

FRAMEWORK ADJUSTMENT 30

to the

NORTHEAST MULTISPECIES FISHERY MANAGEMENT PLAN

To achieve plan objectives for Georges Bank cod in 1999

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 protect Georges Bank cod under an ongoing rebuilding plan for northeast multispecies groundfish stocks. This action is part of the third annual adjustment under the 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 Council completed the first part of the process in January, 1999 and submitted the action as Framework 27, but was unable to complete development of measures to protect Georges Bank cod at that time.

The primary purpose of this annual adjustment process 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 by 22 percent for Georges Bank cod and by 56 percent for Gulf of Maine cod from 1997/1998 fishing mortality rates.

In developing the measures for this framework, the Council considered a range of alternatives, including a proposal made by a broad-based industry group after the framework process had been initiated. Procedurally, the Council had to initiate a new framework adjustment for this proposal to provide the public with adequate notice and opportunity for comment. The main component of the proposal is to require vessels to take four 30-day blocks out of the multispecies fishery. Since both the Groundfish Committee and the Industry Advisory Panel recommended adopting this proposal and recommended adopting measures as near to the start of the fishing year as practicable, the Council is taking a two-stage approach to meeting the plan objectives.

The first part of this strategy is the 30-day closed area contained in this framework, with a fall-back Georges Bank cod trip limit of 2,000 pounds per day/20,000 pounds maximum to take effect August 15 if the second framework is not implemented. The second part, Framework 31, which would require vessels to take 30-blocks out of the fishery, is currently undergoing analysis and public comment prior to the final Framework meeting scheduled for May 26 –27, 1999. Framework 31 may also contain other measures, such as eliminating the running clock in the Gulf of Maine cod trip limit program, increasing the cod minimum fish size to 21 inches and reducing the amount of gear allowed on hook and gillnet vessels fishing on Georges Bank.

The Council will continue to monitor the rebuilding plan to insure that its goals are met each year. Additionally, the Council has amended the FMP (Amendment 9 and Amendment 11, Essential Fish Habitat, and Amendment 12, small-mesh species) to bring it into compliance with the new and revised national standards in the Sustainable Fisheries Act. These amendments are in various stages of review and will become effective, pending approval by the Secretary of Commerce, in 1999. The Council also

has initiated the scoping process for Amendment 13. The amendment will implement rebuilding plans for stocks identified as overfished under the new overfishing definitions submitted in Amendment 9 and make other modifications to the FMP to address issues identified during the scoping process.

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

The Council has held three annual reviews resulting in five adjustments to address Amendment 7 rebuilding needs (Frameworks 20, 24, 25, 26 and 27). It held the final Framework 27 meeting on January 27-28, at which time it focused on the finalizing the severe restrictions necessary to achieve the plan objectives for Gulf of Maine cod. Due to a lack of time, however, it was unable to complete the work necessary to also reduce the fishing mortality rate on Georges Bank cod to the plan target level.

1.2.2 Multispecies Monitoring Committee Report

The Council established the MSMC to annually review the rebuilding plan, identify options as needed to achieve plan goals, and to set annual target total allowable catch levels (TACs) for the five focus stocks of cod, haddock and yellowtail flounder. So that sufficient time is available for the Council to develop and submit plan adjustments and for NMFS to review and implement regulations by the May 1 start of the fishing year, the MSMC must begin its review in early Fall. The MSMC met on the following dates in 1998:

- August 26
- October 21 & 27
- November 12-13.

As a result of this timetable, the MSMC must project the impacts of measures in effect for the current fishing year based on data from the first four or five months of the fishing year so that it can estimate the status of the stocks at the end of the year, calculate TACs and develop options to meet plan goals in the following fishing year. The MSMC completed its report on December 2 and formally presented it to the Council and public on December 9.

In summary, the MSMC noted the following:

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.

*The status of Gulf of Maine cod has continued to deteriorate. The fishing mortality rate is projected to increase slightly to 0.82 in 1998, and remains well above both the overfishing definition ($F_{20\%}=0.37$) and the Amendment 7 mortality target ($F_{Max}=0.29$). Recruitment is at record low levels and spawning stock biomass is projected to decline in 1998 to the lowest level ever observed. Biomass is projected to decline below $\frac{1}{4} B_{MSY}$ in 1999. The proposed control law recommends zero fishing mortality when biomass is below $\frac{1}{4} B_{MSY}$. Given the SARC 27 management advice based on the stock condition, continued high fishing mortality rates, poor recent recruitment and decline in the survival ratios (recruit/spawning stock biomass), the Amendment 7 **objective of F_{max} is no longer appropriate.***

The MSMC also examined the status of the other large mesh regulated species (white hake, pollock, redfish, American plaice, witch flounder, winter flounder, and windowpane flounder) through calendar year 1997 using research trawl survey indices, commercial landings and a relative exploitation index. Survey biomass is low for five stocks (white hake, pollock, American plaice, Southern New England winter flounder, and Southern New England windowpane) and low to medium for three stocks (witch flounder, Gulf of Maine/Georges Bank windowpane and medium for two stocks (Cape Cod yellowtail and redfish). Relative exploitation has declined for all species, except white hake and Southern New England winter flounder. Exploitation has remained remain flat for these species since 1991.

Target total allowable catches (TACs) were calculated for calendar year 1999 (January 1 1999 to December 31, 2000) based on MSMC projected stock sizes for January 1, 1999 and target fishing mortality rates. These target TACs are then assumed to be the target TACs for the fishing year (May 1, 1999 to April 30, 2000). The TACs assume that the 1998 Canadian quota for the three Georges Bank stocks will be carried over in 1999. The assumed Canadian quota was subtracted from the Total TACs for transboundary stocks to obtain the USA target TAC. Target TACs are found in Table1:

<u>Stock</u>	<u>1998 TAC</u>	<u>1998 landings</u>	<u>Projected</u> <u>1999 TAC</u>
Georges Bank cod	4700	6348	5354
Georges Bank haddock 4797	3394		5600
Georges Bank yellowtail	2145	1110	2725
SNE yellowtail	814	223	1115
Gulf of Maine cod (F_{MAX})	1783	4075	1340
Gulf of Maine cod ($F_{0.1}$) 1783	4075		782

Table 1 1998 projected landings (calendar year) and TACs for 1998 and 1999 (calendar year applied to fishing year) in metric tons for the 5 major groundfish stocks.

The TAC (for F_{MAX}) for Gulf of Maine cod represents a 67% drop from projected 1998 landings.

2. Purpose and need

2.1 Need for the adjustment

The purpose of the proposed action is to reduce the fishing mortality rate on GB cod by 22 percent in the 1999 fishing year from 1997/1998 levels based on the MSMC calculation after accounting for an expected 7.4 percent reduction in days-at-sea. SAW 27 projected that fishing mortality would have to be reduced about 30 percent, from $F_{98} = 0.26$ to the Amendment 7 target, without considering the expected DAS reduction. Under projected 1998 fishing mortality rates, the MSMC estimated GB cod landings of 8,338 metric tons (6,348 mt US, 1,900 mt Canadian) and SAW projected 9,400 metric tons stock-wide. Preliminary landings for 1998 are 8,754 mt (6,899 mt US, 1,855 mt Canadian), which is mid-way between the two projections.

SAW 27 gave the following advice on Georges Bank cod:

“Fishing mortality should be reduced from the current level ($F=0.26$, 21 percent exploitation) to substantially less than $F_{0.1}=0.18$ (Amendment 7 rebuilding target). Poor recruitment coupled with a truncated age structure from years of overfishing has decreased the potential for stock rebuilding at the current fishing mortality rate. Reducing fishing mortality will avoid declines in SSB and enhance the probability of long-term rebuilding. Low fishing mortalities will eventually lead to an expansion of the age distribution of the population and increase the likelihood of improved future recruitment”

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. the continuing evaluation of the plan.

2.2.1 Timing of the rule

The timing of the rule is relevant to the start date of the fishing year, May 1, and to the need to implement measures to reduce fishing mortality on GB cod at the earliest possible time. Based on the amount of time NMFS requires to review the framework document to determine that the proposed action meets the FMP objective and is consistent with other applicable law, publication as a proposed rule would delay effectiveness of the measures further beyond the start of the fishing year than is already likely. In fact, the annual framework adjustment process prescribes submission of the documents by February 1 to have regulations in place by May 1. However, at the final meeting for Framework 27, the Council focused its efforts on the developing a conservation program for GOM cod, and was unable to complete measures for GB cod without risking a delay in that much needed program. The Council is concerned that any further delay in the effectiveness of measures to reduce fishing mortality of GB cod would have a detrimental impact on the stock and force even more restrictive measures on the industry in the future.

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

This framework is an extension of Framework 27, to complete unfinished business regarding GB cod. The Framework 27 development process formally started with the December 9, 1998 Council meeting. At that initial meeting the MSMC gave its report on the status of the rebuilding plan, and the Council identified the basic options it would include in the document for analysis and public comment. Over course of the preceding year, however, the Council, Groundfish Committee and Groundfish Advisory Panel frequently discussed, in public meetings, the status of GOM and GB cod and the potential for additional restrictions to meet plan objectives. In August, SAW 27 issued its report advising the Council and the public that the fishing mortality rate on GB cod was above plan target levels.

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

DATE	MEETING	AGENDA/DISCUSSION
11/16/98	GF Committee	<ul style="list-style-type: none"> • Update on MSMC report and its implications for management in the 1999 fishing year
12/9-10/98	Council	<ul style="list-style-type: none"> • MSMC Report • Initial meeting for FW 27 • Final meeting for FW 26
12/15/98	GF Advisory Panel	<ul style="list-style-type: none"> • Review and advise on FW 27 options
12/16/98	GF Committee	<ul style="list-style-type: none"> • Review FW 27 options
1/25/99	GF Advisory Panel	<ul style="list-style-type: none"> • Review FW 27 analysis and advise on a preferred alternative
1/26/99	GF Committee	<ul style="list-style-type: none"> • Review FW 27 analysis and recommend a preferred alternative
1/27-28/99	Council	<ul style="list-style-type: none"> • Framework 27 final meeting
2/11/99	GF Committee	<ul style="list-style-type: none"> • Identify options for GB cod
2/24-25/99	Council	<ul style="list-style-type: none"> • Initial meeting for Framework 30
3/22-23/99	GF Committee and Advisory Panel	<ul style="list-style-type: none"> • Review Framework 30 options and recommend a preferred alternative
4/14-15/99	Council	<ul style="list-style-type: none"> • Final meeting for Framework 30

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 GB cod. While GB cod has begun to rebuild, at current fishing mortality rates, the SAW projects that the stock will actually decline in 2000, due largely to very poor recruitment. If fishing mortality is not reduced as soon as possible, there is a greater likelihood of stock decline in the near term, which would require additional restrictions on the fishing industry to achieve plan objectives. The fishing industry recognizes the need for immediate resource protection and has appealed for expeditious action to implement GB cod protection measures at the start of the fishing year when fishing activity is at its peak. The fishermen do not want to repeat events in the Gulf of Maine which resulted in a succession of increasingly restrictive measures to achieve the plan objectives as the GOM cod stock continued to decline.

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, such as they have done recently with Framework 26 to protect GOM cod.

3. PROPOSED ACTION AND ALTERNATIVES

Section 3.1 contains the measures approved by the Council for submission in this framework. Section 3.2 contains other alternatives that it considered but rejected.

3.1 Proposed action

The Council proposes a two-stage approach to address GB cod fishing mortality in the 1999 fishing year. The first stage would consist of measures proposed in this framework adjustment to implement a 30-day area closure upon effectiveness of the implementing rule, with a fall-back cod trip limit that would take effect on August 15 in the event the second stage is not implemented. The primary measure for the second stage is based on a program that would require vessels to take one 30-day block out of the multispecies fishery during each quarter.

The Council recognizes the need for conservation measures as soon as possible. It also recognizes that the additional time is needed to fully develop and take public comment on the measures for the second stage. The Council will submit the second stage as Framework 31, pending approval at its May 26-27, 1999 meeting.

3.1.1 Closed areas

The Council proposes closing the area described below to achieve part of the rebuilding goals for GB cod. The closures would be in addition to existing year-round closed areas. If Framework 31 measures are not implemented by August 15, the Council proposes a trip limit described in the following section to fully achieve the needed 22 percent reduction in fishing mortality.

Current area closures apply to all gear capable of catching regulated species except to those gears that are currently classified as exempted gears. Exempted gear means gear that is deemed to be not capable of catching NE multispecies and includes: pelagic hook and line, pelagic longline, spears, rakes, diving gear, cast nets, tongs, harpoons, weirs, dipnets, stop nets, pound nets, pelagic gillnets, pots and traps, purse seines, shrimp trawls (with a properly configured grate), surf clam and ocean quahog dredges, and midwater trawls. Recreational fishing is exempt, however, party/charter vessels fishing while under DAS are considered commercial vessels and are prohibited from fishing in the closed areas.

In Framework 27, the Council also exempted scallop dredge vessels from the rolling closures in the Gulf of Maine. It is proposing a similar exemption for the one month closure proposed in this framework action.

The Council proposes to close blocks 109-114, 98 and 99 for a 30-day period upon effectiveness of the implementing rule (anticipated for June). As noted, this proposal is the first stage of the two-stage

strategy incorporating Framework 31. If Framework 31 is not implemented by August 15, then the trip limit described in Section 3.1.2 would take effect. See Figure 1 for a reference map showing block numbers.

Discussion: The Groundfish Committee identified this as one of two options that would use area closures during the interim period before the industry-proposed plan for blocks of time out of the fishery could be implemented through a follow-up action, Framework 31. If the follow-up action is not implemented, then a trip limit of 2,000 pounds per day/20,000 pounds maximum would take effect on August 15, with authority given to the Regional Administrator to adjust the trip limit based on an evaluation of the risk of exceeding the TAC. Analysis results suggest that this closure will achieve between 2 percent and 11 percent of the needed 22 percent reduction, depending on assumptions about effort displacement.

The Council chose this alternative because it closes a relatively large area for a shorter period of time, rather than smaller areas for longer periods. This strategy will maximize opportunity for vessels affected by the closure to fish over a greater part of the year. The timing of the closure is as close as practicable to the peak fishing period that follows the end of the spawning season. The chosen alternative also closes contiguous areas which reduce the enforcement costs.

3.1.2 Trip limit

The Council proposes a Georges Bank cod trip limit to apply to vessels enrolled in the GOM Cod Trip Limit Exemption Program as a backstop measure that would not become effective until August 15 in the event that Framework 31 is not implemented. The trip limit measure is as follows:

- vessels enrolled in the Gulf of Maine Cod Trip Limit Exemption Program will be limited to 2,000 pounds per day and 20,000 pounds maximum of cod, to be effective if Framework 31 is not implemented.
- when the 75 percent of the target TAC is reached (at approximately 4,012 metric tons, or 8.9 million pounds), the Regional Administrator may reduce the trip limit (based on a determination of the risk of exceeding the TAC) to a level calculated to keep landings below the TAC.
- if, by January 1, 2000, the Regional Administrator determines that there is a high probability that landings for the fishing year will be less than 75 percent of the target TAC, then the Regional Administrator would be authorized to increase the trip limit to allow landings to achieve at least 75 percent of the TAC.

Discussion: The Council has used trip limits in combination with area closures, DAS and gear controls to manage species-specific fishing effort with varying degrees of success. The most successful program of this type is the management of the Georges Bank haddock fishery, where these measures have contributed to a three-fold increase in spawning stock biomass (SSB) over the past five years. In the Gulf of Maine cod fishery, however, where these measures have been phased in over only the past three years, the stock has not yet responded similarly. The cause of this continued decline could be attributed to several factors, including the differences in implementation between the two programs (for example, higher initial trip limit, running clock, timing and location of area closures), poor recruitment and survival of pre-recruits, and the ubiquitous nature of cod in inshore fishing grounds which raises the level of bycatch in alternative fisheries.

The strategy behind this approach is to use the trip limit as a dis-incentive to target the species but to allow vessels to land any bycatch. By applying the trip limit on a per-day basis, the Council can accommodate trips of varying length, although this approach significantly increases administration and enforcement costs, and shifts the entire enforcement burden shoreside. Enforcement agents have commented repeatedly that enforcement of the GOM cod trip limit is minimal because of the cost and difficulty. Furthermore, the Council recognizes that trip limits increase discards in situations when catches are unexpectedly or unintentionally larger than the limit. Despite these concerns, the Council proposes a trip limit for GB cod as a backstop measure because, unlike the other management tools (area closures, DAS reductions and gear controls), trip limits are specific to the stock of concern and do not impose additional costs or regulatory burden on vessels engaged in fisheries that do not catch cod.

The trip limit analysis discussed in Section 4.1 indicates that a trip limit of 2,000 pounds per day applied at the start of the fishing year, with no other additional measures, would result in landings of 5,947 mt, compared to a TAC of 5,354 mt. The addition of the 20,000 pound maximum possession limit would have the minimal effect based on the pattern of catches in 1998, when only two trips of ten days or longer (out of 179 trips) also exceeded 20,000 pounds of cod. The maximum possession limit would, however, reduce the incentive for vessels on trips of ten days or longer to target cod and land more than 20,000 pounds, regardless of trip length.

The analysis in Section 4.1 shows that to stay below the TAC, the trip limit would have to be set slightly below 1,500 pounds per day. The analysis also shows that at 2,000 pound per day trip limit in combination with the proposed area closure (Option 6) would reduce landings to approximately 5,800 metric tons under the full effort displacement assumption. The Council believes that this assumption is not realistic, however, because displaced vessels will probably not be able to recoup all of the cod catch in the open areas during the time of the closure or at other times.

3.2 Alternatives considered and rejected

3.2.1 No action

The Council rejected the no-action alternative because it would not achieve the plan objectives for GB cod.

3.2.2 Closed areas

The Council considered four primary area closure alternatives, some in combination with a trip limit, and two area closure alternatives to be implemented in conjunction with Framework 31. It adopted one of the latter two.

3.2.2.1 Closed Area Option 1

This option would close the following block/month combinations:

Block	Month(s)
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 would not require a trip limit.

3.2.2.2 Closed Area Option 2

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

Discussion: 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.

3.2.2.3 Closed Area Option 3

This option would close blocks 109-114 year round.

Discussion: The Council directed the staff to include an option that closes these specific blocks for sufficient time to keep projected landings below the TAC without a trip limit. The two-bin analysis, that displaces effort from the closed areas into the open areas, indicated 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.

3.2.2.4 Closed Area Option 4

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

Block	Month
98	July, August
110	May
111	April, May
113	July
114	June

Discussion: This option 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.

3.2.2.5 Closed Area Option 5

This option would close block 114 in June and blocks 98 and 113 in July as the first stage of the two-stage strategy incorporating Framework 31. If Framework 31 is not implemented by August 15, then the trip limit described in Section 3.1.2 would take effect.

Discussion: The Groundfish Committee identified this as one of two options that would use area closures during the interim period before the industry-proposed plan for blocks of time out of the fishery could be implemented through a follow-up action, Framework 31. If the Council concurs with the committee's recommendation, and if the follow-up action is not implemented, then a trip limit of 2,000

pounds per day/20,000 pounds maximum, would take effect on August 15, with authority given to the Regional Administrator to adjust the trip limit based on an evaluation of the risk of exceeding the TAC.

3.2.3 Trip limit

The Council considered the trip limit that it now proposes as a backstop measure to Framework 31 as the primary conservation measure.

Discussion: The Council rejected this measure for several reasons, primarily because it was concerned about enforceability, discards, fairness and efficacy. Enforcement agents and the Enforcement Committee have repeatedly stated that trip limits, especially per-day limits, cannot be enforced adequately, if at all. Fishermen have stated that trip limits will cause discards, especially when there is no running clock, because individual sets of fixed gear or haul-backs of mobile gear unpredictably exceed the limits at times. They also state that a trip limit will not impose any restriction on small-scale operations and be overly restrictive on larger-scale operations. The Council is also uncertain about the effectiveness of a GB cod trip limit in reducing fishing mortality rates based on its experience with the GOM cod trip limit.

3.2.4 Gear restrictions

The Council proposed gillnet and hook restrictions for vessels fishing on Georges Bank. For the purpose of this framework, vessels enrolled in the Gulf of Maine Trip Limit Exemption Program are deemed to be fishing on Georges Bank. Vessels not enrolled in the program are subject to the 200 pound per day cod trip limit. The Council considered the following measures:

- **Hook gear** Vessels would be limited to 4,000 hooks set per day, a reduction from 4,500 hooks under current regulations
- **Gillnets** Vessels enrolled in the Day Gillnet category would be limited to 50 stand-up nets. Based on the current net tagging program, vessels would be allowed to fish 100 flounder nets.

Discussion: Fishermen from Cape Cod proposed a number of gear restrictions covering hook, gillnet and trawl fisheries, as an alternative to cod trip limits and additional closed areas. Their approach is based on the premise that less gear will reduce the amount of fish caught per DAS, thereby achieving the plan goals. For the trawl sector, the group proposed smaller roller gear size to reduce the ability of trawls to fish on hard bottom, thereby protecting habitat and reducing the amount of area susceptible to trawling. The Council, however, did not consider the trawl gear restrictions that were proposed, in part because they would impose additional costs (to purchase the new gear), but also because the measure did not represent a reduction in effort per DAS. After considering the fixed gear limits, and taking public comment, it chose to re-consider these proposals in Framework 31.

While the industry proposed these measures as an alternative to trip limits, the Council views these as potentially working in conjunction with them. Although, mobile gear vessels that reach the trip limit can simply stop fishing or move to another area where cod catch rates are lower, fixed gear vessels have

less control over the size of their catch, mainly achieved by controlling the amount of gear fished. Reducing the allowed amount of gear will reduce the likelihood that the trip limit will be exceeded when the gear is set out.

In discussing this industry proposal, which included increasing the minimum fish size for cod, the Council also considered increasing the minimum mesh size for gillnets from 6 inches to 6.5 inches, possibly phasing in the increase over one year. The PDT was unable to analyze this proposal in the time available, and the Council staff noted that the Council has frequently sought gillnet selectivity studies, especially for the larger mesh sizes, in recent years, but those studies have not been conducted. Analysis of the impacts of a gillnet mesh size increase would, therefore, rely on projections of sea-sampling observations and commercial catch data

3.2.5 Increase the cod minimum fish size

The Council proposed increasing the size for cod to 21 inches from 19 inches.

Discussion: By increasing the minimum size for cod, the Council intended to increase the spawning stock biomass per recruit and yield per recruit. The recreational minimum fish size has been 21 inches since 1996, under Amendment 7. The Council decided to consider this proposal in Framework 31 rather than in this framework.

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.

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.

3.2.6 DAS reductions

This option would have reduced DAS allocations for all multispecies vessels by an amount that would equate to an effective reduction in 22 percent across the fleet. Table 2 contains five alternative allocations for Fleet and Individual DAS vessels that the MSMC calculated would produce the desired reduction.

OPTION	FLEET (DAS Allocations)	INDIVIDUAL (% Reduction from 1993 baseline DAS)
A	57	64
B	62	67
C	66	70
D	71	73
E	74	74

Table 2 DAS allocations for 1999 by permit category to achieve an effective 22 percent reduction in overall DAS used. Each option in the table would result in the same total DAS used based on 1997 DAS utilization rates.

Discussion: DAS are one of the primary effort control measures in the multispecies fishery management program. The Council set current DAS allocations in Amendment 7 based on the average percentage reduction in fishing mortality needed for the five key stocks and an assumed linear relationship between DAS and fishing mortality. As discussed below, it did not adopt this option for several reasons, primarily because it would have reduced fishing opportunity for all multispecies vessels, including those that do not catch GB cod and those that fish only in the Gulf of Maine, where severe restrictions were recently put in place, under Frameworks 26 and 27. The Council was also concerned about the administrative difficulty of imposing DAS reductions after the start of the fishing year and about the way to distribute the reduction across Fleet and Individual DAS permit categories.

Reducing DAS by the amount needed to achieve the reductions in effort for a single stock in a multispecies complex has several possible effects. Overall effort on all stocks may be reduced proportionally, even if such reductions are not needed. Effort displacement resulting from other stock-specific restrictions (area closures or trip limits) is minimized. And vessels may redirect their DAS to stocks of higher value or profitability, even if that stock is the one that is to be protected. Thus, potentially there are both positive and negative impacts for the fishery.

Based on past experience, the behavioral response of individual fishermen to reduced DAS cannot be predicted. Vessels may fish closer to shore to reduce the proportion of DAS used in steaming to the fishing grounds. Vessels may become more efficient in their use of DAS. And vessels may re-direct

effort onto other fisheries, such as exempted fisheries, and reserve their DAS for optimum groundfishing periods, placing additional pressure on exempted fishery resources.

Another potential issue with this proposal relates to the timing of implementation. If the action is implemented after the start of the fishing year, some vessels will have already used a portion of their DAS while others will still have the full amount. Either DAS used between May 1 and the effectiveness date of this framework will have to be counted against the new allocation, or vessels that did not use DAS during the interim period will take a proportionally larger percentage reduction than those vessels that did use some.

The MSMC report contained an option for reducing DAS based on the required 22 percent reduction in GB cod fishing effort. The Council included this option as part of Option 3 in the Framework 27 document, with additional measures to achieve the needed reductions in fishing mortality on GOM cod. For comparison to Table 2, current allocations are 88 DAS for vessels in the Fleet category, and 50 percent of the 1993 baseline allocation for vessels in the Individual DAS category.

In Framework 27, the Council developed an array of measures to reduce effort on GOM cod with no change in DAS allocations through an extremely arduous process of negotiation and compromise. This option would impose a DAS reduction on top of the measures already programmed to severely reduce fishing effort on GOM cod.

4. Analysis of impacts

The following section contains the analysis of both the proposed action and the alternatives that the Council considered but did not adopt.

4.1 Biological impacts

4.1.1 Impacts on regulated species

The options that the Council considered were designed primarily for their impact on GB cod although they would also impact the fisheries for other primary species, haddock and yellowtail flounder, as well as other stocks in the fishery management unit. The impact on the other stocks is not expected to be directly proportional to the impacts on cod because of the different spatial and temporal distribution of fisheries directed on those other stocks. Furthermore, fishermen's behavioral responses to the area closures and, if implemented, restrictive trip limits will cause a redistribution of effort within the multispecies fishery onto other stocks as vessels seek to maximize revenues per DAS.

Appendix II shows the 10-year projection for Georges Bank cod from 1998, incorporating landings in 1998 and applying the $F_{0.1}$ fishing mortality target for subsequent years. In other words, the table shows expected rebuilding if the Amendment 7 target is met in each of the next nine years. The results, which are highly sensitive to assumptions about recruitment, indicate that there is a 24 percent probability that stock biomass will reach the 108,000 metric ton threshold for maximum sustainable yield in 2007.

Analysis of Framework 30 Proposed Measures

Assumptions

Each of the proposals was analyzed using a common data set derived from the 1997 Vessel Trip Report (VTR) data. The 1997 data represent the most recent complete set of VTR data since the 1998 fishing year has not yet ended.

Two fundamental assumptions were incorporated into the analysis of the proposals. The first assumption is an increase in Georges Bank cod exploitable biomass of 11%, which was incorporated directly into the trip limit analysis. The second assumption is a 7.4% decrease in expected days at sea usage in 1999 compared to 1997 based on several factors, including vessels leaving the fishery (for example, buyback or retirement) and changes in DAS usage for each permitted vessel in 1998 relative to 1997.

4.1.1.1 Impact of a Georges Bank cod trip limit

This section contains analysis of a trip limit that is imposed at the start of the fishing year, however, the Council proposes that the trip limit only take effect on August 15, in the event Framework 31 is not implemented.

Georges Bank Cod Trip Limits

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 1999-2000 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 1999-2000 fishing year required that the 1997 trips be scaled to account for the projected increase in stock biomass that occurred between 1997 and 1999/2000. 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 MMC report project an 11 percent increase in exploitable biomass between 1997 and 1999 (compared to a 37 percent decline for GOM cod). 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) to account for the expected increase in catch rates due to the projected increase in stock size.

The PDT referenced the trip limit analysis that was done for Framework 27. The table of expected 1999 landings of Georges Bank cod at various trip limit intervals represents landings projected forward from 1997 based on an 11% increase in exploitable biomass between 1997 and 1999. This approach assumes that F will have remained constant at the 1997 level (0.26) in 1998 and 1999. In reality, 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).

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. The adjustment is 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 is 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. See Table 3.

The landings associated with the target F (0.18) in 1999 is 5,354 tons (U.S.), assuming 1,900 tons Canadian catch. Thus the difference between the re-computed landings at the various trip limits and the 5,354 tons represent the required additional percentage reductions which must be obtained from other measures such as closed areas.

Trip Limit (Pounds/Day Absent)	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	No Trip Limit
Landings (mt)	3958	5891	6955	7528	7854	8038	8156	8234	8285	8312	8366
FW 27 Landings Revised	3127	4654	5494	5947	6205	6350	6443	6505	6545	6566	6609

Table 3 Framework 27 and revised projected landings (mt) of GB cod estimated under trip limit regulations ranging from 500 pounds/day to 5000 pounds/day during the 1999/2000 fishing year. The target TAC for GB cod in 1999 is 5,354 mt.

The PDT discussed the potential impact of the 20,000 pound cap on the total landings. 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 4).

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

Source: VTR database

Table 4 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 will also be 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.

4.1.1.2 Area closure analysis

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 month-blocks are then accumulated to form a single open area (bin 2). The landings rate 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. It completed the analysis of Options 1-4 before the March 22 Groundfish Committee meeting. Option 1 was based on incrementally picking the block-month combinations with the highest landings. Options 1 and 2 would meet the TAC targets without a trip limit. Option 3, based on the Council request to analyze 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 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.

Following the March 22 committee meeting, the PDT re-ran the analysis, including the two options added by the committee. Table 5 describes the blocks and months closed for each option analyzed. The Council proposes the areas in Option 6 be closed for a 30-day period following effective date of the rule. Since the PDT could not anticipate exactly when that closure would take effect, it analyzed both June and July closures. Mid-month closure results would fall between the calendar month results. The analysis results shown in Table 6 are based on the two-bin model. This analysis indicates that Option 6, the proposed action, will result in landings between 6,431 and 6,517 metric tons, depending on the date the closure takes effect.

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 7 shows the percent change in catch attributed to each closure option if all the catch from the block/months that are closed were saved compared to the percent change resulting from the 2-bin model. This table indicates that Option 6 will achieve one-half of the needed 22 percent reduction in GB cod catch. The Council expects that the remaining reductions will result from either the backstop trip limit measure or the Framework 31 measures, whichever is implemented.

Option	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 (2000 lb. Trip Limit)	98	7,8
	110	5
	111	4,5
	113	7
	114	6
Option 5 (Committee)	114	6
	98, 113	7
Option 6 (Committee) June	98, 99, 109-	6
	114	
Option 6a (Committee) July	98, 99, 109- 114	7

Table 5 Description of area closure options input to the analysis

Trip Limit (Lbs/DAY)		Option 1 (PDT)	Option 2 (PDT)	Option 3 (PDT)	Option 4 (PDT)	Closed Area Option 5 Committee	Closed Area Option 6 Committee (June Close)	Closed Area Option 6a Committee (July Close)
No Limit	6,609	5,439	5,347	5,889		6,318	6,431	6,517
5000	6,566	5,404	5,312	5,851		6,278	6,389	6,475
4500	6,545	5,387	5,295	5,832		6,257	6,368	6,454
4000	6,505	5,353	5,262	5,796		6,219	6,329	6,414
3500	6,443	5,303	5,213	5,741		6,160	6,269	6,353
3000	6,350	5,226	5,137	5,658		6,071	6,179	6,261
2500	6,205	5,106	5,020	5,528		5,932	6,037	6,118
2000	5,947	4,894	4,811	5,299	5,269	5,685	5,787	5,864
1500	5,494	4,522	4,445	4,896		5,253	5,346	5,418
1000	4,654	3,830	3,765	4,147		4,449	4,528	4,589
500	3,127	2,573	2,530	2,786		2,989	3,042	3,083

Table 6 Results from the two-bin model for area closure options, showing the effect of various trip limits on Georges Bank cod.

	OPTION						
	1	2	3	4	5	6	6a
						(June)	(July)
% Reduction 2-Bin	17.7	19.1	10.9	11.4	4.4	2.7	1.4
% Catch Attributed to Blocks	34	40	49	23	10	12.1	10

Table 7 Comparison of percent change in catch resulting from area closures under the 2-bin model to the percent of catch attributed each block/month combination.

4.1.1.3 DAS reductions

The following analysis of DAS reductions is carried forward from the draft Framework 30 document and pertains to a measure considered and rejected by the Council. The proposed reduction in DAS allocations was calculated to achieve an effective reduction of 22 percent in fishing mortality based on the assumed one-to-one relationship between nominal effort and fishing mortality and the Amendment 7 target. If fishing patterns remain the same in the upcoming fishing year as they were in 1997, the year on which the analysis is based, then the outcome, in terms of cod mortality, would be as anticipated. If, on the other hand, vessels change how they use their DAS, directing either more or less effort on cod, then the actual impact of the DAS reduction would be different than projected. The number and variability of factors affecting individual operator's decisions, such as relative availability of other species, market conditions, or personal/vessel capability, prevent meaningful analysis of the range of potential impacts. However, over the short term, the reduction is likely to produce the expected result because broad changes in fishing patterns across the entire fleet do not usually occur rapidly and the Council will monitor such changes through the annual adjustment process.

Figure 2, from the 1998 MSMC Report to the Council, shows the utilization of DAS by vessels in the Fleet and Individual DAS permit categories, with DAS for the 1998 fishing year projected from data through September 30, 1998. The figure shows that while Fleet DAS vessels on average used less than 1/2 the allocated DAS, vessels in the Individual DAS category averaged 82-89 percent, with most vessels using over 90 percent of their allocated DAS. The MSMC projected that the average for the entire fishery in 1998 would be 54 percent.

Table 8 shows the monthly DAS usage for fishing year 1996-1998. Data available to the MSMC through September 30, 1998 showed 23,025 DAS used, however, updated data showed 24,941 DAS used. Through March, 1999, multispecies vessels used 47,483 DAS. If vessels used the same number of DAS for April in the 1998-99 fishing year as they did in the previous year, the total DAS used would reach 52,960, an increase of seven percent from the 49,470 used in the 1997-98 fishing year, and an increase of 879 DAS over the 1997 usage. The MSMC had projected that DAS would decline 7.4 percent between the 1998 and 1999 fishing years based on preliminary 1999 data, utilization rates and the effects of the vessel buyout program. The percent of total DAS used would increase to 36 from 32 percent in the prior year.

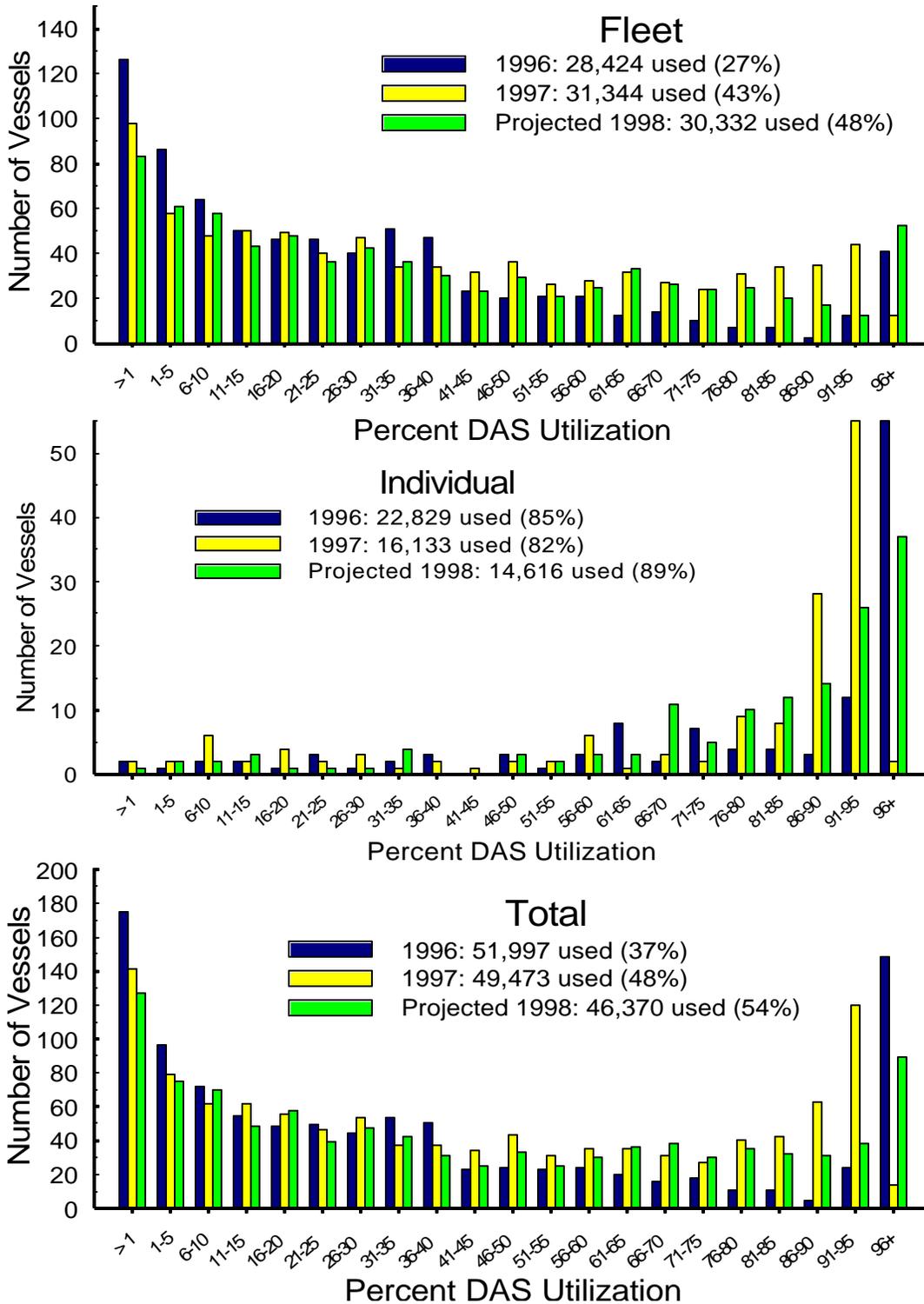


Figure 2 Percent of allocated DAS used by multispecies vessels in each permit category, 1996-1998, derived from NMFS VMS/call-in data. DAS for 1998 were expanded to an annual total based on DAS reports from May 1 to September 30, compared to the seasonal DAS data for each vessel during 1997. From the 1998 MSMC Report to the Council.

	1996 Fishing Year		1997 Fishing Year		1998 Fishing Year			
	DAS Used	% Total DAS Used	DAS Used	% Total DAS Used	DAS Used			
					Sept. 98	Updated Apr. 99		
					G	NG	Tot.	
May	4,289	8%	5,419	11%	5,897	1,139	4,946	6,085
June	3,661	7%	5,403	11%	5,185	1,243	4,117	5,360
July	5,508	11%	4,307	9%	4,763	1,081	3,843	4,924
August	5,020	10%	4,055	8%	3,846	780	3,218	3,998
Sept.	4,861	9%	3,852	8%	3,334	938	3,535	4,473
Oct.	4,627	9%	3,753	8%	-	779	2,864	3,643
Nov.	4,749	9%	3,253	7%	-	678	3,146	3,824
Dec.	4,505	9%	3,543	7%	-	649	3,715	4,364
Jan.	3,370	6%	3,112	6%	-	549	3,425	3,974
Feb.	3,507	7%	3,181	6%	-	309	2,676	2,985
March	3,268	6%	4,115	8%	-	350	3,503	3,853
April	4,716	9%	5,477	11%	-			
TOTAL DAS USED	52,081	100%	49,470	100%	23,025			47,483
Total DAS Allocated	238,075	22%	155,270	32%	146,903			

Table 8 Monthly DAS usage for fishing years 1996-1998. Figures for 1998 include data as recorded through Sept. 30, 1998 and reported in the MSMC Report, and updated data reported by NMFS Enforcement in April, 1999. The Enforcement Report separated Gillnet (G) and Non-Gillnet (NG) DAS.

4.1.1.4 Gear restrictions

The PDT could not quantify the impact of proposed reductions in numbers of hooks and gillnets with the data available. Qualitatively, since the proposals involve reductions, not increases in gear, however, they are likely to have a positive conservation benefit. Hook vessels are currently allowed to set 4,500 hooks per day, compared to the proposed 4,000 hooks. Day gillnet vessels are allowed to set 80 stand-up nets, compared to the proposed 50 nets.

4.1.1.5 Minimum fish size increase

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.

4.1.2 Impacts on other species

The alternatives that the Council considered most likely to have a direct impact on other species are the DAS reductions and the area closures. As noted in the discussion of the proposed DAS reduction, if the distribution of effort (the targeting of different species) under DAS remains as it was in 1997, the reductions in fishing mortality on other regulated species will be proportional to the effective reduction in DAS. On the other hand, if vessels redirect their effort to other species within the multispecies group, the impact will either be greater than or less than the percentage reduction in DAS, depending on how that redirection occurs. The way fishermen would respond to such a reduction in DAS, in terms of target species, cannot be predicted and depends on a number of factors such as market conditions or availability. Since overall multispecies effort would be reduced, however, the impact on other regulated species is likely to be positive.

The impact of area closures on other species depends in large part on the relative abundance of those species in the closed and open areas, the ability of displaced vessels to target them, and the duration of the closure. For example, Table 9 shows the results from the two-bin model for haddock, yellowtail flounder, white hake and winter flounder. The results range from a decrease in winter flounder landings of 21.2 percent to an increase in white hake landings of 46 percent, reflecting the different distributions of the species analyzed relative to the closed areas which were designed based on GB cod landings. The table indicates an increase in landings under Option 6, although relative small – less than eight percent for each stock.

Species	Percent change in landings						
	OPTION						
	1	2	3	4	5	6 June	6 July
Haddock	4.8	-4	12	8	3.4	6.1	5
Yellowtail	10.0	13	22	7.5	3.3	5	5
White Hake	12.5	14	46	11	5.7	7.2	7.8
Winter Flounder	-11.6	-21.2	7.6	-3.6	1.1	3.3	-1

Table 9 Percent change in landings of four regulated species calculated using the two-bin model applied to trawl, gillnet, hook and dredge effort for blocks 60-123.

4.1.3 Impacts 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.* (1997). 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 action proposed in Framework 30 is intended to reduce fishing mortality on Georges Bank cod by 22 percent from 1997/1998 levels over the course of the 1999 fishing year. Measures would be implemented in two stages: a) a 30-day area closure to take effect as soon as possible after approval by the Secretary of Commerce and appropriate notice to the fishing industry; and b) a cod trip limit to take effect by August 15, 1999. The trip limit is considered a fall-back measure to take effect only if the Council does not approve Framework Adjustment 31 to the FMP, an action that would require 30-day blocks out of the multispecies fishery during each quarter of the year. Final approval of Framework 31 is expected at the May 26-27, 1999 Council meeting.

The closure proposed will affect all gear capable of catching finfish regulated by the Multispecies Plan. 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 under the Marine Mammal Protection Act *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 proposed to be exempt from the 30-day closure. The available information indicates their continued presence in the closure area should not represent an increased threat to endangered or other protected species.

The Framework 30 closure area represents a significant portion of the Great South Channel/Georges Bank region that is considered a high-use area by a number of endangered as well as other marine mammal species, particularly in the spring and summer months. Fin, humpback and minke whales and white-sided dolphins regularly feed in the region throughout this period. Although the timing is variable, a significant portion of the right whale population also aggregates here in response to dense concentrations of *Calanus finmarchicus* from April through June, with a peak in May. In recognition of this behavior, and given the highly endangered status of the North Atlantic right whale population, the Great South Channel area was designated as critical habitat and in 1997 was closed to sink gillnet gear from April 1 to June 30 through Framework 23 to Northeast Multispecies FMP.

Adoption of Framework 23 removed the jeopardy finding for the northern right whale contained in the 1996 Endangered Species Act Section 7 consultation on the Multispecies FMP. The Atlantic Large Whale Take Reduction Plan (ALWTRP) first implemented in 1997, incorporated the Great South

Channel gillnet gear prohibition and is considered an expanded reasonable and prudent alternative. While Framework 30 does not compromise any of the ALWTRP measures (prohibition on certain fishing practices, expanded disentanglement efforts, gear marking and gear research) it may increase protection for right whales. The April through June Great South Channel critical habitat closure left open an area known as “the sliver”, a narrow band west of Loran C 13710 where gillnetting is allowed because of the historic low abundance of right whales in the area and the relatively low level of gillnet effort. Closure of Blocks 98 and 113 would preclude gillnetting in the sliver for a 30-day period and, depending on the timing and the presence of whales, could further reduce any entanglement risks. Right whale critical habitat itself will not be affected nor adversely modified by the action proposed.

Framework 30 will be implemented in the early summer and will principally affect the Georges Bank/Great South Channel area, negative impacts to harbor porpoise are unlikely to occur. Although possibly more abundant in this region at one time, porpoise are now more heavily distributed in the western Gulf of Maine and begin to move northward to the Bay of Fundy in the summer. While the potential for entanglement clearly exists, a 30-day closure would enhance the protection already provided for in the Harbor Porpoise Take Reduction Plan. The use of areas closures specifically to protect porpoise and the use of pingers are already required by the Take Reduction Plan in areas open to groundfish fishing.

Although it is difficult to predict, the area closure 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 this period and engage in alternatives such as fishing for bluefin tuna. 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 area 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.

The cod trip limit proposed in Framework 30, 2,000 pounds per day and a 20,000 pounds maximum possession limit, is intended to discourage fishermen from targeting Georges Bank cod, while allowing them to land any bycatch. The measure should have few direct impacts on protected resources. If the trip limit is reduced because 75 percent of the TAC has been reached, however, effort could be redirected into other fisheries that have the potential to adversely affect protected species. If Framework 31 is implemented prior to August 15 and replaces the trip limit measure, the impacts of 30-day blocks out of groundfish fishing per quarter and any other associated measures will be discussed relative to protected species.

Several alternatives to the proposed action are discussed in Framework 30: 1) a closure of the block/month combination with the highest cod landings and no trip limit; 2) closure of contiguous block/month combinations with no trip limit; 3) a closure of a contiguous strip of blocks that would allow the catch of cod to remain below the TAC, but that would also require a 2,000 pound limit to do

so; 4) closure of blocks using a 2,000 pound trip limit as a starting point; and 5) an option similar to the proposed action that requires the closure of blocks in addition to a 2,000 trip limit.

Impacts of the trip limit have been discussed above. Closing non-contiguous blocks at different times could produce results which were demonstrated during the Council's efforts to reduce the bycatch of porpoise in the Gulf of Maine. Unless area closures are of sufficient size and duration, little conservation benefits are realized because of effort displacement and the mobility of marine mammals. The closure of individual blocks, therefore, may have very little value for any protected species inhabiting the area closed.

The gear restrictions considered but not adopted in Framework 30, a reduction in the allowable number of hooks and gillnets, could have positive, although unquantifiable benefits for protected resources because they represent an overall reduction of gear in the water. Similarly, a reduction in days-at-sea could have benefits for endangered and threatened species because of the associated effort reductions. Gains could be outweighed if fishing strategies were altered so that available days were used to target fish in areas and at times where marine mammals encounters were more likely to occur than under the previous scenario. An increase in minimum fish size, also discussed and rejected, is a fish conservation measure that should have little or no impact on protected resources.

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.

The management measures proposed in Framework 30 may affect, but are not likely to jeopardize the continued existence of endangered and threatened species.

The Council recognizes that this conclusion does not change the basis for the previous determination that overall operation of fisheries under the Northeast Multispecies FMP, without modification, is likely to jeopardize the continued existence of endangered species under NMFS jurisdiction. Should activities associated with the Multispecies FMP change significantly or new information become available that alters this determination, the Council will reinitiate consultation.

4.1.4 Impacts on habitat

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. The alternatives and actions proposed in this framework adjustment will not increase any adverse impacts on essential fish habitat (EFH) resulting from fishing activity.

All alternatives presented for consideration proposed to reduce fishing mortality on Atlantic cod, primarily in the Georges Bank region. 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 Georges Bank that have been designated as EFH by the Council. Some of the proposed measures could be expected to provide some benefit to the habitat of the region by directly reducing fishing effort: 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 of fish targeted by the industry, such as permit declarations, mesh size restrictions, or minimum fish size restrictions, are not expected to have a direct effect on the habitat of the region.

The Council considered six proposed options which 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 proposed closure makes it unlikely, however, that this would be enough to allow degraded habitat to recover. The options that included 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.

The Council is proposing a Georges Bank cod trip limit to apply on vessels enrolled in the Gulf of Maine Cod Trip Limit Exemption Program to take effect on August 15 if Framework 31 is not implemented. The Council also considered a stand-alone trip limit or one that would work in conjunction with one of the proposed closed area options. In any case, implementation of trip limits would not be expected to have a direct effect on the habitat of the region. The trip limit could have an indirect effect on the habitat of Georges Bank by reducing the effort associated with each DAS, assuming that fishing effort ceases as soon as the trip limit is reached and does not continue with the intent of "highgrading."

The Council proposed, but did not adopt in this framework, gillnet and hook restrictions for vessels fishing on Georges Bank. The assessment of the impacts to habitat resulting from fishing practices presented in 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 and hooks is thought to have relatively minimal adverse impacts on fish habitat. Therefore, restrictions on gillnet and hook gear are unlikely to have any effect on habitat.

Another option considered but not adopted would have reduced DAS for all vessels by 22 percent, providing a direct overall reduction of fishing effort. This reduction would lessen the fishing pressure on the habitat of the region, although it is unlikely that this would be enough to allow degraded habitat to recover, as fishing effort would still be spread out over all fishing areas.

The Council also proposed to increase the minimum size for cod from 19 inches to 21 inches. This measure would not directly reduce fishing effort, but rather would manage the size class of fish targeted by the industry. Consequently, even if adopted this proposal would not have a direct effect on the habitat of the region.

4.1.5 Impact of taking no action

Despite the evident rebuilding of GB cod, fishing mortality rates under the status quo are above plan objectives and recruitment is low. The MSMC and SAW project that spawning stock biomass growth will slow, and will likely reverse in 2000. Taking no action would delay rebuilding and raise the likelihood that more restrictive measures would need to be imposed in the future. Appendix II shows the rebuilding and landings through 2007, if the fishing mortality target is achieved in 1999 and subsequent years. Taking no action would delay rebuilding and lower the probability of reaching the maximum sustainable yield biomass level within ten years, below the currently projected 24 percent.

4.2 Economic impacts

This section summarizes the economic impacts of proposed closed area and/or trip limit alternatives, including those considered but not adopted, relative to taking no action as measured by the expected change in revenues. The analysis uses the two-bin model described in Section 4.1, substituting revenues from all species for cod landings. As with the biological analysis, this model assumes that vessels displaced by area closures will fish in open areas at the average revenue rate for vessels in the open areas. The economic version of the model, however, distinguishes gear types, and calculates the expected change in revenues by applying the rate of revenue per day at sea in open areas only for vessels using the same gear, not all vessels. This section also contains an estimation of the revenue impacts of the DAS reduction based on the total revenue per DAS and showing the revenue lost per ton of cod saved. The PDT was unable, however, to analyze the economic impact of the minimum fish size increase and the proposed gear reductions.

4.2.1 Impact of the area closure/trip limit reductions

The potential impact of area closure options is estimated using the information on landings, revenues and effort in 1997 (the last full fishing year) using the two-bin model. In this model, vessels are assumed to shift all of their effort into open areas and generate landings and revenues per DAS at the average rate of vessels that used the same gear in the open areas.

Table 10 and Table 11 show the project loss in revenues from the six area closure options, with and without scallop dredge vessels, respectively. Options 1 and 2 do not require a trip limit to achieve the target TAC. This analysis of Option 3 assumes no trip limit, however, to keep landings below the TAC, a 2,000 pound per day trip limit is needed, as shown in the analysis in Section 3.1. Option 4 starts with a trip limit of 2,000 pounds per day as the basis for selecting the needed area closures. The Groundfish Committee recommended Options 5 and 6 to achieve part of the needed reduction, to be followed in August by either Framework 31, implementing blocks of time out of the fishery, or a fall-back trip limit of 2,000 pounds per day. The Council approved the committee's recommendation and proposes Option 6 for this framework.

The tables also show the revenue loss per metric ton of cod saved. For comparison purposes, the trip limit would reduce revenues by the average price per ton of cod, which in 1997 was \$1,896.

The following analysis only examines the revenue impact of the area closure portion of the proposed options. It does not include the effect of the trip limit in those options where a trip limit is needed to stay below the TAC (Options 3, 5 and 6), except that the total revenue loss/mt cod saved for Option 4 includes the cod saved by the combined area closure trip limit. If a trip limit of 2,000 pounds per day is applied in Options 3, 5 and 6, as would be necessary to keep total catches below the target TAC, the revenue loss/mt cod saved would decline as the total amount of cod saved would increase due to the effect of the trip limit.

The short-term revenue impact (loss) of the trip limit is estimated by multiplying the price per ton of cod by the tons of cod saved (that is, not landed) under the trip limit. At an average price of \$1,896 per ton of cod, the 2,000 pound per day trip limit would reduce revenues by \$1.3 million. One reason for the difference between the revenue impact of the trip limit and the area closures is that the trip limit places a loss (in terms of reduced cod landings) on vessels with no gains, in contrast to the results from the two-bin area closure analysis which adds the revenues gained in open areas to the losses from the closed areas.

In the following tables, several cells contain a value of zero because the two-bin model actually produced revenue gains for those gear/option combinations. For example, in Option 3, when the trawl effort displaced from the area closure is multiplied by the catch rate (all species) of trawl vessels in the open area during that time, the revenues actually increased. This could be caused by several factors, including the relative mix of species and the relative catch per unit effort. If a large proportion of the displaced vessel are small in comparison to the vessels fishing in the open areas, then the model would unrealistically apply the open-area catch rate to the smaller vessels, resulting in a net increase. However,

those smaller vessels may not be able to achieve that higher catch rate. Rather than calculate a revenue gain, in those circumstances, the model sets the revenue loss at zero.

The results shown in the following tables may overstate or understate the actual revenue losses, depending on the relative vessel revenue rates between the areas. For example, the revenue losses would be understated if displaced vessel could not achieve the revenue rates of vessels in the open areas. Constraints on achieving this level of revenue include the relative size of vessels (affecting a vessel's ability to travel to all open areas or to generate the same revenues as larger vessels), and the effect of increasing the concentration of effort in open areas on the ability of all vessels to maintain a constant revenue stream.

The results in Table 10 and Table 11 suggest that the option chosen by the Council has the highest cost in terms of revenues lost per metric ton of cod saved. 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.

The model also does not incorporate price changes between 1997 and 1999, or changes due to changes in the stream of landings of different species. Increased prices that result from reduced supply may offset the revenue loss from reduced landings, depending on the price elasticity of the demand for fish, and the availability of imports and other substitutes.

The economic impacts represent only short-term losses from the proposed alternatives. As stated in the FSEIS for Amendment 7, the rebuilding measures will have negative impacts on revenues, producer surplus, and consumer surplus 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 regulated species. Once rebuilt, allowable rates of harvest will increase to levels that maximize yield over the long term.

Option	Cod Saved (No trip Limit)	REVENUE LOSS (all species)					Total Revenue Loss/MT Cod Saved
		Dredge	Gillnet	Hook	Trawl	Total	
Option 1	1,170	1,046,310	900,082	240,669	1,008,786	3,195,847	2,732
Option 2	1,262	3,511,851	1,344,992	1,088,804	1,286,714	7,232,361	5,729
Option 3	720	543,980	1,403,211	610,293	0	2,557,484	3,550
Option 4 (2000 Pound trip Limit)	1,340	0	536,845	105,589	528,893	1,171,327	874
Option 5	291	0	517,994	18,781	38,370	575,145	1,978
Option 6 (June)	178	229,624	489,928	0	0	719,552	4,032
Option 6 (July)	93	0	419,807	589,282	32,926	1,042,015	11,262

Table 10 Revenue impact of area closure options calculated using the two-bin model

Option	Cod Saved (No trip Limit)	REVENUE LOSS (all species) Excluding dredge gear				Total Revenue Loss/MT Cod Saved
		Gillnet	Hook	Trawl	Total	
Option 1	1,170	900,082	240,669	1,008,786	2,149,537	1,837
Option 2	1,262	1,344,992	1,088,804	1,286,714	3,720,510	2,947
Option 3	720	1,403,211	610,293	0	2,013,504	2,795
Option 4 (2000 Pound trip Limit)	1,340	536,845	105,589	528,893	1,171,327	874
Option 5	291	517,994	18,781	38,370	575,145	1,978
Option 6 (June)	178	489,928	0	0	489,928	2,746
Option 6 (July)	93	419,807	589,282	32,926	1,042,015	11,262

Table 11 Revenue impact of area closure options calculated using the two-bin model, excluding scallop dredges

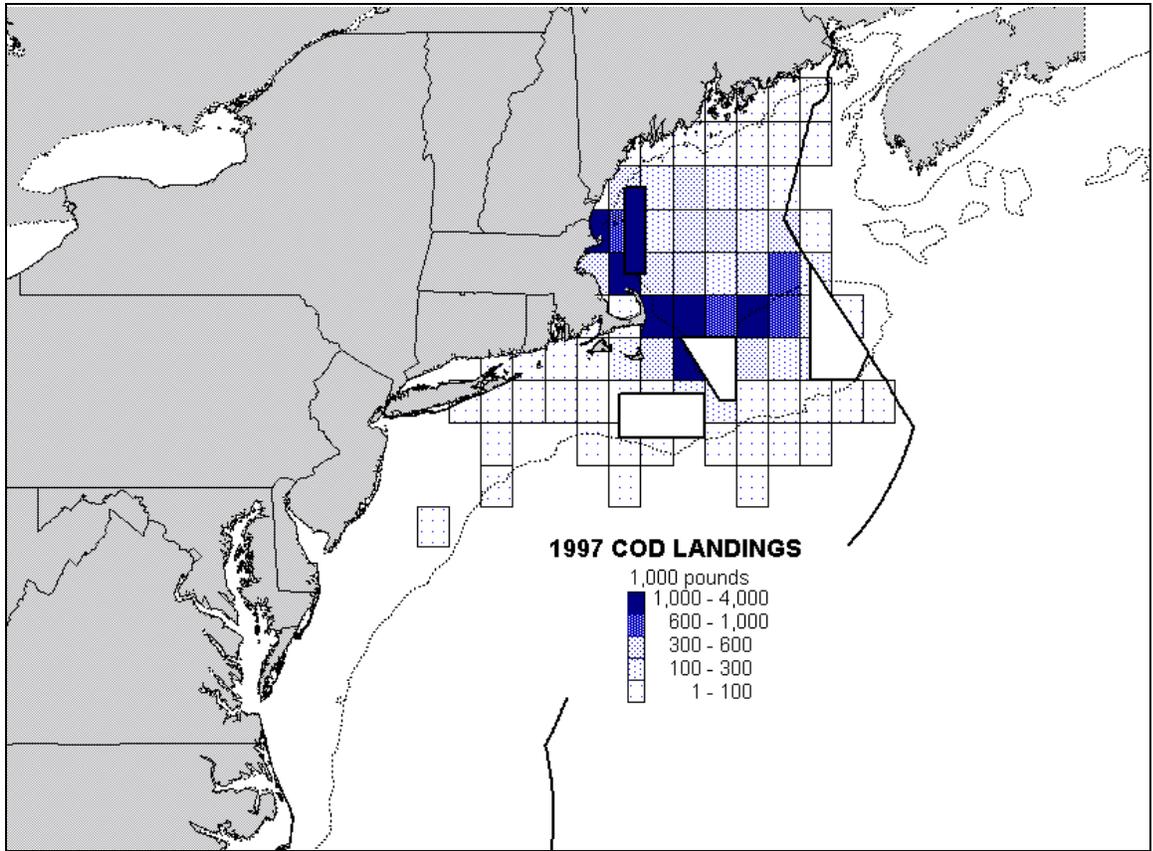


Figure 3 Area distribution of cod landings in 1997.

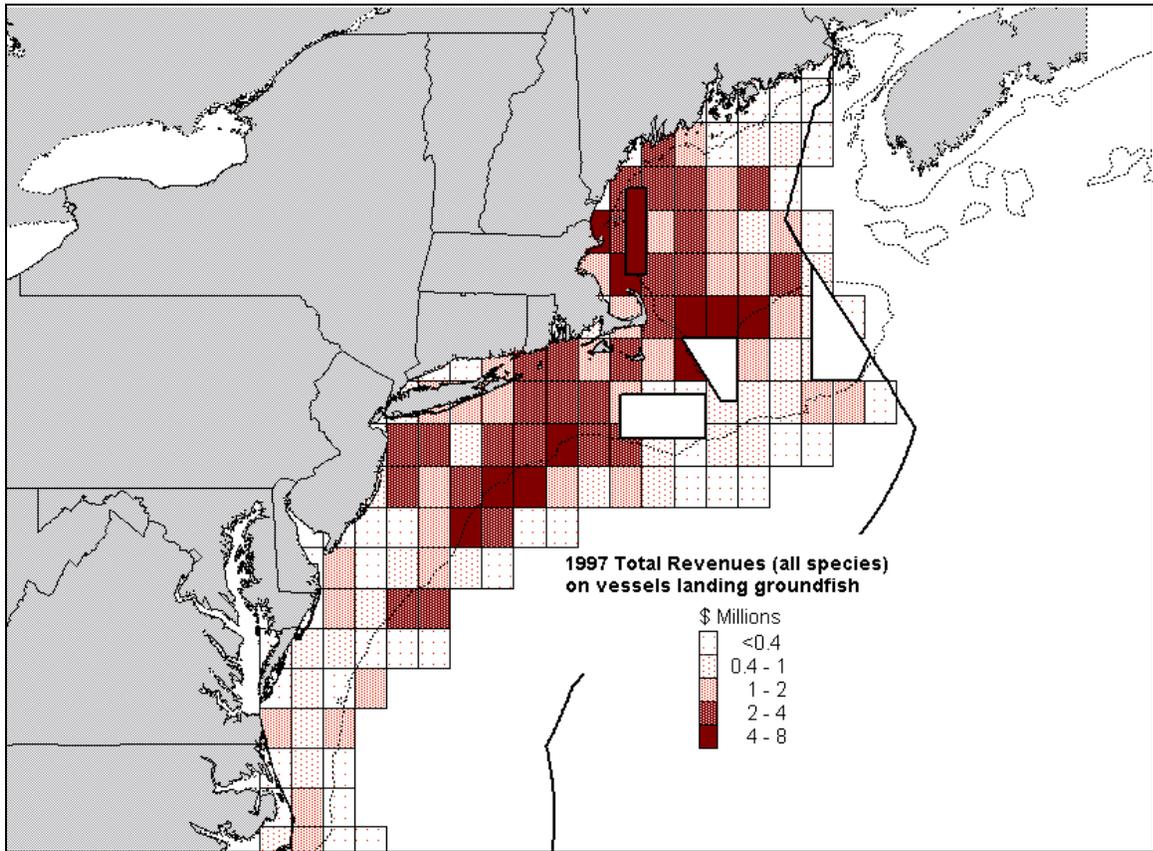


Figure 4 Area distribution of total revenues from all species (all trips) on vessels landing groundfish at least once in 1997.

4.2.2 Revenue impact of DAS reductions

This section discusses the total revenue loss by gear sector for the reduction in DAS proposed but not adopted by the Council. The results shown in Table 12 are calculated by multiplying the total DAS used in 1997 reduced 22 percent by the average revenue per DAS for each gear sector. These results should be interpreted as relative, not as absolute numbers due to changes in the mix of species caught on each DAS and to changes in prices between 1997 and 1999.

The calculation of revenue loss per metric ton of cod saved is based on the expected landings with no trip limit or area closures, reduced by 22 percent, then divided into the total revenue loss. The greater losses, in comparison to the area closure analysis, reflect the fact that the analysis does not consider revenue that might be generated in non-DAS fisheries, so there are no offsetting gains as there are in the two-bin effort displacement model used to analyze area closure impacts.

Gear	Revenue Loss (\$)
Gillnet	1,822,575
Hook	2,306,127
Trawl	21,498,177
Total	25,626,879
<hr/>	
Cod Saved (Metric Tons)	1454
<hr/>	
Revenue Loss (\$ per mt of Cod Saved	17,625

Table 12 Revenue loss estimated for a 22 percent reduction in effective DAS based on average revenues per DAS for each gear sector.

4.3 Social impacts and impacts on communities

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. The following analysis builds on the social/community impact sections of other recent framework adjustments, particularly Framework 27, 26 and 25, which address multispecies stock rebuilding.

When the Council implemented the stock rebuilding plan 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. It also noted that the social impacts are largely related to the economic impacts, and as such would be negative in the short term and positive in the long term, although some fundamental changes would probably occur for which a value cannot be assessed. Some of the expected impacts have already manifested themselves in changes at the vessel and community level. 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 of the live-cod market. Communities have also evolved to support redirection of effort to other fisheries (including establishment or expansion of shoreside infrastructure to support those fisheries, such as herring).

A fundamental problem exists, however, in attributing social change to specific factors such as management regulations when the 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. In recognition of this problem, the Council has convened a Social Sciences Advisory Committee to improve the methods and results of the social impact analysis of proposed management actions.

Nevertheless, the following discussion provides some insight into the potential impacts at the vessel-class and community level based on available data. Since the GB cod stock is driving the measures proposed for this framework, the analysis focuses on vessel classes and communities dependent on the GB cod fisheries.

Table 13 shows the distribution of vessels landing GB cod during the 1997-98 fishing year by port of landing and vessel class (ton class and gear sector). Table 14 shows the distribution of GB cod landings during the 1997-98 fishing year by port of landing and vessel class (ton class and gear sector). The direct social impacts of proposed actions to reduce Georges Bank cod landings will be proportional to the dependence of each community or vessel class on those landings.

Table 13 and Table 14 show that vessels in Massachusetts and Rhode Island comprised the majority (77%) of vessels that landed Georges Bank cod during the 1997-98 fishing year. Similarly, 93.8% of all Georges Bank cod was landed in ports in Massachusetts and Rhode Island during the 1997-98 fishing year. As illustrated by the landings information in Table 14, vessels in Massachusetts are clearly more dependent on GB cod than are vessels in Rhode Island. Landings from vessels in Massachusetts comprised 91.2% of the total Georges Bank cod landings, while landings from vessels in Rhode Island comprised 2.6% of the total.

According to the tables, New Bedford and “other” ports in Massachusetts were most dependent on GB cod during the 1997-98 fishing year. New Bedford vessels landed 36.8% of GB cod that was landed in Massachusetts, and “other” ports landed 41.3 percent. “Other” ports include Scituate, Chatham,

Provincetown, Harwich, Eastham, Hyannis, and smaller ports located along Cape Cod and on the Islands. The table indicates that the vessels that landed GB cod in New Bedford were larger vessels, almost all greater than 51 GRT. In contrast, the majority of vessels that landed GB cod in “other” ports were smaller vessels, less than 51 GRT. Because of their larger average size, the New Bedford vessels are more able to travel farther from shore and would therefore be better able to adapt to regulations involving area closures, such as those proposed in this framework adjustment. On the other hand, larger vessels and, consequently, large-vessel ports would be more negatively affected by trip limits, due to the volume requirements. Cape Cod vessels, in contrast, being generally smaller, cannot travel as far and are likely to be more significantly impacted by area closures of nearshore grounds, and less likely to be impacted by trip limits. However, depending on the actual level, trip limits would prevent the occasional large trips which small boat fishermen rely on to offset the periods of poor fishing or bad weather.

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
SUM	29	3	32	1	19	26	135	49	229	46	24	70	58	390	47
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
SUM	3	2	5	2	0	12	6	36	54	1	10	11	8	80	10
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
SUM	3	1	4	0	0	1	1	37	39	1	0	1	4	48	6
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
SUM	0	1	1	0	1	2	31	155	189	30	15	45	72	307	37
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
SUM	35	7	42	3	20	41	173	277	511	78	49	127	142	825	100

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 13 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	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
SUM	772	3	775	<1	1,868	1,138	5,607	216	8,829	147	216	363	110	10,077	60
Gillnet Sector:															
<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
SUM	78	3	81	3	0	98	4	2,852	2,954	20	30	50	4	3,092	18
Hook Sector:															
<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
SUM	9	<1	9	0	0	247	<1	1,952	2,199	<1	0	<1	14	2,222	13
Other Gears:															
<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
SUM	0	<1	<1	0	1	1	15	1,309	1,326	18	2	20	38	1,384	8
Total of All Gear Sectors:															
<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
SUM	859	6	865	3	1,869	1,484	5,626	6,329	15,308	185	248	433	166	16,775	100

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 14 George's Bank Cod Landings in thousands of pounds* by Gear Sector and Vessel Class May 97 - April 98 Fishing Year

The following paragraphs provide general discussion of the impacts usually associated with the different types of management measures considered by the Council, including the proposed action.

Vessels that would be the most directly affected by the area closures considered in Framework 30, including the proposed action, are those located in communities where the closures would border the coastline and, in some cases, would extend up to 80 or 100 miles offshore. These vessels are primarily located in Chatham, Harwich, Provincetown, and other communities along Cape Cod, Massachusetts. Within this category of affected vessels, smaller vessels (less than 51 GRT) would be at a greater disadvantage to adjust to the new regulations because of their inability to travel beyond the area closures to fish for multispecies while the areas are closed. Medium and larger-sized vessels would 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 of closure.

A majority of the vessels in question, especially those from Cape Cod, are smaller vessels (less than 51 GRT) and may be forced to seek alternatives to fishing for multispecies during this time. Commercial fishing alternatives could be very limited for these small vessels if they are unable to travel beyond the area closures. The communities in which these vessels conduct their fishing activities are likely to experience the greatest short-term social impacts resulting from Framework 30 actions as they adapt to reduced landings and fishing opportunity.

Other vessels that would be affected by Framework 30 area closures are those that have accessed the closed areas to fish for GB cod (and other species) from communities like New Bedford, Massachusetts, Point Judith, Rhode Island, and ports in Maine. These vessels, while inconvenienced and limited in terms of their flexibility, may still have the opportunity to fish in other offshore areas on Georges Bank as well as in other regions. These vessels are more likely to shift their effort into other areas (and perhaps onto other species) and, thereby, reduce the impacts of the closure. However, since length of time spent at sea is an important socio-cultural variable that can affect fishermen's perceptions of job satisfaction, if adapting to area closures requires additional time at sea, there could be some negative social consequences for the fishermen, the crew, and their families.

In general, trip limits can affect the structure of a fishery because they put less capitalized vessels at an economic advantage over more highly capitalized vessels, or vessels with greater fixed costs. This advantage alters the profitability of different vessel classes and can ultimately change the short and long-term structure of the fishery itself. As a result, vessel size groups are potentially in conflict with each other, as the regulations are perceived as unfairly allocating shares of the resource.

A 22% reduction in DAS, which was considered but not adopted by the Council, would affect all multispecies vessels and their communities, not just those fishing for Georges Bank cod. Many multispecies vessels and their communities (primarily shoreside infrastructure) are already adapting to regulations implemented to conserve other groundfish species and to declining abundance of some fish

stocks. Reducing DAS also reduces the number of alternative fisheries for vessels and the economic activity they generate shoreside.

Increasing the minimum size of cod to 21-inches, which was deferred by the Council in this framework, could impact smaller hook boats on Cape Cod that have developed an alternative market for live cod. These vessels target smaller cod, 19-21 inches, for a specialized market in order to receive a better price for their fish. If they can no longer land the fish to supply this market, they will experience more significant losses than other vessels due to the price differential between live cod and regular market cod. In spite of this, many hook fishermen support the fish size increase as an alternative to other types of restrictions such as trip limits or area closures, but not in addition to them. Furthermore, most boats in the live scrod market are small day boats fishing with hooks relatively close to shore, and they would be most affected by nearshore area closures. Each of these boats supports one to three people shoreside to bait hooks. Hence, additional measures proposed in this framework adjustment (area closures and trip limits) could exacerbate the negative impacts on these vessels and their communities.

The Council concurred with the Groundfish Committee and Advisory Panel recommendation to develop Framework 31 based on the industry proposal for 30-day blocks out of the fishery out of the multispecies fishery. Since this is a proposal developed by a broad spectrum of affected fishermen, some of the social impacts of the needed conservation restrictions are likely to be minimized. Management measures that are proposed by the industry and adopted by the Council are more widely accepted among the industry than management measures developed solely by the Council. Compliance rates are higher when fishermen feel that they are being heard rather than being left out of the decision-making process, and when they believe in the efficacy and fairness of the regulations.

Nevertheless, the proposed measures will require fishermen and their communities to adjust to the restrictions and changes contained in this framework. How those adjustments will affect individuals, their families or communities varies with a number of factors, such as their dependence on GB cod and their ability to increase the value of the reduced catch or to shift effort to other fisheries to maintain a stream of revenues. These impacts, however, need to be considered in the context of the no-action alternative where the GB cod fishery is projected to decrease, potentially to levels requiring more severe action in the future. Further declines in stock levels resulting from no-action, or insufficient action, would lengthen the recovery periods and, therefore, the period over which there would be negative social and community impacts. In addition, the social impacts of taking action at a later date are likely to be more widespread and severe.

Qualitatively, therefore, the Council recognizes that there may be short-term social hardships resulting from the action, but it notes that these impacts are not significantly different from what was predicted in Amendment 7. Long-term, the Council expects that any social impacts will be positive in comparison to taking no action because of the benefits of rebuilding the resource base of the fishery and the harm that would result from allowing stock declines to continue.

5. Applicable law

5.1 Magnuson-Stevens Act (FCMA)

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 is part of the ongoing stock rebuilding program established by Amendment 7. The fishing mortality target for Georges Bank cod, which this action is designed to achieve, will continue the stock rebuilding, although further conservation restrictions may be needed in the future to achieve maximum sustainable yield in ten years or less as required by the SFA. The Council is addressing the SFA rebuilding for all stocks in the Multispecies FMP in Amendment 13 now in development.

2. *Conservation and management measures shall be based on the best scientific information available.*

This action is based on a stock assessment conducted in July, 1998, SAW 27, and updated by the Multispecies Monitoring Committee in December.

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.*

This action focuses on Georges Bank cod, and particularly on the areas and times when catch rates are highest. It also covers an area that lies along the boundary between the Georges Bank stock and the severely depleted Gulf of Maine stock, providing a buffer zone during a high catch period for both stocks.

4. *Conservation and management measures shall not be discriminated 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.*

This action does not discriminate between residents of different states. It also does not allocate fishing privileges, although, as with any action, the distribution of impacts of the proposed area

closure are proportional to individual fishermen's historical dependence on the fisheries encompassed by it. The Council's decision to use area closures is partly the result of its desire to focus the conservation measure on the time and area where it will be most effective, while minimizing impacts on other fisheries. The Council also considered that large offshore portions of the GB cod stock area have been closed since 1994.

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.*

The Council has chosen a focused conservation measure, an area closure, rather than more broadly based alternatives, such as DAS reductions, in part because it allows for the greatest amount of fishing opportunity within the constraints of the conservation objectives and other considerations. Short-term area closures are efficient management measures, provided they meet the conservation requirements of the plan, because they allow for continued fishing opportunity outside the time and area of the closure.

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

The Council proposes this action to achieve the conservation requirements of the plan while retaining opportunity for vessels to continue with other fisheries or fishing activities outside of the time and area of the closure. It also has provided exemptions for some fisheries, those that catch only insignificant amounts of regulated species, to continue within the area. Furthermore, it has included an exemption for scallop dredge vessels, which catch minimal quantities of cod, and continues the exemption for the recreational sector, which are managed under a separate set of regulations.

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 as well as enforcement and administrative costs in selecting the proposed action. Other alternatives either impose unnecessary costs on some sectors of the industry or they are costly or difficult to enforce.

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.*

The Council considered the impact on fishing communities of various alternatives that would achieve the conservation goals of the plan. In that regard, it chose to develop an industry-based plan to be implemented as soon as practicable, but it also recognized the need for immediate conservation measures that could be implemented in the interim.

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 area closure proposed in this framework is neutral with respect to its impact on bycatch or bycatch mortality. The trip limit, which is scheduled to take effect only if Framework 31 is not approved, implementing 30-day blocks out of the fishery, may result in increased discards of cod if vessels do not modify their fishing to avoid catching cod. Since there is an economic incentive to avoid catching and discarding a marketable species, and based on past experience with trip limits, the Council expects that vessels will shift their effort to other species or times and areas when catch rates are expected to be within the limits.

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

The affected public regularly comments on safety aspects of various alternatives under consideration by the Council. In the case of this framework, the alternatives under consideration, area closures, trip limits, and DAS reductions are essentially equivalent with respect to promoting safety.

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 which 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. This FMP provides for timely adjustment to management measures to rebuild overfished stocks to levels that will produce maximum sustainable yield based on the most recent and best scientific information available. The target TACs for the critical stocks represent optimum yield for those stocks which are the primary focus of the rebuilding plan. The FMP also specifies a target TAC for the group of other regulated species in the multispecies fishery management unit that are not individually managed. As future conditions warrant, the Council may adopt individual rebuilding target fishing mortality rates based on the overfishing definition control rules which will facilitate the calculation of annual yield targets for individual 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. The Groundfish Committee has begun a review of current fishing capacity and future capacity under rebuilt stock conditions in Amendment 13.

(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 is an extremely difficult issue to resolve in addressing cod rebuilding because the areas 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. The Council 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;

The Council has undertaken a major effort to bring all of its FMPs into compliance with this requirement. NMFS approved Amendment 11, addressing the essential fish habitat requirements of the SFA, on March 3, 1999.

(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 overfishing definitions submitted 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 also initiated Amendment 13 to address the rebuilding programs for all species in the fishery management unit.

(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, exempted fishery programs based on minimum bycatch standards for regulated species, and the GOM cod trip limit “running clock” that allows vessels to land rather than discard trip limit overages (although the Council is considering eliminating the running clock because the measure allows vessels to exceed the trip limit and circumvent its conservation benefit).

(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. Data and information contained in this Framework, particularly in the Environmental Assessment and the Regulatory Impact Review are supplemental to the baseline information contained in the earlier amendments.

(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. It has noted that recreational and party/charter landings have declined proportionally relative to the required reductions in fishing mortality needed to achieve plan goals and that it will monitor the recreational fishery 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 (FSEIS) indicated that the impacts of Amendment 7 would be significant, particularly the positive biological and long-term economic impacts of rebuilding the stocks. The assessment of environmental impacts of the proposed action is conducted in the context of the impacts projected for Amendment 7. The following table shows Amendment 7 projected cod landings for 1996-1998 under the status quo and rebuilding program, as well as actual landings recorded. It illustrates how, in broad terms of all cod fisheries, the anticipated impacts have not yet been realized. Proposed combined TACs for cod in Framework 27, for which the current framework is a follow-on action, correspond to the 1997 projected landings had Amendment 7 goals been achieved.

(1,000 metric tons)	1995 Projections in Amendment 7		Landings
	Status Quo	Amendment 7	
Year			
1996	12.7	11.3	14.4
1997	11.8	5.4	13.0
1998	11.0	7.2	10.4

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 (and Appendices) 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 because it is designed to achieve the Amendment 7 rebuilding target fishing mortality rate.

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

As discussed in Section 4.1.4 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 which 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 4.1.3, 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. Taking no action would result in adverse impacts on the fishery, particularly a decline in stock biomass and reduced yields. 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 management program to rebuild the stocks.

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 (EO) 12866 and the Regulatory Flexibility Act (RFA). The statement of the problem and the need for management are described in earlier parts of this document, in Section 1.2, Background, and Section 2.1, Purpose and Need. The alternatives to the proposed regulatory action, including the no-action alternative, are described in Section 3.0. The economic impacts are described in Section 4.2, and summarized below under the discussion of how the proposed action is characterized under EO 12866 and the RFA.

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 30 proposed action is developed as a part of the adjustment process to ensure that rebuilding goals of Amendment 7 are met on a continuing basis. Specifically, the Framework 30 measures are proposed to adjust the fishing mortality rate of the Georges Bank cod fishery to targets established in Amendment 7. 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 proposed action will likely reduce GB cod landings and revenues by approximately 18 percent from its 1998 levels. The revenues from other species may be reduced as well to a degree determined by the ability of the vessels to recover their losses by shifting effort to other areas during the period of closure or by targeting other species, such as Georges Bank haddock or yellowtail flounder which are experiencing increased allowable catches under the rebuilding plan.

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 area closures and cod trip limit, if implemented, 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.

The short-term impacts will be a maximum revenue loss of \$0.5 - \$1.0 million compared to 1997 level after accounting for displacement of effort to open areas (Table 11 in section 4.2.1). 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 have already been used to manage fisheries in the Northeast.

5.3.2 Regulatory Flexibility Act (RFA)

The purpose of the RFA is to reduce the impact of burdensome regulations and record-keeping requirements on small entities (small businesses, organizations or governments). The RFA applies to any rule or regulation that must undergo “notice and comment” under the Administrative Procedures Act, specifically those rules published as proposed rules. The Council is submitting this action with a recommendation and justification to publish the proposed action as a final rule, therefore, the action is not subject to the requirements of the RFA.

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 proposed action may affect, but is not likely to jeopardize the continued existence of any endangered and threatened species. The Council recognizes that this conclusion does not change the basis for the previous determination that overall operation of

fisheries under the Northeast Multispecies FMP, without modification, is likely to jeopardize the continued existence of endangered species under NMFS jurisdiction or result in adverse modification of critical habitat. 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)

This action contains no new collection-of-information requirements.

5.7 Marine Mammal Protection Act (MMPA)

The Council has reviewed the impacts of Framework 30 on marine mammals (Section 4.1.3) 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.

APPENDIX I
Draft Final Rule

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. ; I.D.]

RIN

50 CFR Part 648

Fisheries of the Northeastern United States; Northeast

Multispecies Fishery; Framework 30 to the Northeast

Multispecies Fishery Management Plan

AGENCY: National Marine Fisheries Service (NMFS), National
Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues this final rule to implement measures contained in Framework 30 of the Northeast Multispecies Fishery Management Plan (FMP). This action is necessary to reduce fishing mortality on Georges Bank (GB) cod to achieve the rebuilding goals of the FMP. This final rule implements management measures that include: a 30-day closure of areas on Georges Bank, and, starting August 15, 1999, a cod trip limit of 2,000 pounds per day with a maximum possession limit of 20,000 pounds and with authority for the NMFS Regional Administrator to adjust that limit depending on the risk of

exceeding, or not catching 75 percent of the target total allowable catch (TAC).

DATES: Comments must be received on or before [insert XX days after date of publication in the FEDERAL REGISTER].

ADDRESSES: Copies of the Framework 30 document, its Regulatory Impact Review (RIR), the Environmental Assessment (EA), and other supporting documents for the FMP amendment are available from Paul J. Howard, Executive Director, New England Fishery Management Council, 5 Broadway (Route 1), Saugus, Massachusetts 01906-1036.

FOR FURTHER INFORMATION CONTACT: [ADD].

SUPPLEMENTARY INFORMATION:

BACKGROUND

Amendment 7, which became effective on July 1, 1996, established a procedure for annually reviewing the FMP and making adjustments to management measures to achieve the rebuilding objectives. The Council conducted the third review during December, 1998 and January, 1999, and submitted proposed measures in Framework 27 to address the severely depleted Gulf of Maine cod stock. The Council was unable to

complete development of measures to reduce fishing mortality on GB cod the needed 22 percent to achieve the $F_{0.1}$ objective for that stock, as indicated in the Multispecies Monitoring Committee's annual report. This action, therefore, is a continuation of the annual adjustment procedure initiated with Framework 27.

ABBREVIATED RULEMAKING

NMFS is making these revisions to the regulations under the framework abbreviated rulemaking procedure codified at 50 CFR part 648, subpart F. This procedure requires the Council, when making specifically allowed adjustments to the FMP, to develop and analyze the actions over the span of at least two Council meetings, where comments are accepted. The Council must provide the public with advance notice of both the framework proposals and the associated analysis, and provide an opportunity to comment on them specifically prior to and at the second Council meeting. Upon review of the analysis and public comment, the Council may recommend to the Administrator, Northeast Region, NMFS, that the measures be published as a final rule, or as a proposed rule if additional public comment is necessary.

The initial and final meetings for Framework 27 were on December 10, 1998, and January 27-28, 1999, respectively. During these meetings the Council focused its efforts on

developing measures to reduce fishing effort on GOM cod, which scientific information indicated was collapsing. To avoid any delay in implementing management measures to protect GOM cod, the Council initiated a separate framework, Framework 30, to address GB cod. The initial and final meetings for Framework 30 were February 24-25, 1999 and April 14-15, 1999, respectively. The Council's Groundfish Committee and Industry Advisory Panel also held meetings and took public comment on the proposals on March 22 and 23, 1999.

At the joint meeting of the committee and advisory panel, which was following the initial framework meeting, the Council received a new proposal from a group of fishing industry representatives. The Council decided that it could not delay further the implementation of GB cod protection measures so it continued development of the measures for this framework, and at the same time began development of another framework, Framework 31, to consider the industry proposal. This framework, therefore, contains a primary measure, a one-month area closure, that will be in effect in the interim until Framework 31 is implemented, and a fall-back measure, a cod trip limit, that will take effect on August 15, if Framework 31 is not implemented.

Documents summarizing the Council's proposed action and the analysis of biological, economic and social impacts of

this and alternative actions were available for public review 1 week prior to the final meeting, as is required under the framework adjustment process. Written comments were accepted up to and during that meeting.

SUMMARY OF APPROVED MEASURES

In summary, this rule will close an area of Georges Bank off Cape Cod, for 30 days to vessels using gear capable of catching groundfish, with an exception made for vessels using scallop dredge gear, and on August 15, 1999 will set a daily limit of cod on vessels not enrolled in the Gulf of Maine Cod Trip Limit Exemption Program of 2,000 lb (907.2 kg) and a maximum limit of 20,000 lb (9,071.8 kg). The rule will also authorize the NMFS Regional Administrator to reduce the allowable landing or possession limit when 75 percent of the target TAC is reached to a level calculated to keep landings below the TAC, and, on or after January 1, 2000, to increase the limit, if there is a high probability that landings for the fishing year will be less than 75 percent of the TAC, to a level that would allow landings to achieve at least 75 percent of the TAC.

Comments and responses

Comment 1: Many members of the fishing industry, particularly from Cape Cod and New Bedford, representing all of the major gear sectors, as well as the U.S. Coast Guard

spoke out strongly against the use of a trip limit because it would cause discards, be difficult and costly to enforce and would not necessarily produce the desired result.

Response: The Council considered a wide range of alternatives to achieve the plan objectives. It adopted the GB cod trip limit as a contingency measure in case an alternative proposal put forth by the affected industry and contained in Framework 31 is not implemented by August 15. The Council chose this measure because, unlike area closures and days-at-sea reductions, it focuses the needed conservation restrictions on the vessels targeting cod, with minimal impact on vessels targeting other regulated species. The Council did not include a running clock, in part out of concern for its enforceability, and also because it enables vessels to circumvent the conservation benefits. By including both a possession limit and a per-day limit, the Council reduced the potential for discards, especially on trips where vessels that exceed the per-day limit can move or fish in other ways to reduce the incidental catch of cod while targeting other species. The Council also provided authority to the NMFS Regional Administrator to adjust the trip limit to reduce the risk of exceeding the target TAC.

Comment 2: Several members of the fishing industry, as well as representatives of an organization claiming at least

500 supporters, asked the Council to seek a closure of the multispecies fishery on Georges Bank in May through Secretarial emergency action. The commenters expressed concern that not implementing such a measure during the peak period of cod landings would result in a succession of more severe restrictions in the future.

Response: The Council determined that the present condition did not meet the requirements of an emergency action, and that it could not justify circumventing the normal framework process that allows all the affected public to comment on the alternatives and analysis of impacts. It did, however, submit the framework document with a recommendation and justification that the action be published as a final rule, consistent with the provisions of the framework adjustment procedure.

Comment 3: Members of the affected fishing industry and their representatives urged the Council to consider a plan that they had drafted through a number of meetings and an outreach program that included all gear sectors, as well as fish processors and dealers. This plan called for a mandatory 30-day block out of the multispecies fishery during each quarter, reductions in the amount or size of gear fished, and an increase in the minimum size of cod.

Response: The Council agreed to consider this proposal and develop it as a separate framework adjustment, Framework 31, that would supplant the trip limit scheduled to take effect on August 15. The final framework meeting for this proposal is scheduled for May 26-27, 1999, and, pending approval, the document would be submitted as soon after the meeting as possible.

Comment 4: Several members of the fishing communities on Cape Cod stated that the alternatives under consideration by the Council would disproportionately impact small, inshore vessels and their communities.

Response: The Council noted that the offshore cod fisheries have been affected by year-round area closures and restrictive days-at-sea allocations since 1994. It acknowledged that the proposals under consideration would affect the inshore grounds, but noted that that is where the predominance of cod landings have come from in recent years. Based on these comments, however, the Council adopted an area closure that covers both inshore and offshore grounds for a relatively short duration, and also agreed to proceed with the development of an alternative proposal made by many of the same commenters in a separate framework adjustment, Framework 31.

Classification

Notice and opportunity for public comment were provided to discuss the management measures implemented by this rule. Comments were received from members of the fishing industry and are responded to in the preamble of this rule. Therefore, the Assistant Administrator for Fisheries, NOAA (AA), under 5 U.S.C. 553(b)(B), finds for good cause that additional opportunity for public is unnecessary. Because of the need to implement conservation measures as close to the GB cod peak landings period as practicable, the AA also finds under 5 U.S.C. 553 (b)(B) that it would be contrary to the public interest to delay this rule in order to provide further notice and further opportunity for public comment.

Because of the need to implement conservation measures as close to the GB cod peak landings period as practicable, the AA also finds under 5 U.S.C. 553 (d)(3) that there is good cause to waive part of the 30-day delay in effectiveness of this regulation. Notably, a broad-based industry group requested in public comments and correspondence that the Council request Secretarial emergency action to implement conservation measures for GB cod in May or as close to the peak season as possible to avoid more severe restrictions becoming necessary in the future.

Because prior notice and opportunity for public comment are not required for this rule by 5 U.S.C. 553, or any other

law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C.601 *et seq.*, are inapplicable. Consequently, no regulatory flexibility analysis has been prepared.

This final rule has been determined to be not significant for the purposes of E.O. 12866.

List of Subjects in 50 CFR Part 648:

Commercial Fisheries, Fish, Fisheries.

Dated:

For the reasons stated in the preamble, 50 CFR Part 648 is proposed to be amended as follows:

PART 648 - FISHERIES OF THE NORTHEASTERN UNITED STATES

1. The authority citation for Part 648 continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq.*

2. [ADD prohibitions]

3. In Section 648.81, paragraph (p) is added to read as follows:

§648.81 Closed Areas.

* * * * *

(p) 1999 Georges Bank Seasonal Closure Area.

(1) From [INSERT DATE OF EFFECTIVENESS], 1999 through [INSERT DATE, 30 DAYS AFTER DATE OF EFFECTIVENESS], 1999, no fishing vessel or person on a fishing vessel may enter, fish in, or be in, and no fishing gear capable of catching multispecies, unless otherwise allowed in this part, may be in, or on board a vessel in, the area known as the 1999 Georges Bank Seasonal Closure Area, as defined by straight lines connecting the following points in the order stated, except as specified in paragraphs (d) and (p)(2) of this section. A chart depicting this area is available from the Regional Administrator upon request (see Table 1 to §600.502).

1999 Georges Bank Seasonal Closure Area [DATES, 1999]

Point	N. Lat.	W. Long.
GB1	41°00'	70°00'
GB2	41°00'	69°30'
GB3	41°30'	69°30'
GB4	41°30'	67°00'
GB5	42°00'	67°00'

GB6	42°00'	70°00'
GB7	(1)	70°00'
GB8	(2)	70°00'
GB9	(3)	70°00'
GB10	(4)	70°00'
GB1	41°00'	70°00'

- 1 Cape Cod shoreline on the Atlantic Ocean.
- 2 Cape Cod shoreline on Nantucket Sound.
- 3 Nantucket Island shoreline on Nantucket Sound.
- 4 Nantucket Island shoreline on the Atlantic Ocean.

(2) Paragraph (p)(1) of this section does not apply to persons on fishing vessels or fishing vessels:

(i) that meet the criteria in paragraph (g)(2)(ii), or (iii), of this section,

(ii) that are fishing with or using scallop dredge gear when fishing under a scallop DAS or when lawfully fishing in the Scallop Dredge Fishery Exemption Area as described in §648.80(a)(10).

4. In Section 648.86, paragraph (b) is revised to read as follows:

§648.86 Possession and landing restrictions.

* * * * *

(b)* * *

(2) *Exemption.* (i) A vessel fishing under a NE multispecies DAS is exempt from the landing limit described in paragraph (b)(1) of this section when fishing south of a line beginning at the Cape Cod, MA coastline at 42° 00' N. lat. and running eastward along 42° 00' N. lat. until it intersects with 69° 30' W. long., then northward along 69° 30' W. long. until it intersects with 42° 20' N. lat., then eastward along 42° 20' N. lat. until it intersects with 67° 20' W. long., then northward along 67° 20' W. long. until it intersects with the U.S.-Canada maritime boundary, provided that it does not fish north of this exemption area for a minimum of 30 consecutive days (when fishing under the multispecies DAS program), and has on board an authorization letter issued by the Regional Administrator. Vessels exempt from the landing limit requirement may transit the GOM/GB Regulated Mesh Area north of this exemption area, provided that their gear is stowed in accordance with one of the provisions of §648.81(e).

(ii) Beginning August 15, 1999, a vessel that is exempt from the landing limit described in paragraph (b)(1) of this section fishing under a NE multispecies

DAS may land up to 2,000 lb(907.2 kg) of cod per DAS fished, or any part of a DAS fished, up to 20,000 lb (9,071.8 kg)per trip, provided it has one standard tote on board. Cod on board a vessel subject to this landing limit must be separated from other species of fish and stored so as to be readily available for inspection.

(iii) When the Regional Administrator projects that 75 percent of the target TAC will be harvested (8.9 million lb (4,012 mt) for the 1999 fishing year), NMFS may publish a notification in the Federal Register that, as of a specific date, the limit specified in paragraph (b)(2)(ii) of this section is reduced to a level to be determined based on the risk of exceeding the target TAC. Cod on board a vessel subject to this landing limit must be separated from other species of fish and stored so as to be readily available for inspection.

(iv) Paragraph (b)(2)(iii) of this section notwithstanding, beginning January 1, 2000, through April 30, 2000, if the Regional Administrator projects that less than 75 percent of the target TAC (8.9 million lb (4,012 mt) for the 1999 fishing year) by April 30, 2000, NMFS may publish a notice in the Federal Register that, as of a specific date, the limit is increased to the amount that the Regional Administrator projects will be

sufficient to allow harvesting of at least 8.9 million lb (4,012 mt) by April 30, 2000. Cod on board a vessel subject to this landing limit must be separated from other species of fish and stored so as to be readily available for inspection.

APPENDIX II
10-year Rebuilding Projection
Georges Bank Cod

PROJECTION RUN: GB Cod MMC 1998 Proj. Bmsy

INPUT FILE: gbc98hb.in

OUTPUT FILE:

gbc98hb.out

RECRUITMENT MODEL: 9

NUMBER OF SIMULATIONS: 100

MIXTURE OF F AND QUOTA BASED CATCHES

YEAR	F	QUOTA (THOUSAND MT)
1998		8.243
1999	.180	
2000	.180	
2001	.180	
2002	.180	
2003	.180	
2004	.180	
2005	.180	
2006	.180	
2007	.180	

BIOMASS (THOUSAND MT)

YEAR	AVG B (000 MT)	STD
1998	38.277	3.870
1999	41.260	4.621
2000	44.454	5.255
2001	46.837	6.010
2002	52.545	8.766
2003	58.810	11.838
2004	64.805	14.999
2005	72.091	17.981
2006	82.594	20.891
2007	93.324	23.464

PERCENTILES OF TOTAL STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
1998	30.019	32.041	33.234	35.531	38.278	40.807	43.197	44.346	47.823
1999	31.051	33.723	35.328	38.091	41.224	44.361	47.094	48.847	52.661
2000	32.323	35.749	37.674	40.889	44.465	48.051	51.146	53.018	56.578
2001	32.635	36.752	38.988	42.770	46.951	51.041	54.477	56.498	60.142
2002	34.303	39.246	41.997	46.717	52.017	57.551	63.253	68.059	78.660
2003	36.029	42.033	45.248	50.861	57.483	64.891	74.185	81.766	93.712
2004	37.636	44.297	48.013	54.537	62.560	72.443	85.437	93.890	108.812
2005	40.302	47.866	52.116	59.572	69.065	81.547	97.260	106.497	125.036
2006	45.315	54.001	58.822	67.797	79.392	94.371	111.319	121.620	143.373
2007	50.599	60.278	65.957	76.560	90.212	107.231	125.017	136.544	159.334

ANNUAL PROBABILITY THAT BIOMASS EXCEEDS THRESHOLD: 108.000000 THOUSAND MT

YEAR	Pr(B > Threshold Value)
1998	.000
1999	.000
2000	.000
2001	.000
2002	.000
2003	.001
2004	.011

2005	.045
2006	.122
2007	.242

RECRUITMENT UNITS ARE: 1000.000000 FISH

BIRTH YEAR	AVG RECRUITMENT	STD
1998	6526.197	3374.586
1999	6512.058	3374.340
2000	6504.261	3377.142
2001	10794.110	9115.443
2002	10776.620	9047.903
2003	10793.930	9132.504
2004	10757.650	9025.830
2005	16672.870	11192.840
2006	16609.530	11119.390
2007	16552.790	11150.570

PERCENTILES OF RECRUITMENT UNITS ARE: 1000.000000 FISH

BIRTH YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
1998	424.000	424.000	424.000	3523.000	6456.000	10116.000	10844.000	10844.000	10844.000
1999	424.000	424.000	424.000	3523.000	6456.000	10116.000	10844.000	10844.000	10844.000
2000	424.000	424.000	424.000	3523.000	6456.000	10116.000	10844.000	10844.000	10844.000
2001	424.000	424.000	3523.000	6246.000	8682.000	10844.000	19176.000	23486.000	42813.000
2002	424.000	424.000	3523.000	6246.000	8682.000	10844.000	19176.000	23486.000	42813.000
2003	424.000	424.000	3523.000	6246.000	8682.000	10844.000	19176.000	23486.000	42813.000
2004	424.000	424.000	3523.000	6246.000	8682.000	10844.000	19176.000	23486.000	42813.000
2005	424.000	3523.000	6246.000	8682.000	15800.000	23486.000	27714.000	41394.000	42813.000
2006	424.000	3523.000	6246.000	8682.000	15800.000	23486.000	27714.000	41394.000	42813.000
2007	424.000	3523.000	6246.000	8682.000	15800.000	23486.000	27714.000	41394.000	42813.000

LANDINGS FOR F-BASED PROJECTIONS

YEAR	AVG LANDINGS (000 MT)	STD
1998	8.252	.009
1999	7.270	.811
2000	7.362	.803
2001	7.294	.854
2002	8.048	1.162
2003	8.657	1.394
2004	9.670	2.004
2005	11.338	3.005
2006	12.654	3.630
2007	14.082	4.118

PERCENTILES OF LANDINGS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95 %	99%
1998	8.243	8.243	8.243	8.243	8.243	8.243	8.243	8.243	8.243
1999	5.546	5.996	6.218	6.685	7.254	7.792	8.279	8.576	9.278
2000	5.698	6.097	6.340	6.793	7.343	7.892	8.368	8.686	9.433
2001	5.349	5.888	6.191	6.712	7.294	7.869	8.379	8.679	9.340
2002	5.286	6.046	6.493	7.259	8.101	8.880	9.516	9.873	10.501
2003	5.326	6.272	6.814	7.711	8.700	9.653	10.425	10.859	11.625
2004	5.513	6.646	7.260	8.340	9.549	10.795	12.098	13.222	15.705
2005	6.065	7.358	8.094	9.357	10.877	12.689	15.138	17.540	20.845
2006	6.529	7.957	8.754	10.179	11.972	14.354	17.822	20.001	23.513
2007	7.145	8.726	9.624	11.189	13.283	16.177	19.979	22.037	26.421

10-year projection of Georges Bank cod biomass and landings. Results indicate a 24 percent probability that biomass will exceed the 108,000 threshold for maximum sustainable yield in 2007 if fishing mortality is held at $F=0.18$, the Amendment 7 target.

**APPENDIX III
WRITTEN COMMENTS**

