As a result, the expected catch (landings and discards) of Gulf of Maine cod declines 36.5%. The catch of other groundfish species is projected to decline 7.8%.

	<b>Baseline (1998)</b>	<b>Option 4</b>
<b>No. Vessels with 5% or Greater Reduction in Combined Commercial and Party/Charter Revenues</b>	NA	64
<b>Commercial Fishing Revenue (\$)</b>	820,280	820,280
<b>No. of Gulf of Maine Passengers</b>	60,707	48,709
<b>Gulf of Maine Passenger Revenue (\$)</b>	3,945,955	3,166,085
<b>No. of Gulf of Maine Cod Kept</b>	110,775	68,460
<b>No. of Gulf of Maine Cod Discarded</b>	76,537	50,437
<b>No. of Gulf of Maine Other Groundfish Kept</b>	57,685	48,673
<b>No. of Gulf of Maine Other Groundfish Discarded</b>	143,998	137,312
<b>No. of Gulf of Maine Non-Groundfish Kept</b>	74,755	59,964
<b>No. of Gulf of Maine Non-Groundfish Discarded</b>	135,382	131,342

**Table 76 Summary of Impacts of Gulf of Maine Party/Charter Certification Alternatives**

Table 77 presents the distribution of potential impacts of this option on the 64 Gulf of Maine party/charter vessels that are projected to lose 5% or more of their 1998 revenues under this option. Five of the 64 affected vessels are projected to lose 100% of their revenues under this option. This is because in 1998, these five vessels made 100% of their revenues from fishing during February – May entirely within statistical areas 513 and 514. It is likely that at least some portion of their 1998 revenues came from trips within these statistical areas but outside of the areas proposed for closure. However, the details on their party/charter fishing patterns in 1998 are unknown. The analysis, therefore, should be interpreted as a worst-case scenario (i.e., under the assumption that all of their activity *did* occur within the areas proposed for closure). Two vessels are projected to lose 75% or more of their revenues under this option, and 9 are projected to lose 42% or more of their revenues. The median impact is a loss of 23% of the 1998 revenues; 16 vessels fall into this category.

	<b>Option 4 Percent Revenue Reduction</b>	<b>No. of Participating Vessels</b>
<b>Maximum Impact</b>	100%	5
<b>95<sup>th</sup> Percentile</b>	75%	2
<b>75<sup>th</sup> Percentile</b>	42%	9
<b>50<sup>th</sup> Percentile (Median)</b>	23%	16
<b>25<sup>th</sup> Percentile</b>	11%	16
<b>5<sup>th</sup> Percentile</b>	8%	16

**Table 77 Distribution of Estimated Impacts for Participating Gulf of Maine Party/Charter Vessels**

### 4.2.3 Impact of Georges Bank cod measures

The Council considered five area closure options in addition to the status quo GB cod trip limit of 2,000 pounds per day to achieve the plan objectives for this stock. It is proposing Option 5. These measures will impact cod landings and revenues, and also indirectly affect the landings and revenues of other species depending on the degree of effort displacement and revenue recovery from other areas and species. The impacts of these measures on fleet revenues --compared to the expected levels under the existing system -- are examined in this section.

#### Summary of results

Alternatives	No effort Displacement (Scenario A)		Total Displacement (Scenario B)		
	Revenue reduction (\$ million)	Percent Change in revenue	Revenue reduction (\$ million)	Percent Change in revenue	Revenue loss per metric ton of cod saved (\$/mt)
<b>OPTION 1</b>					
Total including dredges	-16.2	-9.9%	-1.5	-0.9%	1,457
Total without dredges*	-10.7	-9.7%	-0.9	-0.8%	990
<b>OPTION 2</b>					
Total including dredges	-38.9	-23.7%	-13.9	-8.5%	12,186
Total without dredges*	-25.9	-23.3%	-10.9	-9.8%	11,192
<b>OPTION 3</b>					
Total including dredges	-31.9	-19.4%	-2.0	-1.2%	3,291
Total without dredges*	-21.9	-19.7%	-1.3	-1.2%	2,550
<b>OPTION 4</b>					
Total including dredges	-9.4	-5.7%	-0.3	-0.2%	484
Total without dredges*	-6.7	-6.0%	-0.3	-0.3%	568
<b>OPTION 5</b>					
Total including dredges	-6.5	-3.9%	-0.9	-0.6%	1,898
Total without dredges*	-4.1	-3.7%	-0.3	-0.3%	784

\* Percentage change shows the change in fishing revenues of trawl, gillnet and hook gear.

**Table 78: Estimated revenue impacts from Georges Bank closures. The Council proposes Option 5, with an exemption for scallop dredges.**

- The proposed area closures will have negative impacts on fleet revenues and on net economic benefits in the short-run. Table 78 shows the impacts under two scenarios for effort displacement. The “no effort displacement” scenario (A) shows the maximum revenue impacts and the “total effort displacement” scenario shows the minimum revenue impacts for each area closure option.
- The largest reduction in revenues are estimated to occur with “no effort displacement”, that is, if the vessels are not able to recover some part of their revenues by fishing in open areas (See also Table 80, Scenario A). Among the five proposed alternatives, Option 2 is estimated to have the largest negative impacts by a \$38.9 million loss, or 23.7% reduction, in fishing revenues, whereas Option 5 would reduce the fleet revenues by \$6.5 million, or by 3.9%, including the revenues of the dredge sector from the levels estimated under Framework 27 measures.
- The revenue losses will be less, for example, \$13.9 million for Option 2, and only \$0.3 million for Option 4, if the vessels were able to shift their effort fully to open areas, generate revenues per DAS at the average rate of vessels that used the same gear in the open areas. (Table 78, Scenario B).
- It is highly unlikely, however, that vessels will recover all of the projected revenue loss from the closed areas by fishing in the open areas. Factors such as the size and horse power of some vessels or individual fishermen’s choice, ability or local knowledge may limit their ability to fish farther off-shore or in other areas, so that not all effort can realistically shift to open areas. As a result, the actual impacts on revenues will lie somewhere between the range of impacts estimated for the “no effort displacement” and “total effort displacement” scenarios (See scenarios B and C in Table 80 below).

Alternatives	Estimated cod landings (metric tons)		Reduction in cod landings (metric tons)	
	No trip Limit	2000 pounds trip limit	No trip Limit	2000 pounds trip limit
<b>Option 1</b>	4,400	3,746	-1,032	-879
<b>Option 2</b>	4,292	3,654	-1,141	-971
<b>Option 3</b>	4,835	4,116	-598	-509
<b>Option 4</b>	4,835	4,116	-598	-509
<b>Option 5</b>	4,944	4,209	-489	-416

**Table 79 Estimated cod landings (metric tons)**

- The results in Table 78 suggest that the Option 2 has the highest cost in terms of revenues lost per metric ton of cod saved, followed by Options 3 and 5, if the dredges are not allowed to fish in the closed areas. Out of these alternatives, Option 3 has a large economic cost compared to Option 4, despite the same amount of cod saved under these options, i.e., 509 metric tons with a trip limit of 2,000 pounds/day. Option 4 has also the lowest revenue loss per metric ton of cod saved.

- Option 2 has a high marginal cost compared to Option 1. Cod landings under Option 2 is only 92 metric tons lower than the landings under Option 1, while the revenue loss under Option 2 exceeds the revenue loss for Option 1 by more than \$12 million with total effort displacement.
- These results are somewhat misleading, however, because the model considers revenues from all species caught by vessels that would be excluded, including some high value species such as tuna. Since pelagic hook gear is exempt from the closure, those revenues would actually not be lost. The affected vessels, while prohibited from fishing for or landing cod caught in the closed areas, could continue their tuna fishing with the result that the revenues lost would be significantly less than the model results indicate.

#### Assumptions and methodology

- The economic impacts are examined subject to availability of data, and relative to taking no action to modify the current measures. The status quo trip limit is 2,000 pounds per day.
- The potential impacts are estimated using the information on landings, revenues, and effort in 1997 in the proposed closure areas under the various assumptions regarding effort displacement:
  1. No effort displacement (Scenario A)
  2. Partial effort displacement
    - at the same catch per unit effort (Scenario C)
    - at a reduced catch per unit effort (Scenario B)
  3. Total effort displacement (Scenario D)
- The no-displacement model (Scenario A) assumes that the vessels do not fish in other areas and/or increase their fishing effort in the closure areas in other months so that the revenues and landings from a closed block-month are lost and can not be recovered from other areas.
- The scenarios with partial effort displacement, Scenarios B and C, provide some examples of the likely impacts if only 50 percent of the effort from the closed areas was directed to the open areas. The impacts are examined separately for each type of gear in Table 80.
- For partial effort-displacement scenarios, the revenue recovered from the open areas was estimated by multiplying the displaced effort (total DAS in the closed areas (by gear type) with the average revenue per DAS (by gear type). In this way, the effort displacement model takes into account the differences in DAS used and the revenue-per-day between trawl, dredge, hook or gillnet vessels, and vice versa. Average revenue per DAS was reduced by 50 percent for scenario B, and assumed to be constant for scenario C.
- Sometimes, due to the higher revenue per DAS in the open areas, effort displacement results in an increase in revenues as areas are closed. However, this is probably not a realistic result. If the vessels were able to fish in open areas and could obtain higher revenues per DAS, they would likely do so even under status quo conditions. Even if all vessels could displace their effort to the open areas, it would be unrealistic to assume that they could derive the same level of revenues per DAS in the open areas as those vessels already fishing in those areas. For these reasons, the maximum increase in revenues with effort displacement compared to the status quo levels is set to zero.

#### 4.2.3.1.1 Impacts of Area closures on fleet revenues

The impacts of area closures on total revenues are shown by gear type in Table 80 for Options 1 through 5. It should be emphasized these impacts show the net change, or incremental impacts, compared to the status quo option which assumes the continuation of the current, year-round area closures.

The assumption of no effort displacement, or Scenario-A, shows the maximum loss in revenues from the proposed closures. If the vessels are not able to recover their losses by shifting effort to other times or areas, the decline in total revenues, including those of the dredge sector, would be highest for Option 2 (\$38.9 million) followed by Option 3 (\$31.9 million), and Option 1 (\$16.2 million). Since Option 4 and Option 5 include smaller closure areas, they will reduce fleet revenues less, by \$7.1 million and by \$5.1 million, respectively. Under almost all area closure options with no effort displacement, the relative revenue impacts are similar in terms of gear type, all having largest impacts on trawl fleet in absolute value, followed by dredges, gillnets and hook gear. Option 2 is an exception, however, resulting in larger negative for the hook fishery compared to the gillnet fishery.

The impacts on net revenues (i.e., revenues minus costs), however, will be less than these levels since the operating costs will also decline as effort is reduced by the closures under the no effort-displacement scenario.

If all the vessels could shift all of their effort to open areas, and if their landings and average revenues per DAS remained the same prior to the closures (Scenario-D in Table 1), then the proposed closures would have less impact on their revenues. Even with total effort displacement, however, the impacts on revenues are negative, ranging from a \$0.3 million loss for option 4 to \$13.9 million loss for option 2, including the revenue loss to dredges.

It is highly unlikely, however, that vessels will recover all of the revenue loss from the closed areas by fishing in the open areas. In some cases, the size and horsepower of some vessels may restrict their ability to fish in distant off-shore areas, so that not all effort can actually shift to open areas. In addition, the crowding-out impacts of many vessels fishing in the open areas, and the depletion of the fishery resources would reduce the catch per unit effort from these areas. Individual fishermen's preferences, abilities and local knowledge will also reduce the effectiveness or impact of displaced effort.

A more realistic scenario with the effort displacement is to assume that the vessels may be able to shift their effort to other areas/periods only partially. Table 80 provides a range of impacts assuming that only 50 percent of the displaced effort may shift to other areas/times. Scenario-B, shows the impacts of proposed closures on the revenues from all species assuming extra effort can generate only half as much revenue per DAS, and scenario-C shows the impacts assuming that the revenue per DAS stays constant at the level prior to the closures.

Scenario-B, probably portrays a more realistic outcome in terms of the impacts of the proposed closures compared to the 'no effort displacement' and 'total effort displacement' scenarios. Under this scenario, the largest revenue loss for the fleet as a whole is estimated to occur under Option 2 closures (\$32.6 million revenue loss), and the smallest loss under Option 5 (\$5 million) including

the loss to the dredges. Scenario-C, on the other hand, represents a more optimistic case with an even smaller reduction in revenues since vessels can recover at least half of their revenue losses from closed areas by fishing in the open areas.

These results should be interpreted with caution for the following reasons:

- Ex-vessel prices of fish are assumed to stay constant after the closures. If ex-vessel prices increase as a result of reduced landings from closures, the revenue loss will be less than estimated in Table 1.
- The variable cost savings associated with the reduced effort are not taken into account. If the effort displacement is only partial, the variable costs of vessels will decline. As a result, the decline in revenues net of variable costs will be less than shown in Table 1.

	(A) No Displacement		(B) 50% Displacement at 50% of RPUE*		(C) 50% Displacement at the same of RPUE*		(D) Total Displacement	
	Revenue Reduction \$ million	% Decrease	Revenue Reduction \$ million	% Decrease	Revenue Reduction \$ million	% Decrease	Revenue Reduction \$ million	% Decrease
<b>Option 1</b>								
dredge	-5.5	-10.4	-4.3	-8.1	-3.1	-5.8	-0.6	-1.2
gillnet	-1.5	-20.8	-1.3	-17.9	-1.1	-15.0	-0.7	-9.1
hook	-1.4	-15.5	-1.1	-11.6	-0.7	-7.8	0	-0.2
trawl	-7.8	-8.2	-5.9	-6.2	-4	-4.2	-0.2	-0.2
<b>Total including dredges</b>	<b>-16.2</b>	<b>-9.9</b>	<b>-12.6</b>	<b>-7.6</b>	<b>-8.9</b>	<b>-5.4</b>	<b>-1.3</b>	<b>-0.9</b>
<b>Total without dredges</b>	<b>-10.7</b>	<b>-9.7</b>	<b>-8.3</b>	<b>-7.4</b>	<b>-5.8</b>	<b>-5.2</b>	<b>-0.7</b>	<b>-0.8</b>
<b>Option 2</b>								
dredge	-13	-24.4	-10.5	-19.7	-8	-15.1	-3	-5.7
gillnet	-3.6	-49.9	-3.4	-46.2	-3.1	-42.4	-2.6	-35.0
hook	-5.6	-60.6	-4.8	-51.9	-4	-43.3	-2.4	-26.0
trawl	-16.6	-17.6	-13.9	-14.8	-11.3	-11.9	-5.9	-6.3
<b>Total including dredges</b>	<b>-38.9</b>	<b>-23.7</b>	<b>-32.6</b>	<b>-19.9</b>	<b>-26.4</b>	<b>-16.1</b>	<b>-13.9</b>	<b>-8.5</b>
<b>Total without dredges</b>	<b>-25.9</b>	<b>-23.3</b>	<b>-22.1</b>	<b>-19.9</b>	<b>-18.4</b>	<b>-16.6</b>	<b>-10.9</b>	<b>-9.8</b>
<b>Option 3</b>								
dredge	-10	-18.9	-7.7	-14.5	-5.4	-10.1	-0.7	-1.3
gillnet	-2.2	-30.0	-1.9	-25.4	-1.5	-20.9	-0.9	-11.7
hook	-2.4	-25.6	-1.9	-20.4	-1.4	-15.2	-0.4	-4.7
trawl	-17.3	-18.3	-12.1	-12.8	-6.8	-7.2	0	0.0
<b>Total including dredges</b>	<b>-31.9</b>	<b>-19.4</b>	<b>-23.5</b>	<b>-14.3</b>	<b>-15.1</b>	<b>-9.2</b>	<b>-2</b>	<b>-1.2</b>
<b>Total without dredges</b>	<b>-21.9</b>	<b>-19.7</b>	<b>-15.8</b>	<b>-14.2</b>	<b>-9.8</b>	<b>-8.8</b>	<b>-1.3</b>	<b>-1.2</b>
<b>Option 4</b>								
dredge	-2.7	-5.0	-2	-3.8	-1.3	-2.5	0	0.0
gillnet	-0.9	-12.1	-0.7	-10.1	-0.6	-8.0	-0.3	-4.0
hook	-0.8	-8.3	-0.6	-6.1	-0.4	-3.9	0	0.0
trawl	-5	-5.3	-3.8	-4.0	-2.5	-2.6	0	0.0
<b>Total including dredges</b>	<b>-9.4</b>	<b>-5.7</b>	<b>-7.1</b>	<b>-4.3</b>	<b>-4.7</b>	<b>-2.9</b>	<b>-0.3</b>	<b>-0.2</b>
<b>Total without dredges</b>	<b>-6.7</b>	<b>-6.0</b>	<b>-5.1</b>	<b>-4.6</b>	<b>-3.4</b>	<b>-3.1</b>	<b>-0.3</b>	<b>-0.3</b>
<b>Option 5</b>								
dredge	-2.4	-4.4	-1.9	-3.6	-1.5	-2.8	-0.6	-1.1
gillnet	-0.7	-8.9	-0.6	-7.8	-0.5	-6.7	-0.3	-4.5
hook	-0.2	-2.3	-0.1	-1.6	-0.1	-0.8	0	0.0
trawl	-3.2	-3.4	-2.3	-2.5	-1.4	-1.5	0	0.0
<b>Total including dredges</b>	<b>-6.5</b>	<b>-3.9</b>	<b>-5</b>	<b>-3.0</b>	<b>-3.5</b>	<b>-2.1</b>	<b>-0.9</b>	<b>-0.6</b>
<b>Total without dredges</b>	<b>-4.1</b>	<b>-3.7</b>	<b>-3</b>	<b>-2.7</b>	<b>-2</b>	<b>-1.8</b>	<b>-0.3</b>	<b>-0.3</b>

\*RPUE=Total revenue per unit effort, i.e., per DAS.

**Table 80. Change in total fleet revenues by gear under the alternatives compared to status quo (in million dollars). The proposed action is Option 5, with scallop dredges exempted.**

Table 81 shows the revenue loss per metric ton of cod saved under each option assuming that the vessels will be able to shift their effort in full to the open areas. The results indicate that Option 2 will have the largest cost in terms of revenue lost per metric ton of cod saved, followed by Option 3.

**Total effort displacement scenario**

Alternatives	Estimated cod landings (metric tons)		Reduction in cod landings (metric tons)		Revenue lost per metric ton of cod saved (\$/mt)	
	No trip Limit	2000 pounds trip limit	No trip Limit	2000 pounds trip limit	Including dredges	Not including dredges
<b>Option 1</b>		3,746	-1,032	-879	1,457	990
<b>Option 2</b>	4,400	3,654	-1,141	-971	12,186	11,192
<b>Option 3</b>	4,292	4,116	-598	-509	3,291	2,550
<b>Option 4</b>	4,835	4,116	-598	-509	484	568
<b>Option 5</b>	4,835	4,209	-489	-416	1,898	784
	4,944					

**Table 81 Cod landings and revenue lost per metric ton of cod saved (dollars/metric ton). Option 5 is the proposed action.**

**4.2.4 Economic impacts of scallop vessel access to Closed Areas I and II and the Nantucket Lightship Closed Area**

The Council has moved these proposals into a combined framework document (Scallop Framework 13 and Multispecies Framework 34). The economic impacts of this program are discussed therein.

**4.2.5 The impacts on vessels, states and ports**

As discussed in the previous sections (Economic impacts), the proposed options including the Gulf of Maine (Option 2) and the Georges Bank (Option 5) cod measures may have a negative impact on vessel revenues because of the area closures and other measures included in these options. These negative impacts represent only short-term losses, however. As stated in FSEIS of Amendment 7, the rebuilding measures will have negative impacts in the short-term, but will increase vessel revenues, profits, crew shares and net benefits over the long-term by increasing the stock size and therefore, landings of the regulated species.

All vessels that possess a limited access or open access multispecies permit will be subject to the proposed measures. However, not all vessels will actually be affected by the measures either because they do not fish in the closed areas, their current activity already complies with the new regulations, or they do not participate in the groundfish fishery even though they possess a permit to do so. The dredge vessels will have an exemption and therefore will not be affected by the

closures proposed by this framework. The economic impacts of the proposed options on vessels can be summarized as follows:

- The proposed Gulf of Maine cod measures (Option 2) include the continuation of the closures contained in Frameworks 27 and 31, and the current trip limit of 400 pounds per days-at-sea. As a result, no change in vessel revenues and costs are expected with these closures and trip limits from the status quo levels for the fishing year 2000.
- The proposed action (Option 2) also extends Western GOM Closed area for one additional year, from May 2001 to April 30, 2002. Since this closure was scheduled to end on April 30, 2001, its extension for the 2001 fishing year will reduce the revenues that could be potentially derived from fishing in this area if the scheduled opening went into effect. It should be emphasized, however, if this area was opened on May 2001, other restrictions on catch and effort would be needed to provide an equivalent cod conservation in order to meet GOM cod fishing mortality objectives.
- In addition, the proposed action would close the Cashes Ledge Closed Area in November and Blocks 124 and 125 in January if 50 percent of the TAC is landed by July 31. These closures would have negative economic impacts on vessels by reducing the revenues from all species derived from these areas.
- Although non-preferred Gulf of Maine alternatives (Options 3 and 4) may have positive impacts on vessel revenues because they include smaller closure areas, these proposals fail to meet the Gulf of Maine cod conservation objectives.
- The proposed Georges Bank cod measures (Option 5) include a May area closure in addition to the status quo trip limit, and will have negative impacts on the total fleet revenues of the vessels that use groundfish gear, that is, otter trawls, gillnets and hook vessels.
- Party and charter vessels would be required to obtain an exemption certificate from NMFS to fish in any of the Gulf of Maine closed areas. A limited access vessel in the exemption program would be prohibited from fishing on a DAS while in possession of the certificate. Under this action, only one vessel would lose more than 5 percent of its annual income, and the loss is estimated to be about 7 percent.
- Limited access vessels would be prohibited from fishing under a DAS while taking passengers for hire. This option would close a perceived “loophole” in the regulations that allows party/charter vessels that possess a limited access permit to fish for regulated species with the lower minimum fish size that applies on commercial vessels, and to sell their catch. Party/charter vessels that do not have limited access permits do not have this option. Although this option may potentially have negative impacts on the revenues, the extent of these impacts could not be assessed quantitatively at this time.
- The proposed increase in the haddock trip limit will not likely have a measurable impact on the fishing mortality rate from the status quo. The proposed action reduces the

potential for discards during the May-September period with a conservation impact approximately equivalent to the status quo. Since discards are reduced, revenues may increase, although the extent of this increase could not be quantified at this time.

- For otter trawl vessels fishing in the revised Large Mesh Permit Category, the reduction in the minimum mesh size from 8 inches to 7 inches may have some positive impacts on revenues by itself. The potential increase revenues is offset by a reduction in the increased DAS allocated to participating vessels fishing in this category, from 36 percent to 25 percent. Vessels participating in this program will also have to incur the cost of purchasing a large-mesh trawl net. However, since this is a voluntary program, presumably vessels will not participate unless it is projected to have a positive net economic impact at the vessel level.

In general, the proposed measures will effect the multispecies vessels participated in the Northeast groundfish fishery including the Gulf of Maine and Georges Bank areas. Table 82 through Table 87 provide information about during the period 1994-1998 by gear and tonnage class:

- In 1998, about 847 otter trawls, 460 gillnet and 289 vessels participated in the Northeast fishery, including the Gulf of Maine and Georges Bank areas.
- More than half of the otter trawls (456 out of 847) were small vessels with a tonnage ranging from 5 to 50 GRT. Another third of the otter trawls consisted of vessels with a tonnage of 50 to 150 GRT. Similarly, most of the gillnet (331 out of 460) and hook vessels (195 out of 289) were small vessels in the 5-50 GRT category (Table 82 through Table 87). As these tables show, average annual revenue per vessel for all gear categories was less than \$3 million.
- For the otter trawls, the average annual revenue per vessel (not adjusted for inflation) increased in 1998 compared to 1997 for all tonnage categories, although this increase was very small for tonnage-1 (<5 GRT) vessels (Table 82). Overall, average revenue per vessel, for all tonnage classes combined, increased from \$189,822 in 1997 to \$208,985 in 1998. Table 83 also shows that average revenue per DAS increased in 1998 from its levels in 1997 for all tonnage groups.
- For tonnage-2 (5-50 GRT) gillnet vessels, there has been an increase in annual average revenue per vessel from approximately \$89,291 in 1997 to \$95,773 in 1998. This group contained the majority of gillnet vessels. The average revenue per vessel in tonnage-1 (<5 GRT) and tonnage-3 (51-150 GRT) groups declined slightly, however. Since the number of vessels in these groups fluctuated significantly, the changes in revenue per vessel is a less reliable indicator of the trends for these tonnage classes (Table 84 and Table 85).
- There has been an increase in annual average revenue per vessel from approximately \$70,531 in 1997 to \$83,781 in 1998 for the tonnage-2 (5-50 GRT) hook vessels. Similarly there has been increase in revenues of vessels in tonnage-1 and tonnage-3 groups. Together these groups comprised the majority (281 of out 289) of the hook vessels. The estimated revenue per days-at-sea also increased from \$784 in 1997 to \$1,022 in 1998 (Table 86 and Table 87).

Some of the affected vessels may have participated only in the Gulf of Maine fishery, and will therefore be impacted by only Gulf of Maine area closures. Based upon calendar year 1997 data there were a total of 601 vessels that were found to have fished within one or more of the rolling closures in the Gulf of Maine Area and/or would be affected by one or more of the proposed trip limits. Probably most of these vessels also participated in the Georges Bank fishery and will also be affected by the closures in that area. The majority of these vessels (434) were less than 50 gross registered tons in size and/or listed a Massachusetts homeport (404) on their 1997 permit application (Table 88). The number of affected vessels by homeport is shown in Table 89.

In terms of the area closures alone, and according to the projections based on 1997 database, there were about 417 otter trawl, gillnets and hook vessels that fished in the closure areas included in Framework 27 including the Western Gulf of Maine (GOM) closed area. This number does not include the number of vessels affected by the cod trip limits instituted by Framework 27. With the new GOM closures proposed by Framework 33, the number of vessels affected by the Gulf of Maine closures increase to 431. Therefore, based on 1997 data, there will be an additional 14 vessels impacted by the new closures in GOM. The total number of vessels that landed Gulf of Maine cod and the landings of GOM cod by gear, vessel size and port are shown in Table 90 and Table 92, respectively.

The information on the number of vessels that could be affected by the Georges Bank measures by gear sector, vessel class (gross tonnage) and port, and their landings is provided in the Table 91 and Table 93, respectively. Some vessels that are included in those tables may have also been included in Table 90 and Table 92, since the same vessels could be active in both Gulf of Maine and the Georges Bank cod fisheries.

Year	Data	Tonnage				
		1. <5 GRT	2. 5-50 GRT	3. 51-150 GRT	4. >150 GRT	All
1994	Number of vessels	31	419	299	94	843
	Annual Revenue per vessel (in dollars)*	25,204	62,942	252,122	600,789	188,627
1995	Number of vessels	40	488	291	90	909
	Annual Revenue per vessel (in dollars)*	23,390	68,534	260,071	573,102	177,822
1996	Number of vessels	44	510	284	96	934
	Annual Revenue per vessel (in dollars)*	26,069	67,060	274,930	590,941	182,182
1997	Number of vessels	31	486	280	102	899
	Annual Revenue per vessel (in dollars)*	23,374	64,310	269,234	620,439	189,822
1998	Number of vessels	35	456	257	99	847
	Annual Revenue per vessel (in dollars)*	23,619	71,997	312,966	635,562	208,985

\*Includes revenues from all trips and all species.

**Table 82.Characteristics and revenues of New England otter trawl vessels by ton class**

Year	Data	Tonnage		
		1. 5-50 GRT	2. 51-150 GRT	3. >150 GRT
1994	DAS (average per vessel)	129	154	136
	Revenue per day absent (Average, \$)	488	1,637	4,418
1995	DAS (average per vessel)	97	126	85
	Revenue per day absent (Average, \$)	707	2,064	6,742
1996	DAS (average per vessel)	108	128	143
	Revenue per day absent (Average, \$)	621	2,148	4,132
1997	DAS (average per vessel)	118	140	178
	Revenue per day absent (Average, \$)	545	1,923	3,486
1998	DAS (average per vessel)	125	129	108
	Revenue per day absent (Average, \$)	576	2,426	5,885

Note: DAS and therefore revenue per DAS is not reported for vessels less than 5 GRT because less than 10 vessels were available on which to base effort estimates.

**Table 83. Activity of New England otter trawl vessels by ton class**

Year	Data	Tonnage			
		1. <5 GRT	2. 5-50 GRT	3. 51-150 GRT	Grand Total
1994	Number of vessels	14	331	22	367
	Annual Revenue per vessel (in dollars)*	19,266	83,021	313,403	94,399
1995	Number of vessels	37	424	27	488
	Annual Revenue per vessel (in dollars)*	34,540	91,779	261,145	96,809
1996	Number of vessels	25	394	53	472
	Annual Revenue per vessel (in dollars)*	43,213	91,132	183,441	98,959
1997	Number of vessels	25	359	45	429
	Annual Revenue per vessel (in dollars)*	27,434	89,291	250,923	102,641
1998	Number of vessels	53	377	30	460
	Annual Revenue per vessel (in dollars)*	23,527	95,773	213,650	95,136

\*Includes revenues from all trips and all species.

**Table 84. Characteristics and revenues of New England gillnet vessels by ton class**

Year	Data	Tonnage		
		1. <5 GRT	2. 5-50 GRT	3. 51-150 GRT
1994	DAS (average per vessel)	43	150	N/A*
	Revenue per day absent (Average, \$)	448	553	3,230
1995	DAS (average per vessel)	24	105	153
	Revenue per day absent (Average, \$)	1,439	874	2,232
1996	DAS (average per vessel)	55	121	165
	Revenue per day absent (Average, \$)	786	753	1,112
1997	DAS (average per vessel)	N/A*	138	N/A*
	Revenue per day absent (Average, \$)	N/A*	647	N/A*
1998	DAS (average per vessel)	N/A*	142	N/A*
	Revenue per day absent (Average, \$)	N/A*	674	N/A*

\* less than 10 vessels were available on which to base effort estimates.

**Table 85. Activity of New England gillnet vessels by ton class**

Year	Data	Tonnage				
		1. <5 GRT	2. 5-50 GRT	3. 51-150 GRT	4. >150 GRT	All
1994	Number of vessels	58	184	61	13	316
	Annual Revenue per vessel (in dollars)*	8,372	74,631	297,469	344,752	116,598
1995	Number of vessels	70	217	59	16	362
	Annual Revenue per vessel (in dollars)*	26,942	76,901	252,119	332,062	107,076
1996	Number of vessels	19	184	58	17	278
	Annual Revenue per vessel (in dollars)*	15,168	78,158	220,330	578,270	134,097
1997	Number of vessels	26	192	52	13	283
	Annual Revenue per vessel (in dollars)*	14,007	70,531	231,043	937,175	134,642
1998	Number of vessels	37	195	49	8	289
	Annual Revenue per vessel (in dollars)*	22,009	83,781	290,782	358,967	118,587

\*Includes revenues from all trips and all species.

**Table 86. Characteristics and revenues of New England hook vessels by ton class**

Year	Data	Tonnage**	
		1. <5 GRT	2. 5-50 GRT
1994	DAS (average per vessel)	32	89
	Revenue per day absent (Average, \$)	262	839
1995	DAS (average per vessel)	12	62
	Revenue per day absent (Average, \$)	2,245	1,240
1996	DAS (average per vessel)	N/A*	57
	Revenue per day absent (Average, \$)	N/A*	1,371
1997	DAS (average per vessel)	N/A*	90
	Revenue per day absent (Average, \$)	N/A*	784
1998	DAS (average per vessel)	N/A*	82
	Revenue per day absent (Average, \$)	N/A*	1,022

\* less than 10 vessels were available on which to base effort estimates.

\*\*DAS and therefore revenue per DAS is not reported for vessels greater than 50 GRT because less than 10 vessels were available on which to base effort estimates.

**Table 87. Activity of New England hook vessels by ton class**

State	Ton Class 1	Ton Class 2	Ton Class 3	Ton Class 4	Total
Massachusetts	15	263	100	26	404
Maine	5	90	15	1	111
New Hampshire	6	32	1	0	39
New York	0	7	5	0	12
Rhode Island	0	4	2	3	9
Other	0	12	9	5	26
Total	26	408	132	35	601

**Table 88. Summary of size and home state for vessels that fished in proposed Gulf of Maine closure areas during calendar year 1997 and the vessels that will be affected by the cod trip limits**

<b>Home Port</b>	<b>Total</b>
Northern Maine	65
	46
New Hampshire	
Northern Mass	304
Central Mass	
Southern Mass	54
	9
Other	
Total	601

**Table 89. The homeport of vessels that fished in proposed Gulf of Maine closure areas during calendar year 1997 and the vessels that will be affected by the cod trip limits**

GEAR SECTOR & VESSEL CLASS	MAINE			NEW HAMPSHIRE	MASSACHUSETTS					RHODE ISLAND			OTHER NORTH EAST	TOTAL		
	Portland	Other	Total		Boston	Gloucester	New Bedford	Other	Total	Pt. Judith	Other	Total		#Vessels*	% of total	
Otter Trawl Sector:																
<51 GRT	33	73	106	36	7	40	1	57	105	0	0	0	1	248	30.02	
51-150 GRT	44	16	60	1	9	35	24	13	81	2	1	3	0	145	17.55	
>150 GRT	8	0	8	0	7	12	4	0	23	0	0	0	0	31	3.75	
<b>SUM</b>	<b>85</b>	<b>89</b>	<b>174</b>	<b>37</b>	<b>23</b>	<b>87</b>	<b>29</b>	<b>70</b>	<b>209</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>424</b>	<b>51.33</b>	
Gillnet Sector:																
<51 GRT	13	14	27	26	0	44	1	42	87	0	0	0	1	141	17.07	
51-150 GRT	1	0	1	1	0	2	0	0	2	0	0	0	0	4	0.48	
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00	
<b>SUM</b>	<b>14</b>	<b>14</b>	<b>28</b>	<b>27</b>	<b>0</b>	<b>46</b>	<b>1</b>	<b>42</b>	<b>89</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>145</b>	<b>17.55</b>	
Hook Sector:																
<51 GRT	6	7	13	1	4	21	1	31	57	0	0	0	0	71	8.60	
51-150 GRT	2	0	2	0	0	0	0	1	1	0	0	0	0	3	0.36	
>150 GRT	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0.12	
<b>SUM</b>	<b>9</b>	<b>7</b>	<b>16</b>	<b>1</b>	<b>4</b>	<b>21</b>	<b>1</b>	<b>32</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>75</b>	<b>9.08</b>	
Other Gears:																
<51 GRT	3	27	30	15	1	44	0	86	131	0	0	0	0	176	21.31	
51-150 GRT	0	1	1	0	0	1	1	2	4	0	0	0	0	5	0.61	
>150 GRT	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0.12	
<b>SUM</b>	<b>3</b>	<b>28</b>	<b>31</b>	<b>15</b>	<b>1</b>	<b>45</b>	<b>2</b>	<b>88</b>	<b>136</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>182</b>	<b>22.03</b>	
Total of All Gear Sectors:																
<51 GRT	55	121	176	78	12	149	3	216	380	0	0	0	2	636	77.00	
51-150 GRT	47	17	64	2	9	38	25	16	88	2	1	3	0	157	19.01	
>150 GRT	9	0	9	0	7	12	5	0	24	0	0	0	0	33	4.00	
<b>SUM</b>	<b>111</b>	<b>138</b>	<b>249</b>	<b>80</b>	<b>28</b>	<b>199</b>	<b>33</b>	<b>232</b>	<b>492</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>826</b>	<b>100.00</b>	

Source: Fishing Vessel Trip Reports

\* This number represents a certain amount of double counting because vessels may land at different ports and use different gears within a fishing year.

The unique count of vessels for all gears was 677 vessels for the 97-98 fishing year.

**Table 90** Number of vessels\*in the Gulf of Maine cod fishery by gear sector and vessel class May 97 - April 98 Fishing Year

GEAR SECTOR & VESSEL CLASS	MAINE			NEW HAMPSHIRE	MASSACHUSETTS					RHODE ISLAND			OTHER NORTH EAST	TOTAL	
	Portland	Other	Total		Boston	Gloucester	New Bedford	Other	Total	Pt. Judith	Other	Total		#Vessels*	% of total
Otter Trawl Sector:															
<51 GRT	3	3	6	1	2	4	2	13	21	15	6	21	26	75	9
51-150 GRT	16	0	16	0	7	12	102	29	150	22	14	36	30	232	28
>150 GRT	10	0	10	0	10	10	31	7	58	9	4	13	2	83	10
<b>SUM</b>	<b>29</b>	<b>3</b>	<b>32</b>	<b>1</b>	<b>19</b>	<b>26</b>	<b>135</b>	<b>49</b>	<b>229</b>	<b>46</b>	<b>24</b>	<b>70</b>	<b>58</b>	<b>390</b>	<b>47</b>
Gillnet Sector:															
<51 GRT	3	2	5	2	0	12	5	34	51	1	10	11	8	77	9
51-150 GRT	0	0	0	0	0	0	1	2	3	0	0	0	0	3	0
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>SUM</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>12</b>	<b>6</b>	<b>36</b>	<b>54</b>	<b>1</b>	<b>10</b>	<b>11</b>	<b>8</b>	<b>80</b>	<b>10</b>
Hook Sector:															
<51 GRT	1	0	1	0	0	1	1	36	38	0	0	0	4	43	5
51-150 GRT	2	1	3	0	0	0	0	1	1	1	0	1	0	5	1
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>SUM</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>37</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>48</b>	<b>6</b>
Other Gears:															
<51 GRT	0	0	0	0	1	1	2	152	156	27	10	37	65	258	31
51-150 GRT	0	1	1	0	0	1	7	2	10	3	4	7	4	22	3
>150 GRT	0	0	0	0	0	0	22	1	23	0	1	1	3	27	3
<b>SUM</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>31</b>	<b>155</b>	<b>189</b>	<b>30</b>	<b>15</b>	<b>45</b>	<b>72</b>	<b>307</b>	<b>37</b>
Total of All Gear Sectors:															
<51 GRT	7	5	12	3	3	18	10	235	266	43	26	69	103	453	55
51-150 GRT	18	2	20	0	7	13	110	34	164	26	18	44	34	262	32
>150 GRT	10	0	10	0	10	10	53	8	81	9	5	14	5	110	13
<b>SUM</b>	<b>35</b>	<b>7</b>	<b>42</b>	<b>3</b>	<b>20</b>	<b>41</b>	<b>173</b>	<b>277</b>	<b>511</b>	<b>78</b>	<b>49</b>	<b>127</b>	<b>142</b>	<b>825</b>	<b>100</b>

Source: Fishing Vessel Trip Reports

\* This number represents a certain amount of double counting because vessels may land at different ports and use different gears within a fishing year. The unique count of vessels for all gears was 707 vessels for the 97-98 fishing year.

**Table 91** Number of vessels\* in the George's Bank cod fishery by gear sector and vessel class May 97 - April 98 Fishing Year

GEAR SECTOR & VESSEL CLASS	MAINE			NEW HAMPSHIRE	MASSACHUSETTS					RHODE ISLAND			OTHER NORTH EAST	TOTAL	
	Portland	Other	Total		Boston	Gloucester	New Bedford	Other	Total	Pt. Judith	Other	Total		1,000 lbs.	% of total
Otter Trawl Sector:															
<51 GRT	250	420	670	533	112	514	1	497	1,124	0	0	0	0	2,327	19.90
51-150 GRT	1,120	98	1,218	15	165	1,299	158	245	1,867	3	2	5	0	3,105	26.56
>150 GRT	282	0	282	0	114	496	68	0	678	0	0	0	0	960	8.21
<b>SUM</b>	<b>1,652</b>	<b>518</b>	<b>2,170</b>	<b>548</b>	<b>391</b>	<b>2,309</b>	<b>227</b>	<b>742</b>	<b>3,669</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>6,392</b>	<b>54.67</b>
Gillnet Sector:															
<51 GRT	341	404	745	1,379	0	1,295	0	431	1,726	0	0	0	2	3,852	32.95
51-150 GRT	71	0	71	124	0	216	0	0	216	0	0	0	0	411	3.52
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
<b>SUM</b>	<b>412</b>	<b>404</b>	<b>816</b>	<b>1,503</b>	<b>0</b>	<b>1,511</b>	<b>0</b>	<b>431</b>	<b>1,942</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4,263</b>	<b>36.46</b>
Hook Sector:															
<51 GRT	22	3	25	9	16	362	0	253	631	0	0	0	0	665	5.69
51-150 GRT	27	0	27	0	0	0	0	0	0	0	0	0	0	27	0.23
>150 GRT	39	0	39	0	0	0	0	0	0	0	0	0	0	39	0.33
<b>SUM</b>	<b>88</b>	<b>3</b>	<b>91</b>	<b>9</b>	<b>16</b>	<b>362</b>	<b>0</b>	<b>253</b>	<b>631</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>731</b>	<b>6.25</b>
Other Gears:															
<51 GRT	0	19	19	9	0	95	0	150	245	0	0	0	0	273	2.34
51-150 GRT	0	5	5	0	0	26	0	1	27	0	0	0	0	32	0.27
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
<b>SUM</b>	<b>0</b>	<b>24</b>	<b>24</b>	<b>9</b>	<b>0</b>	<b>121</b>	<b>0</b>	<b>151</b>	<b>272</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>305</b>	<b>2.61</b>
Total of All Gear Sectors:															
<51 GRT	613	846	1,459	1,930	128	2,266	1	1,331	3,726	0	0	0	2	7,117	60.88
51-150 GRT	1,218	103	1,321	139	165	1,541	158	246	2,110	3	2	5	0	3,575	30.58
>150 GRT	321	0	321	0	114	496	68	0	678	0	0	0	0	999	8.55
<b>SUM</b>	<b>2,152</b>	<b>949</b>	<b>3,101</b>	<b>2,069</b>	<b>407</b>	<b>4,303</b>	<b>227</b>	<b>1,577</b>	<b>6,514</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>2</b>	<b>11,691</b>	<b>100.00</b>

Source: Vessel Trip Reports and Dealer Database

\* Landed Weight

**Table 92** Gulf of Maine cod landings in thousands of lbs.\* by Gear Sector and Vessel Class May 97 - April 98 Fishing Year

GEAR SECTOR & VESSEL CLASS	MAINE			NEW HAMPSHIRE	MASSACHUSETTS					RHODE ISLAND			OTHER NORTH EAST	TOTAL	
	Portland	Other	Total		Boston	Gloucester	New Bedford	Other	Total	Pt. Judith	Other	Total		1,000 lbs.	% of total
<b>Otter Trawl Sector:</b>															
<51 GRT	6	3	9	<1	17	2	<1	31	50	12	1	13	3	75	<1
51-150 GRT	206	0	206	0	491	432	3,660	166	4,749	92	175	267	86	5,308	32
>150 GRT	560	0	560	0	1,360	704	1,947	19	4,030	43	40	83	21	4,694	28
<b>SUM</b>	<b>772</b>	<b>3</b>	<b>775</b>	<b>&lt;1</b>	<b>1,868</b>	<b>1,138</b>	<b>5,607</b>	<b>216</b>	<b>8,829</b>	<b>147</b>	<b>216</b>	<b>363</b>	<b>110</b>	<b>10,077</b>	<b>60</b>
<b>Gillnet Sector:</b>															
<51 GRT	78	3	81	3	0	98	1	2,553	2,652	20	30	50	4	2,790	17
51-150 GRT	0	0	0	0	0	0	3	299	302	0	0	0	0	302	2
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>SUM</b>	<b>78</b>	<b>3</b>	<b>81</b>	<b>3</b>	<b>0</b>	<b>98</b>	<b>4</b>	<b>2,852</b>	<b>2,954</b>	<b>20</b>	<b>30</b>	<b>50</b>	<b>4</b>	<b>3,092</b>	<b>18</b>
<b>Hook Sector:</b>															
<51 GRT	<1	0	<1	0	0	247	<1	1,942	2,189	0	0	0	14	2,203	13
51-150 GRT	9	<1	9	0	0	0	0	10	10	<1	0	<1	0	19	<1
>150 GRT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>SUM</b>	<b>9</b>	<b>&lt;1</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>247</b>	<b>&lt;1</b>	<b>1,952</b>	<b>2,199</b>	<b>&lt;1</b>	<b>0</b>	<b>&lt;1</b>	<b>14</b>	<b>2,222</b>	<b>13</b>
<b>Other Gears:</b>															
<51 GRT	0	0	0	0	1	1	2	1,296	1,300	10	1	11	38	1,349	8
51-150 GRT	0	<1	<1	0	0	<1	10	13	23	8	1	9	<1	32	<1
>150 GRT	0	0	0	0	0	0	3	<1	3	0	<1	<1	<1	3	<1
<b>SUM</b>	<b>0</b>	<b>&lt;1</b>	<b>&lt;1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>15</b>	<b>1,309</b>	<b>1,326</b>	<b>18</b>	<b>2</b>	<b>20</b>	<b>38</b>	<b>1,384</b>	<b>8</b>
<b>Total of All Gear Sectors:</b>															
<51 GRT	84	6	90	3	18	348	3	5,822	6,191	42	32	74	59	6,417	38
51-150 GRT	215	<1	215	0	491	432	3,673	488	5,084	100	176	276	86	5,661	34
>150 GRT	560	0	560	0	1,360	704	1,950	19	4,033	43	40	83	21	4,697	28
<b>SUM</b>	<b>859</b>	<b>6</b>	<b>865</b>	<b>3</b>	<b>1,869</b>	<b>1,484</b>	<b>5,626</b>	<b>6,329</b>	<b>15,308</b>	<b>185</b>	<b>248</b>	<b>433</b>	<b>166</b>	<b>16,775</b>	<b>100</b>

Source: Vessel Trip Reports and Dealer Database

1. Landed Weight

2. Vessel Trip Report (VTR) data were used as a sample to prorate NMFS dealer weighout landing data. As VTR data do not include data from some state licensed vessels, small vessel data may be under

represented in the VTR system. As a result, the landings of small vessels may be under estimated.

**Table 93** George's Bank cod landings in thousands of pounds\* by Gear Sector and Vessel Class May 97 - April 98 Fishing Year

#### **4.2.6 Enforcement and administrative costs**

The implementation of the measures proposed by this framework may increase administrative and enforcement costs for the government. These potential costs may arise as follows:

- 1) at-sea enforcement of an additional Georges Bank area closures in May.
- 2) monitoring the landings in near real-time, or projection of landings to trigger closures in Gulf of Maine cod fishery to determine if 50 percent of the TAC is landed by July 31.
- 3) establishment of a certification program for party/charter vessels to obtain an exemption to fish in closed areas and enforcement of the program
- 4) enforcement of prohibition on using days-at-sea when taking passengers for hire.
- 5) administration of the changes to the large mesh permit category, including re-calculation of DAS for vessels exiting the program after one month;

Although these measures may increase the enforcement and administrative burden, they are not expected to change the monetary costs of enforcement for the government to a significant degree since the budgetary allocations for enforcement in NMFS and the Coast Guard do not provide for any increase. Allocation of the existing resources for the administration or enforcement of these measures may, however, result in reduced enforcement of other management actions. In other words, the enforcement and administration of the new measures may reduce the overall efficiency of the affected agencies without an increase in the budgetary allocations for these resources.

Some of the measures listed above will not require at-sea enforcement, but impose Paperwork Reduction Act (PRA) related burdens. The costs associated with these activities are calculated in the PRA materials submitted under separate cover.

### **4.3 Social and community impacts**

#### **4.3.1 Introduction and Background**

This Social Impact Assessment characterizes the magnitude and extent of the social impacts likely to result from the proposed management action as well as from the other alternatives considered by the Council during the development of Framework 33 to the Northeast Multispecies FMP.

The proposed action for Framework 33 is represented by “Gulf of Maine Option 2” and “Georges Bank Option 5” in the following analysis.

##### **4.3.1.1 Introduction**

National Standard 8 of the Magnuson Stevens Fishery Conservation and Management Act 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 the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.*

National Standard 8 requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. “Sustained participation” is interpreted as continued access to the fishery within the constraints of the condition of the resource. The long-term conservation and rebuilding of stocks often require that limits be placed on particular gears and/or the harvest of specific stocks. Thus, National Standard 8 is interpreted to apply only to a consideration of continued overall access to fishery resources and is not a guarantee that fishermen will be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.

When the Council implemented the multispecies stock rebuilding program in Amendment 7, it recognized that the measures required to achieve the plan objectives would have significant social and community impacts. It stated that the breadth and scope of those measures would likely cause social change proportional to the individual or community dependence on the affected stocks. The Council also noted that the social impacts of the management measures are largely related to their economic impacts, and as such would be severely negative in the short-term and positive in the long-term, although some fundamental changes would occur for which a value cannot be assessed.

Some of the expected impacts have already manifested themselves through changes at the vessel and community level. On the positive side, such changes include ways of adding value to landed species through the establishment of display auctions in some of the major groundfish ports and the growth and development of markets for live fish. Communities have also evolved to support the redirection of effort into other fisheries. Negative changes have included a decrease in fishing employment opportunities and a subsequent increasing need to seek new or supplementary employment outside of fishing. Additional changes that have occurred include disruption in work patterns, family lifestyles, and community networks caused by more constraints on fishing seasons, areas, and allowable landings.

A fundamental problem exists, however, in attributing social change to specific factors such as management regulations when communities or other societal groups are constantly evolving in response to numerous external factors, such as market conditions or technology. Certainly, management regulations influence the direction and magnitude of social change, but attribution is difficult with the tools and data available. Attribution is particularly difficult considering the dynamic nature of fishing communities and other social groupings of individuals in the industry, and in comparison to the no-action alternative in the context of a declining or collapsing resource.

As noted in Framework 27, the Council recognized that the measures contained in that framework would result in short-term hardships on the fishermen and communities that depend on fishing for cod, or fishing in the areas that were to be closed. The direct social impacts of the framework action were expected to be proportional to the dependence of each community or vessel class on the cod landings, and on other fisheries affected by the area closures. In recognition of the losses incurred by fishermen due to closures under Frameworks 25, 26, and 27, Congress appropriated \$5 million to NOAA to provide emergency disaster relief. On September 7, 1999, NMFS

published a notice in the *Federal Register* (64 FR 48594, Sept. 7, 1999) detailing the final information concerning criteria for eligibility, limitations and conditions for receiving the disaster relief. On October 5, 1999, Massachusetts Senators Kennedy and Kerry announced that the Agriculture Appropriations Conference report contains \$15 million in funding that will be directed to groundfish fishermen hard hit by recent closures and low trip limits in the Gulf of Maine. The money will be used to fund industry-based research activities and will help offset economic losses due to the restrictions needed to rebuild Gulf of Maine cod.

As has been stated in numerous framework adjustments, subsequent to Amendment 7, the Council realizes that the cost of conservation is borne by the fishermen and communities dependent on the fisheries being restricted. The justification for imposing these costs is the overwhelming long-term economic benefit of a resource base that is rebuilt to and managed at maximum sustainable levels. While some stocks of fish are responding to management measures implemented since Amendments 5 and 7, other stocks are still in need of conservation. Strategies that minimize short-term social impacts may cause long-term impacts to be more significant due to the longer rebuilding times that will result. The social impacts of measures designed to rebuild other multispecies fisheries will be discussed when those measures are identified and analyzed in Amendment 13.

In general, management measures implemented through Framework 33, as with all framework adjustments, are intended to fall within the scope of the rebuilding program initiated by Amendment 7. Therefore, while there may be short-term social impacts resulting from the Framework 33 actions, the long-term social impacts of this framework adjustment are consistent with the Amendment 7 assessment. The long-term social impacts discussed in Amendment 7 will be re-evaluated in Amendment 13. Nevertheless, this social impact discussion attempts to characterize the type and magnitude of short-term social impacts that can be expected from the Framework 33 alternatives. It also characterizes the differences between the expected social impacts under each management alternative in order to provide the Council with information useful in selecting the final management measures to be included in Framework 33.

#### **4.3.1.2 Background**

A description of the affected human environment (multispecies fishermen and fishing communities) as well as an assessment of the social impacts of the multispecies rebuilding program are presented in Amendments 5, 7, and 9. In addition, Frameworks 25, 26, 27, 30, and 31 contain useful information on affected fishing vessels and communities. The information in these documents can supplement this social impact assessment and provide background information to help assess the impacts of management alternatives. This information was used to qualitatively assess the social impacts of the alternatives under consideration for this framework adjustment. No new information about affected ports and communities was available for consideration in this social impact assessment. However, Amendment 13 to the Northeast Multispecies FMP will provide updated social and economic information to comprehensively characterize the socioeconomic baseline from which management actions will be evaluated.

### 4.3.2 Social Impacts of Framework 33 Alternatives

The following sections represent an assessment of the potential social and community impacts of the various alternatives under consideration in Framework 33 to the Multispecies FMP. This analysis compares the expected impacts of each alternative under consideration to both a baseline scenario and the other alternatives under consideration. However, comprehensive, updated information and data were not available to accurately quantify baseline socioeconomic conditions in affected fishing communities and to provide meaningful comparisons based on quantifiable impacts. This assessment, therefore, serves as a qualitative analysis of the type and magnitude of social impacts likely to result from the alternatives under consideration. It seeks to compare the alternatives, identify differences between the alternatives, and provide the Council with information useful for selecting final measures to be submitted in Framework 33.

The “baseline” scenario with which Framework 33 alternatives are compared represents the status quo, i.e., 1999 fishery conditions. Fishery regulations during 1999 included Framework 26 and 27 “rolling closures,” a year-round western Gulf of Maine area closure, various Gulf of Maine cod trip limits, and a partial year trip limit for Georges Bank cod of 2,000 pounds. This is the scenario against which management options will be compared. Any social impacts likely to result from the Framework 33 alternatives can be attributed to changes to the above baseline scenario. While the prevailing socioeconomic atmosphere in affected fishing communities during 1999 is unknown at this time, comparison to a 1999 baseline is still useful to identify specific (new) management measures that are likely to produce either negative or positive social impacts and to identify critical areas or “hotspots” where social impacts could be more severe, at least during the short-term.

#### 4.3.2.1 Scale of Assessment – Fishing Communities

For the purposes of this social impact assessment, fishing communities will serve as the primary scale of measurement. Section 316 of MSFCMA defines a fishing community as:

*“a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community.”*

It is important to note that fishing communities are not “bounded” or separated from the commerce and institutional apparatus of the larger cities and towns in which they are located. In fact, most fishing communities rely on a rather complicated network of business and social ties that extend well beyond the boundaries of their communities and often into other fishing communities in the region.

A comprehensive social impact assessment considers impacts on both primary and secondary fishing communities throughout the region. The fishing communities most likely to be affected by the management actions under consideration in this framework adjustment are the ones whose vessels and shoreside facilities depend on groundfish resources and/or the ones that are located adjacent to areas proposed for closure. For the Gulf of Maine management measures, the primary fishing communities to consider include Portland (ME), Gloucester (MA), and Portsmouth/Hampton (NH). Secondary communities include Rockland and downeast (ME),

North Shore (MA – Newburyport and Boston), South Shore (MA – Scituate and Plymouth), and Provincetown (MA). For the Georges Bank management measures, primary fishing communities likely to be affected include Chatham (MA), New Bedford (MA), Point Judith/Narragansett (RI), and Stonington (CT). Secondary communities include several smaller ports along Cape Cod (MA) and several smaller ports in Rhode Island and Connecticut.

When predicting social impacts of management measures according to a set of assessment variables, it is important to consider changes to the following components of each fishing community:

- The fishing fleet (vessels grouped by fishery, primary gear type, and/or size);
- Boat owners and captains;
- Crew;
- Fish buyers (dealers);
- Seafood markets;
- Community cooperatives;
- Fishing industry associations;
- Cultural components of the community;
- Fishing families.

#### **4.3.2.2 Assessment Variables**

When conducting a social impact assessment, it is useful to identify a set of assessment variables, which can then be compared to a baseline scenario to predict the potential social outcomes of various management alternatives. When establishing a baseline scenario, these assessment variables are often measured through “social indicators,” or a set of multidimensional measures that help to provide a concise description of baseline socioeconomic conditions in the community. Some examples of social indicators include voting rates, land use, household composition, material production, library loan rates, unemployment rates, and per capita income. In theory, measurement of a relevant social indicator before and after a management action becomes effective should help quantify the change caused by the action, allow for a better understanding of the social impacts of the action, and improve the ability to monitor changes in communities resulting from future management actions.

Because information on the measurement of social indicators in fishing communities is currently incomplete, this assessment cannot predict the social impacts of management alternatives based on measurable changes in social indicators (and consequently changes in the assessment variables). Instead, this analysis qualitatively discusses the likelihood of experiencing changes in the assessment variables and characterizes the likely magnitude and direction of the change. Ideally, to assess the accuracy of the predictions made in this analysis, one would measure a set of social indicators chosen to reflect changes in the identified social impact assessment variables.

The variables described in the following subsections will be considered relative to each management alternative and will be used as a basis for comparison between alternatives. While not enough data exist to comprehensively assess and measure the potential changes in the identified assessment variables, discussion of the potential changes in the variables as a result of management actions provides information useful for better decision-making. Towards that end,

assessment of the potential changes to the social impact assessment variables should be considered in the following context:

1. Size and demographic characteristics of the fishery workforce in the community –changes in these factors reflect demographic, income, and employment impacts in relation to the community’s available fishery workforce
2. Cultural issues – attitudes, beliefs, values of fishermen, their families, and their communities
3. Social structure and organization – the ability of communities to provide necessary social support and services to families
4. Non-economic social aspects – lifestyle, health, and safety issues
5. Historical dependence on fishery – reflected in the structure of fishing practices and income distribution

#### **4.3.2.2.1 Formation of Attitudes and Interest Group Activity**

*Formation of Attitudes* – positive or negative feelings, beliefs, or positions expressed by impacted members of the fishing communities regarding the alternatives under consideration for Framework 33; this variable provides information about the community climate that prevails; can help to assess the need for mitigation; measurement of this variable will provide for a better understanding of how changes induced by this framework adjustment could influence the affected communities.

*Interest Group Activity* – formal and informal interest organizations stating positions for or against the alternatives under consideration; “interest groups” are defined as identifiable forces active in the fishery and in fisheries management that represent sub-categories of the fishery that stand to gain or lose by the implementation of the management measures proposed in the framework; interest group activity can play an important role in shaping the community’s response to fishing regulations.

Within the New England groundfish fishery, the attitudes of the various parties with a stake in the fishery (commercial and recreational fishermen, processing industry, shore-based industries, etc.) toward the measures contained in the framework adjustment are critical components for determining how the parties perceive that the impacts are distributed throughout the fishery. Attitude formation plays a key and often overlooked role in the general level of compliance and cooperation with regulators and with the Council.

Management of the Northeast groundfish fishery has been, and continues to be, a politically contentious effort to allocate potentially significant economic benefits to competing user groups while preserving the long-term viability of the resource base. As the status of the Gulf of Maine cod fishery has declined and social and economic dislocation has increased, particularly in the period following the implementation of Amendments 5 and 7, the process has become heavily impacted by an increasing number of interest groups. A systematic examination of these groups, i.e., how they are organized; what their goals, objectives, and activities are; how they participate in the management process directly and indirectly, as a component of this assessment would provide a critical understanding of the existing and potential role for interest groups in the management process.

Assessment of this variable should address the following questions:

- How could attitudes and perceptions within an affected community shape its overall reaction to the management measures under consideration?
- What are the attitudes and perceptions of interest groups and communities towards the proposed action? Are they more positive or more negative than those towards the alternatives that were rejected by the Council?
- What interest groups have been most involved in the development of the Framework 33 alternatives? Can their involvement help to mitigate some of the negative social impacts of the management measures in the short-term?

#### **4.3.2.2.2 Changes in Occupational Opportunities**

*Description* – the degree to which the implementation of the alternatives in this framework could alter the occupational profile of the affected fishing communities; changes in occupational opportunities can lead to changes in household/family income, classes, and lifestyles; in assessing this variable, both the short-and long-term shifts in job opportunities should be considered.

The economic implications of changes in occupational opportunities for resource-dependent fishing communities are well-documented and are often erroneously equated with social impacts. Impacts arising from changes in occupational opportunities that are more social in nature are more difficult to identify and quantify. Emphasis should be placed on identifying potential changes in the unique social and family arrangements that characterize the communities under consideration, particularly on changes in household employment patterns, trends in family-run fishing businesses, and participation in job retraining programs. Special consideration should also be given to social and cultural values and norms that may be affected by changes in opportunity, such as long-term family involvement in the fishery, job satisfaction, and respect for fishing as an occupation and a way of life.

Assessment of this variable should address the following questions:

- Could the proposed action change the structure and/or composition of New England’s fishing fleets? Are these changes different than those expected under the other alternatives considered by the Council?
- Are the management measures proposed in this framework adjustment likely to affect the supply and/or cost of fishing-related employees?
- Will New England’s fishermen have alternative fishing opportunities under the proposed action?
- Is the proposed action likely to increase the number of fishermen who are leaving the fishery and getting retrained in other occupations?

#### **4.3.2.2.3 Industrial Diversification and Changes in Community Infrastructure**

*Industrial Diversification* – this variable characterizes changes in the number and variety of fishing opportunities available to the affected communities under each framework alternative; potential changes in the makeup of the commercial fleet (including specification by gear types, vessel sizes, crew sizes) and the recreational fleet should be considered; the more diverse the fishing fleet is, the better able it is to absorb the impacts of more restrictive fishing regulations.

*Changes in Community Infrastructure* – this variable measures the increase or decrease in the demand and supply of basic infrastructure services and facilities essential to fishing in the affected communities, including processors, seafood markets, boat and equipment repair shops, bait and ice providers, display auctions, cooperatives, creditors, legal services, etc.; the cost and availability of these services can affect fishing community members’ business practices, satisfaction with their community, and overall well-being.

Assessment of the potential for industrial diversification is critical for two reasons: (1) gear types, vessel sizes, and commercial/recreational status are categories directly addressed in the framework adjustment, and (2) social groups in the fishery are often organized around membership in these user groups. Measuring diversification within the fishing industry helps to predict how various sectors directly participating in the fishery could revise their operations to better adapt to the regulations implemented through this framework adjustment. This should provide some insight into the ability of the groundfish fleet (and its components) to diversify into other fisheries.

The cost, quality, availability, and location of fishing-related services not only directly impact the daily operations and business decisions of fishermen, but also influence the well being of participants in the fishery and their perceptions about their lifestyle and community. Additionally, these service industries provide alternative, fishing-related employment opportunities in port communities and contribute significant revenues to the county or city in which the fishing community is located.

Assessment of this variable should address the following questions:

- How could shoreside infrastructure in fishing communities be affected by the proposed action? (this includes processors, dealers, markets, bait and gear suppliers, etc.)
- Can New England fishing fleets adapt to the regulations implemented through this framework adjustment? How?

#### **4.3.2.2.4 Disruption in Daily Living**

This variable characterizes changes in the routine living and work activities of participants in the groundfish fishery, including the potential for alteration in their regular social and work patterns to minimize the impact of the management measures; consideration should be given to changes in daily living that affect perceptions of the port community, including the willingness of residents and outsiders to invest time and money in the port community.

Measuring changes in established daily patterns – patterns that, in the case of fishing communities such as those identified for study here, are often internally generated and regulated and highly regimented – can provide a key component to social impact assessment. Although the existence, nature, and evolution of these patterns in fishing communities is well documented by marine anthropologists, the effects of changes to these patterns have often been overlooked in conducting social impact assessments for fishery management. This variable is particularly relevant for this assessment because of the seasonal area closures that are a component of most of the alternatives under consideration. Inshore, “rolling” area closures could result in 3-4 months of relative

inactivity in some of the fishing communities. Ideally, measurement of disruption in daily living in these communities should include an assessment of the outcomes of this period of inactivity, including changes in social stress and stress-related health problems, job satisfaction, crime rates, and family cohesion.

Assessment of this variable should address the following questions:

- How could the proposed action alter the daily living and work patterns of fishing families in the affected communities?
- Will fishermen need to travel to new fishing grounds or fishing grounds farther away from their homes? Will fishermen be spending more time away from home?
- Could the proposed action increase stress at the family level?

#### **4.3.2.2.5 Alteration in Family Structure**

Measurement of this variable should predict increases or decreases in one or more of the measurable family status categories (e.g., married, never married, female head of household, with/without children) within the fishery as a result of the management measures under consideration for this framework adjustment.

Assessment of this variable should describe, to the extent possible, the impact of the proposed management measures on the fishing family units in the affected fishing communities. To date, many of the factors that are described when characterizing changes in this variable (changing divorce rates, spouses entering the workforce, increased absence of fishermen from the home as a result of joining the crew on a large vessel) are frequently cited in fisheries-related social and economic impact assessments, but have not been systematically measured for the New England multispecies fishery. Measurement of this variable can also characterize the extent to which other members of the fishing family (spouses) have been forced to enter the workforce to provide the family with a secondary source of income.

Assessment of this variable should address the following questions:

- Could the proposed action alter the structure of fishing families in the affected communities? How?
- Will more spouses be forced to enter the workforce as a result of the management measures?
- Could the framework action result in the dissolution of fishing families in affected communities?

#### **4.3.3 General Discussion of Measures Under Consideration**

The following sections generally discuss social impacts associated with trip limits (and/or possession limits) and area closures. All of the Framework 33 alternatives, including the proposed action, include trip limits and area closures as the primary management tools. The following discussion, therefore, applies to all alternatives under consideration for Framework 33, including the proposed action.

#### 4.3.3.1 Trip Limits

Trip limits are an important component of the Framework 33 management measures. Trip limits are proposed for Gulf of Maine cod, Georges Bank cod, and for haddock. All four options under consideration for the Gulf of Maine in this framework adjustment propose that the Gulf of Maine cod trip limit be set at 400 pounds per day. This represents the status quo (as of Framework 31) and an overall increase from trip limits as low as 30 or 100 pounds during 1999.

In general, trip limits can affect the structure of a fishery. If the trip limit is set very low, the inshore sector of the fleet can sometimes manage to fish economically, while the offshore sector of the fleet cannot cover trip expenses. This can change the structure of financial rewards generated in the fishery and can ultimately change the short- and long-term structure of the fishery itself. These types of impacts, however, have not been evident in the Gulf of Maine cod fishery since 1998 because cod trip limits have been set too low for even small, inshore vessels to fish for cod economically.

Fishermen's views on trip limits are generally based on what they perceive the limit will do to their income, not that a trip limit itself holds some socially or culturally undesirable characteristic. However, Gulf of Maine cod trip limits have recently been set so low that they indeed hold a socially undesirable characteristic: regulatory discarding. Over the past year, fishermen have testified at Groundfish Committee and Council meetings that, at some times of the year, they have been forced to discard large quantities of Gulf of Maine cod due to an extremely restrictive trip limit. This is something that fishermen in general *do not* want to do. Recently, fishermen have referred to the discarding of Gulf of Maine cod as a "sickening" or "disgusting" waste of a valuable resource. They understand that throwing fish overboard once they are caught does not contribute to rebuilding the stock (since most of the fish are already dead), and they perceive the low trip limit and discarding as a means to prolong the stock's recovery time and, consequently, their own hardships. Fishermen hate to throw fish overboard, and regulations that force them to do so increase their negative feelings towards fishing and fisheries management. Some fishermen even favor non-compliance with the regulations over wasting the resource from which they make their living.

Any alternative that increases the Gulf of Maine cod trip limit to a level that minimizes regulatory discarding without compromising stock recovery will undoubtedly improve the social impacts of the trip limit itself since most of the negative social impacts result from attitudes that form when fishermen are forced to discard their catch.

#### 4.3.3.2 Area Closures

All of the alternatives under consideration for the Gulf of Maine and Georges Bank in this framework adjustment include area closures, either year-round or seasonal "rolling" closures, or both. The following provides a general discussion of the potential social impacts of such area closures in the Gulf of Maine and Georges Bank. The potential impacts of specific alternatives are discussed in subsequent sections of this analysis.

In general, two categories of fishing vessels will be most affected by the area closures proposed in this framework adjustment: (1) vessels from fishing communities directly bordering the proposed

area closures, and (2) vessels from other fishing communities that have traditionally accessed the proposed closed areas to fish. Affected vessels from both categories include not only those vessels that fish for Gulf of Maine or Georges Bank cod, but also those vessels that fish for other species like flatfish or scallops.

The vessels in Category (1) will be the most directly affected by the inshore and “rolling” area closures because the area closures border on the coastlines of their communities and, in some cases, extend up to 80 or 100 miles offshore for a period of time. For the Gulf of Maine, these vessels are primarily based in the communities of Gloucester, Newburyport, Provincetown, and Boston, Massachusetts as well as most communities along the New Hampshire coastline. For Georges Bank, these vessels are primarily based in communities like New Bedford (MA) and communities along outer Cape Cod (primarily Chatham and Harwichport), Massachusetts.

Within this category of affected vessels, smaller vessels (less than 51 GRT) will be at a greater disadvantage to adjust to the regulations because of their inability to travel beyond the area closures to fish. Medium and larger-sized vessels will undoubtedly be constrained and inconvenienced, but the physical characteristics of these vessels may allow them to sustain some level of offshore fishing activity during the time period of closure. A majority of the vessels in question, especially those from Gloucester, Chatham, Harwichport, and communities in New Hampshire, are smaller-sized vessels and may be forced to seek alternatives to fishing for multispecies due to the closures. This held true for the inshore area closures implemented through Frameworks 25, 26, and 27. The communities in which these vessels conduct their fishing activities are likely to demonstrate the greatest short-term social impacts resulting from the proposed framework action.

The second category of affected vessels is comprised of vessels that have accessed the proposed closed areas to fish for a variety of species and are now facing closure of these fishing grounds. Although some of the affected vessels in this category include those from fishing communities bordering the area closures (see Category (1) above), others may come from communities in Maine and other New England and Mid-Atlantic states. These vessels, while inconvenienced and limited in terms of their flexibility, may still have the opportunity to fish in other parts of the Gulf of Maine as well as in other regions. Most vessels that have the capability to travel from their home communities to the proposed closure areas will be able to travel to alternative areas to fish. Thus, affected vessels in Category (2) but not in Category (1) are more likely to shift their effort into other areas (and perhaps onto other species) and should have the opportunity to maintain an overall level of fishing closer to their historic levels. The communities in which these vessels conduct their fishing activities (Portland, Maine, for example) are less likely to experience short-term social impacts resulting from the proposed framework action.

There are other sectors of the groundfish industry that are likely to be affected by the proposed area closures. Shoreside facilities that supply bait, ice, fishing gear, and other supplies may suffer from a decrease in fishing activity in their communities, especially if vessels in their communities are unable to access fishery resources for a period of time. The greater dependence on fishing for groundfish in communities like Gloucester could ultimately lead to a greater potential for community economic dislocation resulting from the management measures. According to recent

information from the U.S. Census Bureau, Essex County (Gloucester, MA) employs close to 6,000 persons in fishing related businesses (processing, seafood markets, vessel repair, etc.). Support infrastructure in communities such as Gloucester is estimated to be at a premium, and very little additional infrastructure could be lost without having a major impact in the ability of the fleets in these communities to operate (Aguirre International, 1996).

Loss of income, changes in the structure of the fishery, and displacement from the fishery are likely to result in the short-term from the area closures proposed in most of the alternatives under consideration. The need for financial assistance, when combined with the perception of lowered social status resulting from decreased income, can often result in lowered self-esteem and negative impacts on job satisfaction. These social impacts are often consequences of any management plan directed at reducing exploitation. They also tend to manifest themselves in alternatives that include either large-scale, long-term area closures or nearshore area closures that preclude opportunities for smaller vessels.

Inshore closures like those proposed in some of the Framework 33 alternatives may require that vessels find new fishing grounds and/or travel farther to fish. The potential need to spend more time at sea as a result of Framework 33 area closures may produce negative short-term social consequences. In fact, length of time at sea has been cited as an important characteristic affecting job satisfaction because of the amount of time fishermen are required to spend away from their families and communities and because of the potential for owners of smaller vessels to compromise their own safety to maintain income during the closure time (Pollnac and Littlefield, 1983).

The Council acknowledges and understands the potential short-term social ramifications of additional inshore area closures proposed in Framework 33. When selecting the final alternative for inclusion in Framework 33, the Council considered the potential socioeconomic effects of the area closures on communities, especially those neighboring the closure areas. The Council is trying to maximize the protection of Gulf of Maine and Georges Bank cod while minimizing the economic impact on fleet revenues in the groundfish fishery and in other fisheries. Quite often, minimizing negative economic impacts serves as a means to minimize social impacts resulting from regulations. The Council recognizes that any closures implemented through Framework 33 will produce additional negative short-term consequences for affected communities, but it believes that the closures are critical to achieving conservation and management objectives for Gulf of Maine cod and Georges Bank cod. In turn, when selecting the final alternative, the Council hopes to minimize short-term adverse impacts on fishermen, their families, and their communities by minimizing economic dislocation resulting from the area closures.

In summary, the additional area closures proposed in Framework 33 will probably require fishermen and their respective communities to adjust to the regulations aimed at rebuilding commercial groundfish stocks. How these adjustments will affect individuals, their families, and their communities varies with a number of factors, such as their dependence on Gulf of Maine or Georges Bank cod and their ability to increase the value of a reduced catch or to shift effort to other fisheries in order to maintain a stream of revenues.

These impacts, however large or small, must be compared to the potential impacts of taking no action. Taking no action to protect Gulf of Maine cod in particular as well as other groundfish at this time could quickly result in stock biomass falling below the minimum biomass threshold as well as the potential for significant recruitment failure. According to the Amendment 9 control rule, when the Gulf of Maine cod stock biomass falls below the minimum biomass threshold, the Council is required to reduce mortality to as close to zero as practicable. If the Gulf of Maine cod stock were to continue to decline, the Council would be required to take additional management action, the social consequences of which are likely to be more severe and much larger in scale. In addition, further declines in stock levels would lengthen recovery periods and, therefore, the period over which the greatest negative social impacts are felt by affected communities.

#### **4.3.3.3 Gulf of Maine Options**

The following sections discuss the potential impacts of each Gulf of Maine cod alternative under consideration. At the final Framework 33 meeting, the Council selected Gulf of Maine Option 2 (with the “backstop” area closures) as the proposed action.

##### **4.3.3.3.1 Gulf of Maine Option 1**

Gulf of Maine Option 1 extends many of the current management measures into the 2000-2001 fishing year. Proposed area closures include those implemented in Frameworks 26, 27, and 31 as well as an extension of the year-round western Gulf of Maine closure. This option proposes the same trip limit for Gulf of Maine cod as Framework 31 (400 pounds per day plus the interim running clock). Under this option, the first day of a trip *may* be counted as either 15 or 24 hours, or the status quo. In addition, this option would require vessels (except day gillnet vessels) to take layover days equal to their trip length during May-June, July, November, and December. Day gillnet vessels would instead be limited to 80 net tags (40 nets) year-round.

The primary differences between this option and the status quo are the method for counting the first day of a trip, the provision for layover days equal to trip days during part of the year, and the limitation to 80 net tags for day gillnet vessels. No changes from the status quo in terms of revenues and/or costs are expected with the area closures and trip limits proposed in Option 1. Therefore, the social impacts of the area closures and trip limits in Option 1 should be consistent with those under the status quo. (However, there may be social impacts associated with the status quo scenario, especially when compared to the Amendment 7 baseline. Amendment 13 to the Northeast Multispecies FMP is intended to better assess and characterize these social impacts.)

In general, the above factors are not likely to affect the formation of attitudes towards this alternative or the involvement of interest groups in the development of this alternative. Most of the attitudes towards this alternative reflect negative feelings about the proposed area closures, which remain as they were in 1999. Day gillnet vessels as a group, however, may perceive this alternative to be unfairly directed towards them, as it requires them to reduce their active nets by 50%. This provision is expected to result in a negative impact on revenues for at least some gillnet vessels, although the extent of this impact cannot be assessed quantitatively. The gillnetters that do lose revenues will be forced to seek alternative sources of income. For most, this will mean finding other fisheries and other places to fish. Seeking alternative fisheries,

however, has become increasingly difficult due to restrictions in other fisheries (shrimp, monkfish, dogfish, and small mesh fisheries, for example). For the most significantly affected, this will mean investing substantial money to change gear types or exiting the fishery altogether.

Day gillnetters, however, do not lose some of their flexibility from a layover provision, as it does not apply to them. All other vessels will be required to take layover days during some part of the year. Layover days tend to reduce vessels' flexibility for planning fishing trips, responding to market conditions, and receiving the most money for their product. For owners, captains, and crew on some vessels, this provision could represent a significant alteration to their daily living and work patterns. Some vessels fish continuously for a period of time in order to maximize their profits and then stop fishing when they cannot do so or when the market does not allow for profit maximization. These vessels will be required to alter their practices during times when they would be required to take layover days equal to their trip days.

For some fishing families, layover days might seem to represent a welcome break from fishing activities and an increased opportunity to spend time together at home. Instead of being away from home for most of the month, fishermen may find themselves at home as many days during the month as they are away. This may be viewed as a positive social impact to the extent that it improves fishing family relations and decreases family stress resulting from being away from home. However, the benefits of this provision greatly depend on the ability of fishermen and fishing vessels to adapt to the layover requirement. If fishermen cannot compensate for their lost revenues from the time off during the trips that they do take, during other times of the year, or through other career opportunities, this provision is more likely to increase stress at the family level, as families will be required to seek alternative sources of income.

The proposed requirement to count the first day of a trip as 15 or 24 hours could affect not only the vessels fishing for Gulf of Maine cod, but all groundfish vessels, even those fishing on Georges Bank or in southern New England and Mid-Atlantic waters. For southern vessels, this provision could be particularly constraining, especially because these vessels have already lost their opportunity to fish for many groundfish stocks whose populations have diminished throughout the southern extent of their range. In addition, counting the first day of a trip at either 15 or 24 hours would impact smaller vessels that fish primarily in inshore areas on trips that last less than 24 hours. Many of these vessels traditionally make 8-12 hour trips and are constrained by weather conditions, their vessels' capacity, or both. These vessels may be disproportionately affected by a requirement to count the first day of a trip as 15 or 24 hours. Furthermore, these are the same vessels that are likely to be most affected by inshore or "rolling" area closures. Counting the first day of a trip at 15 or 24 hours does not help to mitigate the negative social impacts of the area closures and may exacerbate them.

In summary, the positive and negative social aspects of this alternative include:

- + It continues the current management strategy with minor modifications and therefore minor social disruption upon implementation.
- Fishermen have testified on several occasions that they do not support the current area closures primarily because of their disproportionate impact on smaller and inshore vessels.
- Layover days can decrease vessels' flexibility and disrupt daily living and working patterns.

- DAS counting for the first day of a trip would affect all vessels, not just those fishing in the Gulf of Maine, and they have a disproportionate impact on smaller vessels that are likely to be most affected by the inshore and “rolling” area closures.

#### **4.3.3.3.2 Gulf of Maine Option 2 (The Proposed Action)**

The proposed action extends many of the current management measures into the 2000-2001 fishing year. Area closures include those implemented in Frameworks 26, 27, and 31 as well as an extension of the year-round western Gulf of Maine closure. This option proposes the same trip limit for Gulf of Maine cod as Framework 31 (400 pounds per day plus the interim running clock). In addition, this alternative included either a “backstop” for preventing a TAC overage (additional area closures) or a year-round closure of the northern half of Block 124 (instead of a “backstop”). The Council selected the “backstop” that closes the Cashes Ledge Closed Area for one additional month (November) and Blocks 124 and 125 in January if 50% of the Target TAC for Gulf of Maine cod is landed by July 31.

Under this alternative, the first day of a trip could have been counted as either 15 or 24 hours, or the status quo. The social impacts of counting the first day of a trip differently are discussed in 4.3.3.3.1. Based on the potential distribution of impacts and on the recommendation of the Advisory Panel and the Committee, the Council determined that the costs associated with this provision may outweigh its conservation benefits. Although the Council is not proposing any changes to counting DAS in this framework adjustment, it may consider this action during the development of Amendment 13 to the Multispecies FMP.

The only significant difference between the proposed action and the status quo is the “backstop” to prevent the TAC from being overshot (November and January area closures). The impacts of area closures are generally discussed in Section 4.3.3.2. Aside from the impacts of the “backstop” closures, no changes from the status quo in terms of revenues and/or costs are expected with the area closures and trip limits contained in the proposed action. Therefore, the social impacts of the area closures and trip limits proposed in Framework 33 should be consistent with those under the status quo. (However, there may be social impacts associated with the status quo scenario, especially when compared to the Amendment 7 baseline. Amendment 13 to the Northeast Multispecies FMP is intended to better assess and characterize these social impacts.)

As previously mentioned, additional impacts can be expected from the proposed “backstop” area closures. In general, “backstops” are not widely supported as management tools to achieve the conservation objectives of a suite of management measures. “Backstops” often make business and trip planning more difficult for the fishing fleet. Many vessels try to plan their DAS usage and fishing strategies in advance to maximize their efficiency and obtain better prices for their products. Not knowing what regulations they will be facing throughout the fishing year minimizes their ability to respond to the regulations and modify their fishing and business practices accordingly.

The Council considered the costs and benefits of both “backstop” alternatives before selecting the proposed “backstop” to both maximize the effectiveness of the measure and minimize its potential negative impacts. Specifically, the Council considered that additional closed areas are likely to

result in disproportional effects for the boats that fish in the areas and for the communities adjacent to the areas. The “backstop” alternative to close Cashes Ledge in November and Blocks 124 and 125 in January, which the Council selected, is likely to produce fewer social impacts than the option to close the northern half of Block 124 year-round for several reasons.

First, the proposed “backstop” alternative is projected to result in a loss of total fleet revenues of \$0.1-\$0.6 million, while the less-favored “backstop” alternative is projected to decrease fleet revenues by \$1.4-\$5.4 million. Since economic impacts are quite often related to social impacts, one can assume that the social impacts of the proposed “backstop” will also be less severe than the alternative to close the northern half of Block 124 year-round. Second, Cashes Ledge is located further offshore than the other proposed closures. While vessels that fish on Cashes will certainly be affected, areas surrounding Cashes would continue to remain open for fishing. The Cashes alternative, therefore, does not directly impact some communities without affecting others. Furthermore, the vessels that access Cashes Ledge are larger vessels capable of accessing areas further offshore and therefore may be better suited to adapt to such a closure. Third, because both inshore and offshore areas are proposed for closure, the preferred “backstop” is likely to more evenly distribute any negative social impacts that result from closing the areas. Finally, the closure of the northern half of Block 124 significantly affects communities like Scituate, Plymouth, and Provincetown, whose smaller vessels access this area throughout the year. Year-round closure of this area would disproportionately affect these vessels without leaving them with many viable alternatives for adapting to the regulations.

In summary, the positive and negative social aspects of this alternative include:

- + It continues the current management strategy with minor modifications and therefore minor social disruption upon implementation.
- Fishermen have testified on several occasions that they do not support the current area closures primarily because of their disproportionate impact on smaller and inshore vessels.
- /+ While “backstops” generally have negative social aspects associated with them, the Council selected the “backstop” alternative that is likely to produce the fewest social impacts (versus the status quo).

#### **4.3.3.3.3 Gulf of Maine Option 3**

Gulf of Maine Option 3 proposes status quo on DAS and DAS counting, a new set of area closures, and a one-year extension of the western Gulf of Maine closed area. In addition, this option proposes the same trip limit for Gulf of Maine cod with a two-day layover requirement or a running clock as in Framework 31 (interim running clock). Option 3 also includes a proposal to increase the cod minimum size to 21 inches.

The major differences between this option and the status quo are the proposed area closures and the proposed increase in the cod minimum size. The social impacts of area closures are generally discussed in Section 4.3.3.2. The economic impacts of the closures proposed in Option 3, however, are projected to be positive when compared to the status quo, as Option 3 proposes “rolling” closures for only one month, and the rest of the proposed closures are distributed slightly more offshore and throughout the Gulf of Maine. The area closures proposed in Option 3 are also intended to provide for additional fishing opportunities, especially for the inshore fleet. The

economic analysis indicates that Option 3 is likely to result in increased fleet revenues from all species. To the extent that the proposed area closures do allow opportunities for the inshore fleet, the social impacts resulting from loss of income could be reduced. In addition, if more inshore areas are open, the social impacts of traveling farther from home to fish or traveling to new, unfamiliar fishing grounds are also reduced.

The potential social impacts of layover requirements in terms of flexibility are discussed in Section 4.3.3.3.1. It is difficult to predict the potential social impacts of the proposal to increase the minimum size of cod to 21 inches. However, this proposed increase is not accompanied by a proposal to increase mesh size, so it is probably perceived as a measure that is likely to increase cod discards. Unfortunately, existing data do not support the analyses necessary to confirm or deny this perception. Fishermen do not like to discard their catch, and discarding alone has the potential to produce negative social impacts. These impacts are briefly discussed in Section 4.3.3.1 with respect to trip limits. To the extent that a cod size increase generates additional regulatory discards, this provision is likely to result in negative social impacts. It is important to note that this size increase would apply to cod throughout its range, not just to Gulf of Maine cod. Fishermen in other areas may oppose this provision not only because they feel that it could generate discards, but also because they feel that they are being forced to make sacrifices for a problem they didn't create. While Georges Bank cod is also in need of management attention (and is addressed in this framework adjustment), vessels in fishing communities in Georges Bank may not be anticipating an increase in the minimum size for cod, nor may they be supportive of it.

In summary, the positive and negative social aspects of this alternative include:

- + The proposed area closures appear to distribute the negative impacts of area closures (dislocation, inability to access fishing grounds) more evenly throughout the Gulf of Maine and throughout inshore and offshore areas. The social impacts of these closures should therefore be distributed more evenly.
- It is difficult to predict the social impacts of the proposed cod size increase, but to the extent that this provision increases discarding, the social impacts will be negative. Impacts of this provision could be positive for hook and gillnet vessels if it offsets potential closures. Also, this provision was suggested to the Council by hook and gillnet fishermen and appears to have support from these sectors of the fishery.
- The social impacts of the proposed cod size increase would extend beyond the Gulf of Maine and throughout the range of the species, affecting communities throughout southern New England and some in the Mid-Atlantic.

#### **4.3.3.3.4 Gulf of Maine Option 4**

Gulf of Maine Option 4 proposes a call-in maximum 25 DAS program for vessels fishing in a restricted inshore area from February-May. It also proposes a new set of year-round area closures and seasonal closures based on one-month “rolling” closures from Framework 25. Party/charter vessels would be prohibited from fishing in the closed areas from February-May. This option proposes a 400-pound trip limit for Gulf of Maine cod with running clock and a two-day layover requirement. Usage of the running clock and the layover requirement would be prohibited from February-May.

This option differs from the status quo in many respects. First, this option would require vessels to declare into a special category to fish in the Western Gulf of Maine Restricted Gear Area. The specifications of this program are intended to reduce overall fishing power during the spring months and to provide equitable access to alternative species and fishing grounds. The enrollment program and consequent limitation to 25 DAS would affect the vessels that land the majority of fish and use most of their DAS during the spring time. This could significantly impact the daily business and work patterns of people fishing on or working with these vessels. They would be required to adapt to reduced fishing during their most productive months and seek alternative sources of income during the time of year when they are not used to fishing as much. The interest groups that developed this proposal maintain, however, that the impact of this provision is much less severe than the impacts of the Framework 25, 26, and 27 area closures.

One important aspect of this proposal is the prohibition for party/charter vessels to fish in the closed area from February-May. This prohibition is likely to produce significant social impacts that extend beyond the impacts on the party/charter vessels and their crew. This prohibition substantially decreases the opportunity for recreational fishermen to access fishery resources and participate in fishing activities. This loss, although difficult to quantify, must be considered. Most people who fish on party/charter vessels do so because they do not own a boat of their own. Many people develop positive feelings about fishery resources either simply from the existence of these resources or the fact that they can access them to derive recreational enjoyment. The social impacts of this provision, therefore, affect not only vessels, their crew, and their dependent shoreside facilities, but also an non-quantifiable component of the general population that enjoys fishing recreationally.

Interest group activity is an important variable to discuss in relation to this alternative. Gulf of Maine Option 4 was developed and submitted to the Council by a sector of the fishing industry. Although it has lost much of its association with the group, Option 4 was developed from the Gulf of Maine Fishermen's Alliance, Inc., a recently formed and very active industry association interested in maintaining viability for the Gulf of Maine fishing fleet. However, not all of the industry supports this proposal (the Gulf of Maine Fishermen's Alliance is comprised primarily of small- to medium-sized vessels, and Option 4 is not widely supported by larger vessels). In general, though, this option has more industry support than the other options under consideration. Not only could this increase compliance with the proposed measures (depending on the magnitude and extent of industry support), but it could also improve fishermen's general sentiments about fishing as an occupation and a way of life.

In summary, the positive and negative social aspects of this alternative include:

- + The proposed area closures appear to distribute the negative impacts of area closures (dislocation, inability to access fishing grounds) more evenly throughout the Gulf of Maine and throughout inshore and offshore areas. The social impacts of these closures should therefore be distributed more evenly.
- The social impacts of the 25 DAS enrollment program are likely to fall mostly on vessels that land the majority of fish and use most of their DAS during the spring time for the purpose of maximizing their business opportunities.
- + This option is supported by a segment of the fishing industry that represents smaller and

- medium-sized vessels, which are most likely to be affected by the measures, particularly the inshore area closures. Support for management measures increases positive attitudes about fisheries management as well as the potential for compliance with the regulations.
- The social impacts of the party/charter restriction affect not only vessels, their crew, and their dependent shoreside facilities, but also a component of the public that enjoys fishing recreationally.

#### **4.3.3.3.5 Qualitative Comparison of Gulf of Maine Options**

Table 94 represents a qualitative, comparative analysis of the four Gulf of Maine alternatives under consideration in this framework adjustment. The table compares the four alternatives to each other and “ranks” them based on potential changes to the assessment variables identified and discussed in Section 4.3.2.2 . In the table, a “+” denotes that the change is expected to be positive, while a “-” indicates that the change is likely to be negative. A “0” indicates that the change is not likely to differ significantly from the status quo. Additional comments are provided to better characterize the differences between the four alternatives under consideration. Where possible, Table 94 identifies the alternative that is likely to produce the most positive or most negative effect on the assessment variable. This is a difficult prediction, as much of the impact will result from changes in fishing behavior and/or the ability of fishermen and their communities to adapt to the management measures proposed in the framework adjustment.

It is important to note that the predictions represented in Table 94 are solely with respect to changes in the social conditions of the fishery and/or the affected fishing communities and not in the context of the biological (and, to a degree, economic) impacts of the management alternatives. If an option is not expected to meet the biological objectives of the management program, then its social consequences extend beyond those described in Table 94 and resemble the long-term consequences of not rebuilding fishery resources to sustainable levels.

In addition, please note that the management measures proposed in Framework 33 are represented by Gulf of Maine Option 2 in Table 94.

	<b>Attitudes and Interest Group Activity</b>	<b>Changes in Occupational Opportunities</b>	<b>Industrial Diversification and Community Infrastructure</b>	<b>Disruption in Daily Living</b>	<b>Alteration in Family Structure</b>
<b>OPTION 1</b>	- MOST NEGATIVE negative perception b/c too much like SQ; not likely to increase interest group activity; less favorable with day gillnet boats	- not likely to differ from the SQ except for signif. decrease in opportunities for day gillnet boats - neg. impact of counting the first day of trip	0 not likely to differ from the SQ if day gillnet boats can adapt and/or diversify	-MOST NEGATIVE not likely to differ from the SQ except for part-time layover provisions and DAS counting which disrupt daily business and work patterns	<b>0</b> not likely to differ from the SQ; layover provisions could have negative and/or positive impact
<b>OPTION 2: THE PROPOSED ACTION</b>	- negative perception b/c too much like SQ; not likely to increase interest group activity	- not likely to differ from the SQ except for effects of "backstop" closures	0 not likely to differ from the SQ, but depends on selection of "backstop" closures	0 not likely to differ from the SQ	<b>0</b> not likely to differ from the SQ, but true impact depends on "backstop" closures
<b>OPTION 3</b>	+ more positive b/c it's diff. from the SQ;	+ MOST POSITIVE new closures provide additional opportunities for nearshore vessels	+ MOST POSITIVE new closures provide additional opportunities and could allow for more consistent supply of product to affected communities	- layover provisions disrupt daily business and work patterns + area closures minimize disruption caused by SQ closures	+ increased opportunity in fishery minimizes need for alternative income; layover provisions could have negative and/or positive impact (more likely negative due to financial concerns)
<b>OPTION 4</b>	+ MOST POSITIVE it's different from the SQ and b/c it was developed by an industry group	+ new closures provide additional opportunities for nearshore vessels - fewer opportunities for vessels that fish mostly in spring and for p/c vessels	+ new closures provide additional opportunities and could allow for more consistent supply of product to impacted communities - p/c prohibition affects shoreside support services (bait, ice, etc.)	- 25 DAS program impacts vessels that fish most in spring; p/c provision impacts public + area closures minimize disruption caused by SQ closures	+ increased opportunity in fishery minimizes need for alternative income; layover provisions could have negative and/or positive impact - potential to negatively impact vessels that fish most in spring

**Table 94 Summary of Potential Changes to Assessment Variables and Qualitative Comparison and Ranking of Gulf of Maine Alternatives Under Consideration**

\*"SQ" represents "status quo"; "b/c" represents "because"; "p/c" represents "party/charter."

#### 4.3.3.4 Georges Bank Options

All options under consideration in this framework adjustment include a Georges Bank cod trip limit of 2,000 pounds per day with a 20,000-pound maximum possession limit and no backstop mechanism. During the development of Framework 33, the Council considered five alternatives for area closures in addition to the Georges Bank cod trip limit. The social impacts of trip limits are briefly discussed in Section 4.3.3.1, and the social impacts of area closures are discussed in Section 4.3.3.2 of this document. At the final Framework 33 meeting, the Council selected Georges Bank Option 5 as the proposed action.

Georges Bank Closed Area Option 1 proposes a series of one-month closures from April – September based on the block/month combinations with the highest landings of cod. Option 1 is projected to result in a revenue loss between \$1.5-\$16.2 million (depending on assumptions about effort displacement, and this estimate assumes that scallop vessels will be prohibited from fishing in the closed areas). Of the five alternatives under consideration, Georges Bank Option 1 ranks third in terms of potential loss of revenue. The majority of revenue loss will be experienced by vessels that have accessed the proposed closed areas to fish. The April and July-September closures are located further offshore and will likely affect vessels that fish from ports like New Bedford. The proximity of these areas to the current Georges Bank closed areas suggests that a substantial proportion of the lost revenues may be from lost opportunities to fish for scallops. The April and May closures, on the other hand, are proposed to be adjacent to the eastern side of Cape Cod and will affect communities located along the outer Cape. Smaller vessels in ports like Chatham would lose their opportunity to fish during May and June, historically productive months.

Georges Bank Closed Area Option 2 proposes to close three offshore blocks year-round and one inshore block during May and June. Of the five alternatives under consideration, Option 2 ranks first in terms of potential revenue loss with a projected loss between \$13.9-\$38.9 million (if scallop vessels were prohibited from fishing in the area). Similar to the economic impacts, this option is more likely to produce negative social impacts than Option 1 because of the year-round nature of some of the closures. The vessels that fish in the area proposed for closure will be required to completely alter their business patterns and work routine. This includes finding new or different areas in which to fish and perhaps seeking alternative fisheries in which to participate. In addition, while the proposed year-round area closures are located offshore, they are not that far offshore and probably comprise a significant portion of the area in which vessels from the outer Cape (Chatham) fish. In addition, the area closures extend to the coast for two months.

While Georges Bank Closed Area Option 3 is not projected to produce the greatest economic impact, it may produce the greatest social impacts because of the nature and extent of the proposed closures. Option 3 closes an area that extends from the coastline of the outer Cape to Closed Area II on a year-round basis. This could preclude all fishing opportunities for small vessels located in Chatham and in other ports along the outer Cape. Some of these vessels may not have the ability to access open areas, especially during the winter months. This option distributes the potential negative impacts the *least* proportionally of all the closed area options under consideration.

Of the five alternatives under consideration, Georges Bank Closed Area Option 4 is projected to have the second lowest negative economic impact. This alternative includes a series of closures similar to Option 1. The proposed closures, however, are more evenly distributed between the inshore and the offshore and between the potentially affected fishing communities. The coast of the outer Cape is only closed for one month (June). The other proposed closures are located offshore so that all vessels have the opportunity to access fishing grounds on either side of the closed area.

The proposed action, Georges Bank Closure Option 5, is projected to result in the least economic impact (loss of revenues) of all the options under consideration. It proposes a one-month closure of a substantial portion of the fishing grounds located between the outer Cape, Closed Area I, and Closed Area II. While opportunities may be lost for many vessels during the month of May, the short-term nature of the proposed closure may allow vessels to compensate for their lost revenues during times when the areas are open or in other fisheries. A unique characteristic of Option 5 is that it was developed and proposed by a sector of the fishing industry. It is widely supported by the Georges Bank groundfish industry; fishermen feel strongly that protection of cod in the area during the month of May will benefit the resource more than a series of smaller closures throughout the spring and summer.

In summary, Table 95 compares the alternatives and characterizes the differences in the potential impacts of the various closure scenarios. Table 95 ranks the alternatives according to the degree of their expected economic and social impacts (the options are ranked from highest to lowest with “1” meaning that the option is likely to produce the greatest impact).

	Negative Economic Impact	Negative Social Impact	Possible Fleet Dislocation?	Potential Impact on Community Infrastructure?	Possible Industry Support?
<b>OPTION 1</b>	<b>3</b>	<b>3</b>	<b>3</b> SOME, during May and June; also possible dislocation for scallop vessels	<b>3</b> Loss of product during summer months	<b>3</b> More than 3 and less than 5
<b>OPTION 2</b>	<b>1</b>	<b>2</b>	<b>2</b> YES, for vessels that fish in area proposed for year-round closure	<b>2</b> Potential loss of product for ports on outer Cape	<b>4</b> More than 3 and less than 1
<b>OPTION 3</b>	<b>2</b>	<b>1</b> b/c of year-round closures	<b>1</b> YES, for boats in Chatham and the outer Cape, especially small boats	<b>1</b> YES, for ports along the outer Cape	<b>5</b> The least
<b>OPTION 4</b>	<b>4</b>	<b>4</b>	<b>4</b> Not likely, area closures are widely distributed; possible dislocation for scallop vessels	<b>5</b> Not likely	<b>2</b> More than all except for 5
<b>OPTION 5*</b>	<b>5</b>	<b>5</b>	<b>5</b> Not likely, area closures are short-term	<b>4</b> May only	<b>1</b> YES, the most

**Table 95 Comparison of Georges Bank Closed Area Alternatives**

**\*Option 5 represents the proposed action.**

**The options are ranked according to their likely impact with “1” signifying the most impact and “5” signifying the least impact.**

#### **4.3.3.5 Other Measures**

In addition to the options to address Gulf of Maine and Georges Bank cod, Framework 33 proposes the following:

- Requirement for party/charter vessels to obtain an exemption certificate to fish in any or all of the Gulf of Maine closed areas; enrollment is for a minimum of three months, and vessels that enroll are prohibited from using any DAS while in possession of the certificate.
- Haddock trip limit of 3,000 pounds per day with a 30,000-pound maximum possession limit, including the authority for the Regional Administrator to adjust the trip limit to ensure that 75% of the TAC is landed
- Modification of the Large Mesh Permit Category to change the minimum mesh size from eight to seven-inches, to adjust the increase in DAS from 36% to 25%, and to allow vessels to exit the category after one month.

The social impacts of the party/charter enrollment program are likely to be minimal, primarily because this provision does not restrict or limit access to the Gulf of Maine closed areas for party/charter vessels. Those vessels that are predominantly party/charter vessels (more than 90% of their fishing activity, for example) and that traditionally fish in the Gulf of Maine closed areas are not likely to be affected by the requirement to obtain an exemption certificate. Only those vessels that fish both commercially and in the party/charter sector may be required to sacrifice revenues from one or the other for a three-month period. The economic analysis indicates that revenues on very few vessels would be negatively impacted by this provision. The social impacts of this provision, therefore, are likely to be minimal.

The Council is proposing adjustments to the haddock trip limit to reduce the potential for discards during the May-September period. The initial trip limit is therefore proposed to be higher than it was during the last fishing year. The social impacts of trip limits are generally discussed in 4.3.3.1. This proposed adjustment to the trip limit is not expected to have a measurable impact on the fishing mortality rate for haddock and is, effectively, “conservation neutral.” In turn, to the extent that the proposed trip limit adjustment minimizes and/or reduces regulatory discarding, positive social impacts are predicted to result.

Modifying the Large Mesh Permit Category is intended to provide vessels with more incentive to elect into this category and use a larger mesh to fish for multispecies. The vessels that elect to enroll in the program weigh the costs and benefits of purchasing a new groundfish net and receiving 25% more DAS. It is assumed that the vessels that elect into this category do so because, in the long run, the economic benefits of 25% more DAS outweigh the costs of purchasing a new net. The magnitude and extent of the social impacts resulting from the proposed modifications will depend on the number of vessels that enroll in the Large Mesh Permit Category during the 2000-2001 fishing year. This may prove to be a viable option for many vessels that are facing decreases in revenues from the other Framework 33 management measures. If a significant number of vessels choose to enroll in this category, this provision could serve to mitigate many of the negative social impacts resulting from inshore area closures and low trip limits for Gulf of Maine cod. In addition, larger mesh will increase escapement for juvenile groundfish and could ultimately speed the recovery of the Gulf of Maine cod and other groundfish stocks (depending on how many vessels use the larger mesh). The long-term social and economic impacts of a rebuilt commercial resource are positive, and as the conservation objectives of the plan are reached more quickly, short-term negative social and economic impacts are minimized.

#### **4.3.4 References**

Aguirre International. 1996. *An Appraisal of the Social and Cultural Aspects of the Multispecies Groundfish Fishery in New England and the Mid-Atlantic Regions*, a report submitted to the National Oceanographic and Atmospheric Administration.

Amendments 5, 7, 9, and 12 to the Northeast Multispecies Fishery Management Plan (NEFMC).

Barrow, C.J., 1997. *Environmental and Social Impact Assessment: An Introduction*. Arnold/Hodder Headline, London. x + 297 pp.

Burdge, R.J., 1998. *A Conceptual Approach to Social Impact Assessment (Revised Edition)*. Social Ecology Press, Madison, WI. vi + 281 pp.

LeFevre, L.V. and Butler, M.J. *The Northeast Multispecies Fishery Management Plan and Gulf of Maine Cod: A Case Study of Recent Management Actions*. Fall 1999 (work in progress).

LeFevre, L.V. and Butler, M.J. *Request for Budget (RFB): Assessing the Cumulative Social Impacts of Recent Framework Adjustments to the Northeast Multispecies FMP*. Fall 1999 (work in progress).

NOAA-National Marine Fisheries Service. "Guidance for Social Impact Assessment", memorandum distributed to technical staff of fishery management councils, January 1999. 31 pp.

Pollnac, Richard B. and Littlefield, S.J. 1983. Sociocultural Aspects of Fisheries Management. *Ocean Development and International Law Journal*, 12:3-4, p. 209-246.

## **5. Applicable law**

### **5.1 Magnuson-Stevens Act (FCMA)**

The Magnuson-Stevens Act, implemented Oct 11, 1996, resulted in some major changes to the standards by which all Councils must manage the fisheries. Perhaps the most significant of these changes is the national goal of achieving maximum sustainable yield (MSY) for all stocks, and for rebuilding overfished stocks to biomass levels that can produce MSY on a continuing basis. This new requirement has taken several years to implement, primarily because the NEFMC has had to first revise all overfishing definitions to comply with the new standard, conduct assessments of all stocks to determine the status relative to the new overfishing definitions, and the modify the management plans to achieve the stock rebuilding that is necessary in most cases. In the meantime, the NEFMC has had to meet its existing regulatory requirements established under Amendment 7, including the conducting of annual and periodic adjustments to the plans to achieve the Amendment 7 rebuilding goals.

The Council's revised the overfishing definitions for the multispecies stocks in Amendment 9 which was submitted on October 9, 1998. NMFS published the proposed rule on March 23, 1999 and the final rule on October 15, 1999. The SAW's Northern Demersal Working Group completed updated assessments of 11 of the multispecies stocks in August, 1999, providing stock status relative to the new overfishing definition reference points. In light of this situation (both Amendment 7 goals and Amendment 9 overfishing definitions being in effect simultaneously), the Chairman of the MSMC requested guidance from the Council for the development of the 1999 MSMC Report, including management measures for the 2000 fishing year. The following is excerpted from a letter the Council Chairman sent to the MSMC Chairman in response:

*the Council is in a transition period between a management policy under the Amendment 7 rebuilding plan and management under the revised goals of Amendment 9*

*overfishing definitions. The full environmental impact analysis of management measures designed to achieve Amendment 9 goals, including biological, habitat, economic and social impacts, will be done in Amendment 13.*

*Therefore, for this year's annual adjustment, the Council requests that the MSMC provide catch targets (TACs) calculated on the Amendment 9 control rules and, for the five stocks with specific goals in Amendment 7, TACs at the  $F_{0.1}$  standard. You should also provide the target TAC based on  $F_{max}$  for Gulf of Maine cod to comply with the specific goal set by Amendment 7 for this stock. The Multispecies Monitoring Committee recommendations for management measures should be based on achieving the Amendment 7 objectives, with appropriate discussion and comment on how these measures relate to the Amendment 9 control rule objectives.*

*As for guidance on interpretation of the Amendment 9 control rules, the Council recognizes that those rules provide fishing mortality targets based on equilibrium stock conditions. Current conditions, however, may vary significantly from that theoretical basis, requiring a recalculation of the target fishing mortality rates that will rebuild the stocks within the prescribed time frame of five or ten years, depending on current biomass levels relative to  $B_{msy}$ . Consistent with National Standard 2, requiring the use of the best scientific information available, I recommend the MSMC use the information provided by the Northern Demersal Working Group to calculate the fishing mortality rate that rebuilds overfished stocks in five or ten years as appropriate. You should, therefore, use the rebuilding time period as the guide, not the stated equilibrium fishing mortality rate to calculate target allowable catch levels.*

This framework, and the accompanying MSMC Report are transitional between the Amendment 7 and Amendment 9 (SFA) management programs.

### **5.1.1 Consistency with National Standards**

Section 301 of the Magnuson-Stevens Act requires that regulations implementing any fishery management plan or amendment be consistent with the ten national standards listed below.

- 1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry. The proposed action achieves the goals established by Amendment 7 to stop overfishing and rebuild stocks of cod, haddock and yellowtail flounder. The target TACs for these stocks represent optimum yield in that they provide for rebuilding of overfished stocks. In developing the management measures for this framework action, the Council considered updated information on 11 of the multispecies stocks which it used as guidance in selecting the proposed action. As noted in the preface to this section, the Council is proceeding with Amendment 13, to expand the stock-rebuilding program to all stocks in the multispecies complex, and to bring the rebuilding programs into compliance with the new overfishing definitions established by Amendment 9.*
- 2. Conservation and management measures shall be based on the best scientific information available.*

This action is based on information contained in the annual Multispecies Monitoring Committee Report, including updated assessments of 11 groundfish stocks completed in August, 1999. While these assessments consider catch data through 1998, the Council has also considered landings data provided by NMFS for the current fishing year. In the case of GOM cod, particularly, the Council considered analysis provided by the MSMC that concluded that the fishing mortality rate has declined from the 1998 level estimated in the assessment to a level that is consistent with the current plan objectives. As new information becomes available, the Council has a process in place to make timely adjustments as needed.

3. *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. The FMP, and more specifically this framework action, contains measures that are both stock-specific, such as cod and haddock trip limits, and measures that impact the broader grouping of related stocks, such as DAS limits, minimum mesh size and area closures. The stock-specific management measures apply throughout the range of the target stocks, while the broader measures apply on all vessels engaged in fishing for regulated species.*

4. *Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.*

The proposed measures do not discriminate between residents of different states. The Council recognizes, however, that measures to conserve stocks that are distributed predominantly inshore may have a greater impact on inshore vessels and the ports bordering the affected areas. While vessels that have depended on the stocks in need of rebuilding, will be most affected by the conservation measures, the Council does not consider the differential impact to be the result of an allocation of fishing privileges by the management plan, but the consequence of individual circumstances. It has worked closely with the affected public to develop a set of measures that fairly and equitably distributes the burden of the rebuilding program across a broad segment of the industry while still achieving the needed conservation.

5. *Conservation and management measures shall, where practicable consider efficiency in the utilization of fishery resources; except that not such measure shall have economic allocation as its sole purpose.*

One of the Council's most important considerations in developing the measures in this framework has been to provide opportunity to the widest range of affected vessels to continue to fish without compromising the conservation goals of the plan. For example, it did not adopt the alternatives that would have reduced days at sea, primarily because it would have unnecessarily placed some of the cost of rebuilding on vessels that are not fishing on the stocks in need of immediate conservation. The Council also considered, but did not adopt alternative DAS counting methods and a layover-day proposal because of the distribution of impacts and the inherent inefficiencies of those measures. The adjustment to the haddock trip limit also promotes efficiency in the utilization of that resource without compromising the

rebuilding program.

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

The Council considered extensive public input from affected industry sectors in its development of the proposed action. Where possible within the conservation requirements, it has sought ways to maximize opportunity for vessels to engage in other fisheries, taking into account the different gear types and the characteristics of different fleet sectors. This proposed action continues the FMP strategy of gear-specific management measures and exceptions that includes, but is not limited to access to closed areas for gear not capable of catching groundfish, exemptions to the minimum mesh size for fisheries with a demonstrated minimal impact on regulated species, different DAS counting for Day Gillnet vessels, inshore Gulf of Maine roller gear restrictions, and different management measures for recreational, party/charter and commercial vessels.

7. *Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.*

The Council considered the costs and benefits of a range of alternatives that would achieve the conservation goals of the plan. It considered costs to the industry, particularly in terms of foregone revenues and costs of compliance, and, where possible, enforcement and administrative costs in selecting the proposed action. In some cases, administrative and enforcement cost estimates are not quantitative but are based on the qualitative comments of affected agencies. The Council seeks to avoid unnecessary duplication by considering the impacts of proposed measures on all stocks in the multispecies complex that are in need of rebuilding. In other words, the Council has considered the collateral benefits for other stocks when selecting measures designed to protect or rebuild specific stocks.

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

During the development of Framework 33, the Council considered the importance of fishery resources to affected fishing communities in order to provide for their sustained participation in the multispecies fishery and to minimize adverse impacts resulting from the management adjustment. The Council selected management measures from a range of alternatives that were analyzed for their potential biological, economic, and social impacts. Within the range of alternatives that were analyzed and expected to achieve the biological objectives of the management plan, the Council chose measures that are intended to minimize economic dislocation for affected vessels and negative short-term social impacts on affected fishing communities. On several occasions, the Council has noted that communities most dependent on stocks like Gulf of Maine and Georges Bank cod will likely experience the most negative short-term impacts from the management measures, but these are the same communities that are likely to benefit the most over the long-term from rebuilding the resource to maximum sustainable levels.

Several components of the proposed action demonstrate the Council's intent to maintain consistency with National Standard 8. First, the measures that the Council selected for Framework 33 are very similar to status quo management measures (Frameworks 26, 27, and 31 collectively). Continuing the current management strategy with only minor modification should minimize social disruption occurring in affected fishing communities upon implementation. In turn, the social impacts resulting from the action proposed in Framework 33 are not likely to be significantly different from the status quo. Second, Framework 33 proposes a 400-pound trip limit for Gulf of Maine cod, which represents an overall increase from the Gulf of Maine cod trip limits during most of the 1999-2000 fishing year (100 pounds, 30 pounds, for example). Low trip limits often produce an extremely socially undesirable consequence: regulatory discarding. The Council's decision to implement a 400-pound Gulf of Maine cod trip limit without a mechanism for the Regional Administrator to lower that trip limit (but with other equivalent measures) illustrates its commitment to minimizing adverse impacts of these management measures on affected fishing vessels and communities.

Third, the Council selected a "backstop" that is likely to produce less severe negative social impacts than the other "backstop" alternative under consideration. The Council considered the costs and benefits of two Gulf of Maine "backstop" alternatives before selecting the proposed action in order to both maximize the effectiveness of the measure and minimize its potential negative impacts on affected vessels and communities. The "backstop" alternative that was not selected would have produced disproportional negative impacts on smaller vessels and affected fishing communities, especially those located along the outer Cape.

9. *Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.*

The proposed action includes an increased haddock trip limit during the May – September period, and a continuation of the 400 pound per day GOM cod trip limit implemented under Framework 31 specifically to reduce the potential for regulatory discards. The Council also proposes to substitute additional area closures for the current provision that grants authority to the Regional Administrator to reduce the GB cod trip limit by notice action. It is doing so to forestall a situation on Georges Bank similar to what occurred in the Gulf of Maine when the trip limit was reduced to levels that resulted in high discard rates being reported. The Council also proposes to increase the incentive for trawl vessels to fish with nets whose mesh is larger than the minimum required size by modifying the Large Mesh Permit Category conditions. If participation in this program increases, there will be a reduction in regulatory discards due to the minimum fish size rules.

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

The Council is acutely aware of the safety implications of its decisions, both through extensive public comment and the practical experience of many of its members. Notwithstanding the restrictive measures that are needed to achieve the plan goals, the Council has chosen measures that minimize the safety impacts, and do not require unsafe activities. The Council has sought, and continues to seek to provide as much opportunity as possible for vessels within the constraints of the conservation program so that fishermen are not put in the

position of having to take risks just to survive financially. It considers rebuilding the stocks essential to minimizing the need for fishermen to have to make such decisions.

### **5.1.2 Other FCMA requirements**

Section 303 (a) of FCMA contains 14 required provisions for FMPs. These are discussed below. Any fishery management plan that is prepared by any Council, or by the Secretary, with respect to any fishery, shall--

*(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the national standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;*

See Section 3.0 for a description of the measures contained in the amendment, and Section 5.1.1 for a discussion of the amendment's consistency with the national standards.

*(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;*

The Environmental Assessment contained in this document (Section 5.2.1) supplements the documents submitted with preceding amendments (particularly Amendment 5, 7 and 9), in forming the description of the fishery. There is no foreign fishing for species covered under this FMP, nor are there any Indian treaty fishing rights.

*(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;*

Amendment 9 contains proposed overfishing definitions based on achieving maximum sustainable yield, and a revised specification of optimum yield. The report of the Overfishing Definition Review Panel in Appendix II of that amendment contains a complete description of the information used in calculating the target and limit reference points. The 1999 MSMC Report (Appendix III of this document) contains rebuilding projections for 11 groundfish stocks based on updated assessments at fishing mortality targets in both Amendment 7 and Amendment 9 overfishing definitions. The target TACs for the critical stocks represent optimum yield for those stocks which are the primary focus of the rebuilding plan. The Council has initiated Amendment 13 to develop rebuilding plans consistent with the new overfishing definitions for all of the multispecies stocks.

*(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3), (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;*

Based on the annual Multispecies Monitoring Committee analysis of DAS utilization rates, fishing mortality rates and target TACs, the total capacity of the fleet exceeds that needed to harvest optimum yield at current stock levels and fishing mortality targets designed to rebuild the resource. Consequently, no portion of the allowable catch is available for foreign fishing. However, much of the capacity, in terms of permitted vessels, is inactive or only uses a fraction of its allotted fishing effort (DAS). As the stocks rebuild, that now-excess capacity will provide the means to harvesting the available resource competitively, efficiently and safely. The Council has an annual review and adjustment process to manage the effort levels and keep them within the target range and it has established a Capacity Committee to review of current fishing capacity and future capacity under rebuilt stock conditions. The Council has also indicated its intent to consider alternatives for managing fleet capacity in Amendment 13 currently under development.

*(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;*

Section E.6.1.1 of Amendment 9 contains a discussion of the FMP's data considerations and the Council's participation in the Atlantic Coastal Cooperative Statistics Program (ACCSP) and in the stock assessments. The Council has initiated efforts to organize and compile all of the data requirements for managing the stocks in a manner consistent with the Sustainable Fisheries Act. These efforts include calling on NMFS to prepare an annual publication of a Stock Assessment and Fishery Evaluation (SAFE) Report, activation of the Science and Statistical Committee and Social Sciences Advisory Committee and continued participation in the Stock Assessment Workshop Steering Committee.

*(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;*

The Council has carefully considered the impacts of needed conservation restrictions on vessels that are constrained because of size or other factors in their ability to fish offshore. This has been one of the most difficult issues in the development of the GOM cod rebuilding strategy because the area where those measures will be most effective in achieving rebuilding are inshore areas

where the cod aggregate, especially to spawn, and where the highest cod landings are observed. It has similar concerns with the small vessel fleets that fish on Georges Bank cod to the east of Cape Cod. It has worked closely with the industry to develop alternatives that minimize these impacts, and it has a framework adjustment process for making changes as needed to address safety consistent with National Standard 10 while maintaining fair and equitable access to the fishery within the limitations of the conservation program.

*(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;*

Pursuant to 50 CFR 600.920 of the EFH Interim Final Rule, the Council prepares an EFH Assessment for each proposed fishery management action. The EFH Assessment includes a description of the proposed action, an analysis of the effects of the proposed action, the conclusions of the Council regarding the proposed action, and proposed mitigation, if necessary. The EFH Assessment can be found at Section 4.1.9 of this document.

*(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

The Council is working closely with NMFS to coordinate the reporting of scientific information in a timely manner so it coincides with the annual plan review and adjustment process. See discussion under item 5 above.

*(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on--(A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;*

The Environmental Assessment contains analysis and discussion of the impacts of the proposed action on the human environment, including fishing communities. The Council developed measures in this framework in consultation with the Mid-Atlantic Council through their participation on the Groundfish Committee and attendance at Council meetings.

*(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;*

The revised overfishing definitions in Amendment 9 specify both biomass and fishing mortality criteria for evaluating a stock's status. The Overfishing Definition Review Panel Report in Appendix II to Amendment 9 contains a full description of the analysis and methodology used to establish these criteria. The FMP contains measures to stop overfishing and an annual review and adjustment process to keep the rebuilding plan on track. The Council has initiated the development of Amendment 13 to address rebuilding programs for all overfished stocks in the FMP.

*(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority--*

*(A) minimize bycatch; and*

*(B) minimize the mortality of bycatch which cannot be avoided;*

The Vessel Trip Reports (logbooks) mandatory under the FMP since 1994, require fishermen to report discards. In conducting the stock assessments, NMFS uses information provided in the VTR as well as information gathered in the Northeast Fisheries Observer Program. In recent years, assessment scientists have expanded the analysis of discards in the stock assessments for some species. The Council and NMFS are both participating in the Atlantic Coastal Cooperative Statistics Program which is a long-term effort to improve the collection and utility of fisheries data (including bycatch).

The FMP contains a number of measures that directly or indirectly minimize bycatch or bycatch mortality as discussed in the submission documents for previous amendments and framework adjustments, for example, minimum mesh size and exempted fishery programs based on minimum bycatch standards for regulated species. The Council recognizes that low trip limits have caused discards and in such cases (specifically GOM cod) has increased the trip limit and provided for the landing of limited overages without compromising the rebuilding program for the target stock by substituting alternative conservation measures. In this framework, the Council also proposes to substitute a Georges Bank area closure for an existing provision that could result in reducing the cod trip limit during the fishing year (which may result in increased discards), and has increased the haddock trip limit while maintaining adequate backstop provisions to prevent exceeding the TAC. The increased incentive for otter trawl vessels to enroll in the Large Mesh Permit Category may also reduce discards.

*(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and*

*include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;*

The FMP contains no recreational fishery catch-and-release programs.

*(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors; and*

Amendment 9 contains several sections that update the FMP in the context of this requirement: Appendix III describes the social and cultural aspects of the multispecies fishery; Section E.6.4. contains additional descriptions of the halibut fishery and recreational fishery, including trends in landings; and Appendix II, the Report of the Overfishing Definition Review Panel, describes the long-term landings history by species for all of the stocks in the multispecies fishery. Furthermore, Amendments 5 and 7 to the Multispecies FMP contain detailed descriptions of the commercial recreational and party/charter sectors participating in the fishery which provides additional historical perspective. Additional information describing the recreational fishery is contained in Appendix IV of this document. In addition to periodic revisions or additions to the baseline information in individual framework documents, the Council will fully update the descriptions of the fisheries in the Environmental Impact Statement for Amendment 13.

*(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

The Council has incorporated all sectors of the fishery into the FMP. For this framework, it has reviewed recreational and party/charter landings and determined that rebuilding program has been equitably distributed across commercial and recreational sectors. It will continue to monitor the relative impacts on different fishery sectors and make adjustments as needed.

## **5.2 National Environmental Policy Act (NEPA)**

The Council conducted an analysis of the environmental impacts of the stock rebuilding plan under Amendment 7. The Final Environmental Impact Statement (FSIES) indicated that the impacts of Amendment 7 would be significant, particularly the positive biological and long-term economic impacts of rebuilding the stocks. The proposed action is intended to modify the management measures to achieve the objectives and purposes of Amendment 7. The impacts discussed in this document are consistent with those that were expected under Amendment 7, as the measures are modifications to the Amendment 7 management program which failed to fully achieve its stated purpose.

### **5.2.1 Environmental Assessment**

Section 2.1 of this document contains a discussion of the purpose and need for the proposed action. Section 3.0 contains a description of the proposed action and alternatives, including the no-action alternative. Section 4.0 contains an analysis of potential impacts.

In developing the proposed measures and in reviewing the analysis of impacts contained in this Environmental Assessment, the Council has consulted with NMFS, the Mid-Atlantic Fishery Management Council, Atlantic States Marine Fisheries Commission and the state marine fisheries agencies (New England states) through their participation in Council and Groundfish Committee meetings. The Council has also informed the interested public of the proposed action and review of environmental documents through notice in the *Federal Register* and by mailing of Council meeting notices and agendas to approximately 1,650 persons. About 850 interested parties receive notices of the Groundfish committee meetings.

### **5.2.2 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 the ongoing Amendment 7 stock-rebuilding program. As such, the Council expects that the proposed action will improve the long-term productivity of the resource. The Council considers the proposed action to be consistent with National Standard 1 of the Magnuson-Stevens Act, which requires fishery management plans to achieve maximum sustainable yield. It has also initiated development of Amendment 13 which will implement broad stock rebuilding programs for all overfished stocks, and provide an opportunity to update the environmental documents supporting the FMP, including updated stock rebuilding and yield projections for all species in the FMP.

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

As discussed in Section 4.1.9 of this document, the alternatives and actions proposed in this framework adjustment will not increase any adverse impacts on essential fish habitat (EFH) resulting from fishing activity. The Council does not expect that the proposed action will cause or allow substantial damage to ocean and coastal habitats generally, because the measures consist primarily of those that are protective of habitat (area closures and gear reductions) or those that are neutral on habitat (trip limits).

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

The proposed action will probably not adversely affect public health, as no public health issues have been identified. The action is consistent with National Standard 10 of the Magnuson-Stevens Act which requires fishery management plans to promote safety. In developing management measures the Council receives significant comment from affected members of the industry regarding the safety implications of various alternatives that it considers in deciding on a final action.

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

As discussed in Section 4.1.8, the Council does not expect that the proposed action will have

a negative impact on endangered or protected species.

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?*

As discussed earlier, the proposed action is part of the ongoing Amendment 7 stock rebuilding program and, as such, is designed to have a positive effect on the fishery resource. Considering the status of the stocks that are the focus of this action, particularly Georges Bank and Gulf of Maine cod, taking no action would have a far more adverse impact on the resource than the proposed action. While some effort shifting may result in short-term adverse impacts on some stocks as vessels seek alternative fisheries, these impacts are likely offset by the cumulative benefit of closed areas, mesh size increase and roller-gear limitations that will accrue to target stocks and related species.

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 Northeast Multispecies 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**

### **5.3 Regulatory Impact Review**

This section provides the information necessary for the Secretary of Commerce to address the requirements of Executive Order 12866 and the Regulatory Flexibility Act. The framework document contains all the elements of the RIR/RFA, and the relevant sections are identified by reference to the document.

The purpose and need for management (statement of the problem) is described in Section 2.0 of this document. The proposed action is described in section 3.1 of the amendment document. Alternatives to the proposed action are also summarized in section 3.2. The economic impacts are described in section 4.2 and summarized below under the discussion of how the proposed action is characterized under Executive order 12866 and the Regulatory Flexibility Act.

#### **5.3.1 Executive Order 12866**

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

- (a) The Framework 33 proposed action is developed to reduce the fishing mortality rates on Georges Bank and Gulf of Maine cod stocks, by 36 percent and 56 percent respectively from their 1998 levels. This action is the fourth iteration of the annual plan review and adjustment process established by Amendment 7 to ensure that rebuilding goals of the plan are met on a continuing basis.

As projected by the cost-benefit analysis in the FSEIS of Amendment 7, in the short-term, the proposed regulations will reduce gross revenues, profits, and crew income in the fishing industry. Over the long-term, however, the net impacts on the economy will be positive.

The short-term impacts of the Framework 33 proposals could be summarized as follows:

- The proposed Gulf of Maine cod measures include the continuation of the closures contained in Frameworks 27 and 31 (status quo), and the current trip limit of 400 pounds per days-at-sea implemented under Framework 31. As a result, no change in revenues and costs are expected with these closures and trip limits from the status quo levels for the fishing year 2000.
- The proposed action also extends Western GOM Closed area for one additional year, from May 2001 to April 30, 2002. Since this closure was scheduled to end on April 30, 2001, the one-year extension will reduce the revenues that could be potentially derived from fishing in this area if the scheduled opening went into effect in the 2001 fishing year. The potential revenue loss will range from \$1.8 million with a 75 percent effort shift to other areas to \$7.4 million if there is no effort displacement. It is more reasonable to expect, however, that vessels will shift their effort, and recover some part of the lost revenues by fishing in other areas. It also should be emphasized that if this area was opened on May 2001, other restrictions on catch and effort would likely be needed to provide an equivalent cod conservation in order to meet GOM cod fishing mortality objectives.
- In addition, the proposed action would close the Cashes Ledge Closed Area in November and Blocks 124 and 125 in January if 50 percent of the TAC were landed by July 31, see Figure 2. These closures would have negative economic impacts on vessels by reducing the revenues from all species derived from these areas. Specifically, if half of TAC were indeed reached by July 31, the proposed closures would reduce the fleet revenues by \$161,600 with a 75% effort displacement and by \$646,500 with no effort displacement.
- The proposed Georges Bank cod measures include closure of the area shown in Figure 3 in May. This closure will likely cause the total revenues of the vessels that use groundfish gear, that is, otter trawls, gillnets and hook vessels, to decline, by \$0.3 million if there is total effort displacement to other areas or up to \$4.1 million if there is no effort shift to other areas. The actual impacts will lie somewhere between these two extremes, since some vessels will probably recover a part of the lost revenues by fishing in other areas.
- Party and charter vessels would be required to obtain an exemption certificate from NMFS to fish in any of the Gulf of Maine closed areas. A limited access vessel in the exemption

program would be prohibited from fishing on a DAS while in possession of the certificate. Under this action, only one vessel would lose more than 5 percent of its annual income, and the loss is estimated to be about 7 percent.

- Limited access vessels would be prohibited from fishing under a DAS while taking passengers for hire. This option would close a perceived “loophole” in the regulations that allows party/charter vessels that possess a limited access permit to fish for regulated species with the lower minimum fish size that applies on commercial vessels, and to sell their catch. Party/charter vessels that do not have limited access permits do not have this option. Although this option may potentially have negative impacts on the revenues, the extent of these impacts could not be assessed quantitatively at this time.
- The proposed increase in the haddock trip limit will not likely have a measurable impact on the fishing mortality rate from the status quo. The proposed action reduces the potential for discards during the May-September period with a conservation impact approximately equivalent to the status quo. Since discards are reduced, revenues may increase, although the extent of this increase could not be quantified at this time.
- For otter trawl vessels fishing in the revised Large Mesh Permit Category, the reduction in the minimum mesh size from 8 inches to 7 inches may have some positive impacts on revenues by itself. The potential increase revenues is offset by a reduction in the increased DAS allocated to participating vessels fishing in this category, from 36 percent to 25 percent. Vessels participating in this program will also have to incur the cost of purchasing a large-mesh trawl net. However, since this is a voluntary program, presumably vessels will not participate unless it is projected to have a positive net economic impact at the vessel level.

The proposed measures contained in this framework are designed to achieve the biological objectives of Amendment 7 at a minimum economic cost to the industry whenever possible without compromising the conservation goals. The proposed measures will reduce the landings and revenues in the short-term, but will contribute to stock rebuilding, and therefore, will increase the net economic benefits in the long term. For these reasons, the proposed action will not adversely affect in a material way the economy, productivity, competition and jobs.

Even with the unrealistic assumption of no effort displacement, the total loss in revenues from all measures will not exceed \$12.1 million including the loss from the extension of Western GOM Closed area (\$7.4 million) from May 2001 to April 30, 2002. The actual economic impacts will be less than this amount, however, as effort is shifted at least partially to other areas and months. For example, with a 50 percent effort displacement, the estimated total revenue loss will not exceed \$5.7 million. If the effort displacement is only partial, the variable costs of vessels will also decline. As a result, the decline in revenues net of variable costs will be less than estimated even with no effort displacement. In addition, the ex-vessel prices may increase as a result of reduced landings from closures, offsetting some part of the revenue loss. Therefore, the proposed action will not have an annual effect on the economy of more than \$100 million.

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 area closures and trip limits will not affect safety or public health.

- (b) 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 areas and the fisheries.
- (c) 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.
- (d) The proposed action does not raise novel legal or policy issues. Regulations regarding area closures, trip limits, and gear requirements have already been used to manage fisheries in the Northeast.

### **5.3.2 Regulatory Flexibility Act (RFA)**

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. 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, the Council has carefully considered which groups will be affected by the proposed action, possible alternatives to achieving the plan’s conservation objectives, and how to minimize negative regulatory impacts. See Sections 3.0, 4.2, and 4.3 for the discussion of alternatives and their impacts on vessels of different sizes and gear types. The Council also considered a large amount of input from the regulated entities and will evaluate the effectiveness and impacts of the proposed action on a continuing basis.

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 groundfish industry directly affected by the proposed action is composed primarily of small business entities. In 1998, about 847 otter trawls, 460 gillnet and 289 vessels participated in the Northeast fishery, including the Gulf of Maine and Georges Bank areas. The average annual revenues of these vessels were less than \$3 million for the period 1994-1998.

The 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 multispecies 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 ("threshold analysis"):

- 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 Initial Regulatory Flexibility Analysis and threshold analysis are not required. The information needed for such analyses are presented in 4.2.5, however, in the context of the economic impacts on vessels and other small business entities.

#### **5.4 Endangered Species Act (ESA)**

Section 7 of the Endangered Species Act 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. The Council has concluded that the proposed action may affect, but is not likely to jeopardize the continued existence of any endangered and threatened species. Consultation on the Multispecies Plan in 1996 resulted in a jeopardy finding for the northern right whale.

Consultation was reinitiated in 1997 to incorporate the Atlantic Large Whale Take Reduction Plan (ALWTRP) as an expanded reasonable and prudent alternative. Implementation of that plan, in conjunction with simultaneous right whale recovery actions taken by NMFS and other agencies, is expected to remove the threat of jeopardy to the northern right whale represented by the multispecies fishery. The Council does not anticipate any adverse modification to right whale critical habitat as a result of the proposed action. Should activities associated with the Multispecies FMP change significantly or new information become available that changes this determination, the Council will reinitiate consultation.

#### **5.5 Coastal Zone Management Act (CZMA)**

The Council has reviewed the coastal zone management programs for states whose coastal waters are within the range of areas affected by the proposed actions, including: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware and Maryland. It has determined that the proposed action is consistent with the CZM programs of

those states and has sent a notification of this determination, along with a copy of the amendment document, for their concurrence. Copies of the correspondence are on file at the Council office.

#### **5.6 Paperwork Reduction Act (PRA)**

Materials and analysis required under the PRA are submitted under separate cover.

#### **5.7 Marine Mammal Protection Act (MMPA)**

The Council has reviewed the impacts of Framework 33 on marine mammals (Section 4.1.8) and concludes that this action is consistent with the provisions of the MMPA and will not alter existing measures to protect species likely to inhabit the management unit. Overall, positive benefits may accrue to species inhabiting the areas affected by the proposed measures.

