

If the Council had selected Option 2, it would have considered whether or not to require participants to obtain a letter of authorization for this fishery (for the entire season). The area proposed for the raised footrope trawl fishery is contained within the current small mesh exemption area, so if the Council had decided *not* to require letters of authorization under this option, then the raised footrope trawl fishery could have been administered and enforced in the same manner as Small Mesh Areas 1 and 2. Although it is an additional administrative burden, requiring letters of authorization for this fishery allows for better monitoring (number of participants) and increases the enforceability of the exemption.

Analysis of this option is contained in Section 5.1.3.1.4 of this framework document. The Council rejected Option 2 based on recommendation of the Groundfish PDT and based on subsequent analyses suggesting that this option would have a greater impact on some large mesh regulated species than Option 1. Analyses supporting this conclusion (as well as additional discussion) are provided in Section 5.1.3.1.4.

#### **4.0 AFFECTED ENVIRONMENT**

The physical, biological, and human environment affected by the actions proposed in this framework adjustment are described in detail in Amendment 12 (whiting) to the Northeast Multispecies FMP. Section E.6.3 of the Amendment 12 document describes the affected physical environment and habitat. Section E.6.4 describes the affected biological environment, including life history and stock assessment information for the small mesh multispecies stocks. Section E.6.5 of Amendment 12 describes the affected human environment and includes biological, economic, and social characterizations of small mesh multispecies fisheries occurring throughout the region. Where necessary, portions of the descriptive information presented in Amendment 12 have been reproduced in this framework document.

#### **5.0 ANALYSIS OF IMPACTS**

##### **5.1 BIOLOGICAL IMPACTS**

The following sections present a biologically-based assessment of the potential impacts of exempting the raised footrope trawl fishery on the northern stocks of whiting and red hake as well as on regulated groundfish species and other non-target species. Analysis of both the proposed action and the alternative considered and rejected (for the adjustment to the “rolling

##### **5.1.1 Impacts on the Northern Stocks of Silver Hake and Red Hake**

The following characterizes the potential impact of the raised footrope trawl fishery on the northern stocks of silver hake and red hake. This fishery occurred on an experimental basis from 1995-1999, and landings from the fishery during 1995-1997 were incorporated into the Amendment 12 (whiting management program) analysis. The complete analysis of the whiting management and rebuilding program is contained in Section E.7.2 of the Amendment 12 document.

According to the Amendment 12 overfishing definition for whiting:

*Silver hake is overfished when the three-year moving average of the autumn survey weight per tow is less than 3.31 kg/tow and 0.78 kg/tow for the northern and southern stocks respectively, one half of the  $B_{MSY}$  proxy (the average observed from 1973 – 1982). If an analytical assessment (e.g. VPA) for silver hake is available, the three-year moving average will be replaced with the terminal year biomass estimate and compared with the mean biomass estimated for 1973 – 1982.*

*Overfishing occurs when fishing mortality, derived from the latest three years of survey data, exceeds  $F_{0.1}$  (0.41 and 0.39 for the northern and southern stocks of silver hake respectively). If an analytical assessment is available, then the terminal year fishing mortality rate will be compared to  $F_{0.1}$ .*

*If silver hake are overfished, then the Council will take steps necessary to reduce fishing mortality below a level determined by a linear reduction of  $F$  between  $F_{proxy}$  at the  $B_{MSY}$  proxy and zero when biomass is at  $\frac{1}{2}$  of the  $B_{MSY}$  proxy. If overfishing is occurring, fishing mortality will be reduced to  $F_{0.1}$ , or lower when biomass is below the  $B_{MSY}$  proxy.*

According to the Amendment 12 overfishing definition for red hake:

*The northern stock of red hake is overfished when the three-year moving average of stock biomass, derived from the autumn survey, is below 1.6 kg/tow. If an analytical assessment is available for northern red hake, then the three-year moving average will be replaced with the terminal year biomass estimate and compared with the biomass reference points.*

*Overfishing occurs when the ratio between catch and survey biomass exceeds 0.65, the proxy for  $F_{MSY}$ . When biomass is less than 3.1 kg/tow (the biomass target), the stock is overfished when fishing mortality is above a rate that declines linearly to zero when biomass equals the minimum biomass threshold (1.6 kg/tow).*

*The overfishing definition control rule specifies risk averse fishing mortality targets, accounting for the uncertainty in the estimate of  $F_{MSY}$  or its proxy. If the three-year moving average of northern red hake stock biomass (derived from the autumn survey) is greater than or equal to 3.1 kg/tow, the fishing mortality target is 60% of the value of  $F_{MSY}$ , or 0.39. The fishing mortality target decreases linearly to zero when the three-year moving average of northern red hake stock biomass (derived from the autumn survey) declines to 1.6 kg/tow, the minimum biomass threshold.*

Based on the Amendment 12 overfishing definitions, the Council should reduce fishing mortality to  $F_{0.1}$  (0.41) for the northern stock of silver hake and 0.39 for the northern stock of red hake when overfishing is occurring. The management program implemented in Amendment 12 is intended to reduce fishing mortality to these target  $F$  levels. Analysis indicates that these target fishing mortality rates should be achieved through the Amendment 12 management measures, including the Year 4 default measure. Since the raised footrope trawl fishery occurred on an

experimental basis from 1995-1999, landings from the fishery during 1995-1997 were incorporated into the Amendment 12 analysis. The analysis assumed that landings in the raised footrope trawl fishery would continue to occur under the Amendment 12 management program at levels similar to those observed from 1995-1997. Therefore, continuation of the raised footrope trawl as an exempted fishery rather than an experimental fishery at effort levels similar to those from 1995-1997 should not alter the conclusions drawn in Amendment 12 relative to the potential success of the whiting management program.

Red hake is most often caught in combination with silver hake, and analysis suggests that the Amendment 12 management measures are likely to reduce fishing mortality on red hake to target levels. The projected exploitation rate reductions for red hake from the Amendment 12 analysis are similar to those of combined silver and offshore hake, indicating that the management measures should afford protection to small mesh multispecies as a group, not just to silver hake. The conclusion, therefore, that continuation of the raised footrope trawl as an exempted fishery rather than an experimental fishery is not likely to jeopardize the northern whiting management program also holds true for the conservation and management of the northern stock of red hake.

Whiting resource status is not likely to be adversely impacted by establishing a seasonal, raised footrope trawl fishery in Areas 2B and 4, provided that whiting landings do not increase substantially beyond yields taken in the 1999 experimental fishery (roughly 1,000 mt of whiting). This fishery is expected to harvest whiting from the northern stock of the whiting population. Abundance of the northern whiting stock is currently above average. The northern whiting biomass index from the autumn 1999 NEFSC survey is 11.64 kg per tow. The three-year moving average of the biomass index is 13.08 kg in 1999, which is well above the survey biomass threshold (3.31) and the survey biomass target (6.63) for the northern whiting stock, indicating that the northern stock of whiting is not overfished. Three-year moving averages of survey biomass indices for northern whiting have remained above threshold and target values throughout the 1990s. The apparent healthy status of the northern whiting stock is not likely to be affected by the small scale of landings in the proposed raised footrope trawl fishery.

Red hake resource status is also not likely to be adversely affected by the proposed fishery, provided that red hake landings do not increase substantially beyond yields taken in the 1999 experimental fishery. The proposed raised footrope trawl fishery is expected to harvest red hake from the northern stock of the red hake population. Abundance of the northern red hake stock is currently above average. The northern red hake biomass index from the autumn 1999 NEFSC survey is 3.32 kg per tow. The three-year moving average of the biomass index is 3.80 kg in 1999, which is above the survey biomass threshold (1.55) and the survey biomass target (3.10) for the northern whiting stock. Three-year moving averages of survey biomass indices for northern red hake have remained at or above the target value throughout the 1990s. The apparent healthy status of the northern red hake stock is not likely to be affected by the small scale of landings in the proposed raised footrope trawl fishery.

### **5.1.2 Potential for an Increase of Effort in the Exempted Fishery**

A significant expansion of effort in this exempted fishery well beyond historical levels *could* alter the above conclusions; however, effort in this fishery (characterized by landings) is unlikely to increase enough to compromise whiting fishing mortality objectives for several reasons:

- The proposed season for the raised footrope trawl fishery (September 1 – November 20) is shorter than the experimental seasons (September 1 – December 31). By decreasing the length of the season, the fishery loses approximately 19% of the 1999 estimated whiting catch and 50% of the 1999 estimated cod bycatch. (These estimates are based on sea sampling data that have been expanded to account for unobserved trips.) The 19% loss in whiting catch expected from a shorter season may offset an increase in effort in the fishery, resulting in little to no additional landings of whiting from the fishery.
- Whiting/offshore hake possession limits (7,500-pounds with 2.5-inch mesh and 30,000-pounds with 3-inch mesh) should discourage larger vessels and vessels with long travel times from entering the fishery. Whiting is generally a high-volume fishery, and vessels with larger operating costs are unlikely to be able to make profitable trips in this fishery.\*
- The proposed raised footrope trawl area encompasses a small geographical area close for vessels in and near Provincetown, almost all of which participated in the experimental fisheries. The long steam time and rapid perishability of the product is likely to discourage additional vessels from traveling long distances to participate in this fishery.\*
- As discussed in Section 5.1.3.1, large increases in effort are not expected because a substantial proportion of the fishery (more than 50%) is likely to occur within state waters (Figure 6), requiring a Massachusetts' Coastal Access Permit (limited access, with moratorium on new permits) and maximum vessel size of 72'.
- Analysis of continuing the whiting fishery as an open access fishery (see Appendix IV, NMFS, July 1, 1999) states the following:
  - "...although a flood of new entrants to the fishery could offset reductions in landings achieved by the trip limits, the imposition of a trip limit does not encourage new entrants to the small mesh multispecies fishery and would mitigate the impacts of any new entrants to the fishery."
  - "...although the possession limits may improve prices, the highly volatile market conditions, resulting in wide daily variations of prices, may control the number of vessels that would enter the fishery for the near term. This current market limitation would counter the expectation that vessels will flood the fishery due to increasing regulations in other fisheries."
  - "This (supplemental) analysis is predicated on the assumption that the implementation of an open access fishery will not result in a net increase in the number of fishery participants compared to current participation levels."
  - "The Year 4 default measure is projected to achieve the goal of ending overfishing in combination with other non-quantifiable measures even without a limited access permit program."
  - "In an open access permit system, it would be unlikely that participation in the fishery would increase more than marginally due to unstable market conditions of the fishery and restrictions on vessels by the (Amendment 12) management measures."

The above conclusions were drawn in the context of the whiting fishery as a whole. While participation in this raised footrope trawl fishery may increase, it is unlikely that this increased effort will compromise whiting fishing mortality objectives. New participation in the raised

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\* This assumes that vessels are not likely to temporarily relocate to a nearby port to participate in this fishery.

footrope trawl fishery will most likely be from vessels that have fished for whiting in the past (the cost of buying new gear may deter vessels that have *never* fished for whiting). These vessels are more likely to be shifting their effort on whiting from one small mesh fishing area to the raised footrope trawl area. While describing short-term expectations of the fishery as a whole, the above projections/conclusions would be expected to apply to the raised footrope trawl exempted fishery as well.

- If landings in this fishery during 2000 increase enough to potentially compromise the conservation objectives of the whiting management program, the Council can modify the season, area, and/or possession limits for this fishery through a framework adjustment, which could be implemented in time for the 2001 raised footrope trawl season (and still prior to Year 4 of the whiting management program).
- The Council has already expressed concern about continuing the small mesh multispecies fisheries as open access fisheries as well as its intent to develop another limited access program for small mesh multispecies in the near future. It is likely that the raised footrope trawl fishery (and other small mesh fisheries) will be subject to limited access permit restrictions for small mesh multispecies in the future.

### **5.1.3 Impacts on Other Species**

The following sections characterize the potential impact of this fishery on other commercial fish stocks in the northeast region, including regulated multispecies, dogfish, and herring. Analyses of the alternative that the Council rejected (for modifying the Framework 33 October/November closure) are also included.

#### **5.1.3.1 Impacts on Regulated Multispecies**

Establishing a seasonal whiting raised footrope trawl fishery in upper Cape Cod Bay will not significantly impact mortality or rebuilding schedules for any large mesh regulated groundfish stocks. The raised footrope trawl fishery has been ongoing as an experimental fishery since 1995 and has occurred during the 1999 October/ November rolling closure of blocks 124 and 125. The low absolute catches of large mesh regulated species projected for 2000 and the fact that the exempted fishery is more restricted in area and season than the experimental fishery in 1999 suggests that the raised footrope trawl fishery is unlikely to exert any additional mortality on large mesh regulated species. Large increases in effort are not expected because a substantial proportion of the fishery occurs within state waters (Figure 6), requiring a Massachusetts' Coastal Access Permit (limited access, with moratorium on new permits) and maximum vessel size of 72'. At minimum, Option 1 for adjusting the October/November closure, the proposed "neutral" relative to 1999 and actually may slightly reduce catches of large mesh regulated species. Information provided in the sections below supports these conclusions.

For enforcement purposes, the Commonwealth of Massachusetts is prepared to adopt complimentary regulations and have its Division of Environmental Law Enforcement (DELE) enforce state rules in state waters and dock-side. Furthermore, DELE and NMFS have an interagency Memorandum of Understanding allowing state officers to enforce federal groundfish regulations routinely. Contingent on available resources, DELE officers could patrol and enforce the restrictions in the federal waters portion of the raised footrope trawl exempted area. In addition, NMFS enforcement officers may be deployed on state patrol vessels in the federal

waters portion.

#### **5.1.3.1.1 Characterization of Regulated Multispecies Bycatch in the Experimental Raised Footrope Trawl Fishery**

The raised footrope trawl was designed to reduce catches of flatfish in the small mesh whiting fishery in Cape Cod Bay. By regulation, participants in the experimental fisheries must have discarded all large mesh regulated species. In addition to covering previous years, the Massachusetts Division of Marine Fisheries sea sampling program sampled 66 of 459 trips in the 1999 experimental fishery, the most extensive coverage to date. The bulk of the 1999 fishery (91%) occurred in Areas 2B and 4 (see Figure 1 in Section 1.3). DMF estimated the total bycatch of large mesh regulated multispecies in the 1999 experimental fishery by increasing the sea sampled catch per trip estimates by the ratio of total trips to observed trips. In other words, the observed bycatch was expanded to include estimates for non-observed trips. For some species with low discard rates in the sea sampling data, reported discards in the fleet's vessel trip reports were higher than the sea sampling estimates. For these species, discards were estimated using the vessel trip reports that Mass. DMF required participating fishermen to complete and submit on a weekly basis.

Total discard estimates by species in Areas 2B, 4, and 3 are shown in Table 3 and Table 4 respectively. Total (expanded) discards of all large mesh regulated species in the 1999 raised footrope trawl experimental fishery were estimated at 33.4 mt; only Gulf of Maine cod (11.9 mt), American Plaice (7.2 mt), Gulf of Maine winter flounder (5.7 mt), pollock (3.2 mt), and white hake (1.3 mt) exceeded 1 metric ton. A comparison of discards in the raised footrope trawl fishery with January – November 1999 landings for regulated species suggests that there is minimal impact on regulated species. The percentage of raised footrope trawl discards/ Jan-Nov 1999 landings by species ranged from 2.2% (Gulf of Maine winter flounder) to less than 0.01%.

Comparing discards to annual landings, or discards to the Target TACs of regulated species, is not entirely appropriate because the raised footrope trawl fishery is required to discard large mesh regulated species. Comparing raised footrope trawl fishery discards to total discards by species is more appropriate, but estimates of total large mesh regulated species discards are either imprecise or unknown. However, the percentage of raised footrope trawl fishery discards to total discards is below 1% for all species but Gulf of Maine cod. Gulf of Maine cod discard in the raised footrope trawl fishery was 5% of total discards for Gulf of Maine cod, but the total discard estimate (200 mt) for Gulf of Maine cod (SARC 27) was derived *prior* to implementing very restrictive trip limits (30-200 lbs.) for that stock and is likely to have been substantially higher in recent years.

**Table 3 Estimated (Expanded) Total Catch (mt) of Large Mesh Regulated Species in the 1999 Raised Footrope Trawl Fishery in Areas 2B and 4 Compared to Landings (mt) in Calendar Year 1999**

Species	American plaice	GOM Winter flounder	Witch flounder	Windowpane	Cape Cod YT	Redfish	White hake	GOM Haddock	Pollock	GOM cod
1999 Catch in RFT fishery (mt)	6.92	5.73	0.08*	0.07	0.91*	0.11	0.26	0.49	2.56	11.89
Jan-Nov 1999 landings <sup>1</sup> (mt)	2814.00	260.00	1922.00	43.00	845.00	322.00	2447.00	529.00	4152.00	1273.00
1999 catch as % of 1999 landings	0.25%	2.20%	<0.01%	0.16%	0.10%	0.03%	0.36%	0.09%	0.06%	0.93%
Most recent Discards <sup>2</sup> (mt)	900.00	N/A	334.00	N/A	75.00	N/A	200.00	N/A	N/A	200.00
1999 catch in RFT fishery as % of most recent discard estimate	0.76%		0.02%		1.21%		0.13%			5.95%

<sup>1</sup> January-April 1999 landings were taken from MSMC 1999 report; May-November landings were taken from preliminary data provided by the NERO as of 3/23/00.

<sup>2</sup> Discard information was taken from the July 1999 Northern Demersal working group Report or most recent SARC documents.

\* Catch estimate taken from state-issued vessel trip reports required by participating vessels for all trips in experimental fishery.

*For Cape Cod Yellowtail, the sea sampled catch estimate was 0.53 mt. For witch flounder, the sea sampled catch estimate was 0.00 mt.*

**Table 4 Estimated Total Catch (mt) of Large Mesh Regulated Species in the 1999 Raised Footrope Trawl Fishery in Area 3 Compared to Landings (mt) in Calendar Year 1999**

Species	American plaice	SNE/MA Winter flounder	Witch Flounder	Windowpane	Cape Cod YT	Redfish	White hake	Georges Bank Haddock	Pollock	Georges Bank cod
1999 Catch in RFT fishery (mt)	0.02	0.23*	0.06*	0.03*	0.11*	0.01*	1.02	0.03	0.01	0.31
Jan-Nov 1999 landings <sup>1</sup> (mt)	2814.00	3048.00	1922.00	43.00	845.00	322.00	2447.00	2232.00	4152.00	7827.00
1999 catch as % of 1999 landings	<0.01%	<0.01%	<0.01	0.07%	0.01%	<0.01	0.04%	<0.01%	<0.01%	<0.01%
Most recent Discards <sup>2</sup> (mt)	900.00	300	334.00	N/A	75.00	N/A	200.00	600.00	N/A	N/A
1999 catch in RFT fishery as % of most recent discard estimate	<0.01%	0.08%	0.02%		0.15%		0.51%	<0.01%		

<sup>1</sup> January-April 1999 landings were taken from MSMC 1999 report; May-November landings were taken from preliminary data provided by the NERO as of 3/23/00.

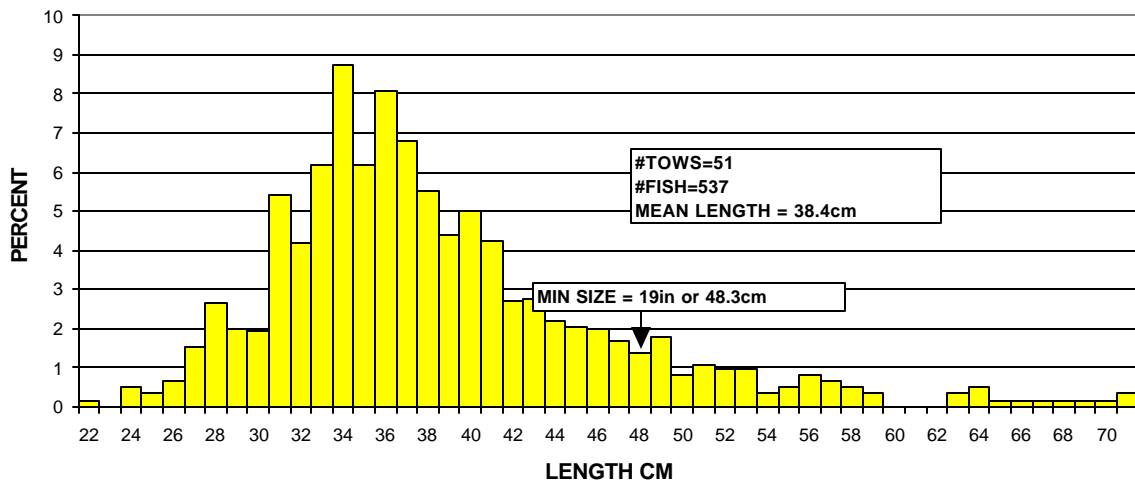
<sup>2</sup> Discard information was taken from either the July 1999 Northern Demersal working group Report or most recent SARC documents.

\* Catch estimate taken from state-issued vessel trip reports required by participating vessels for all trips in experimental fishery.

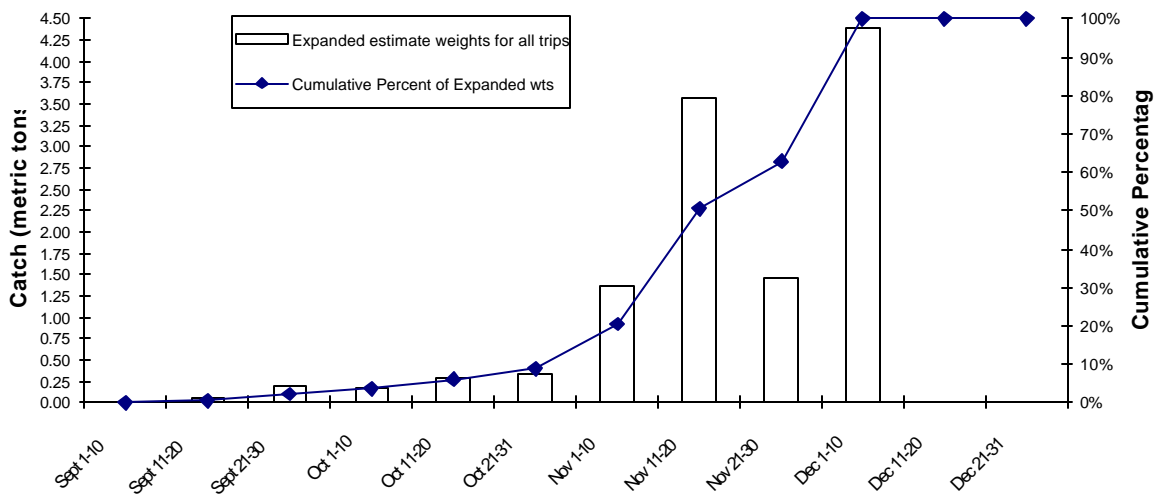
### 5.1.3.1.2 Areas 2B and 4

In Areas 2B and 4, the only species with expanded bycatch estimates greater than 1 mt in the 1999 experimental fishery were Gulf of Maine cod (11.89 mt), American Plaice (6.92 mt), and Gulf of Maine winter flounder (5.73). Discards of Gulf of Maine cod in this fishery were less than 0.93% of the total January-November 1999 landings. The length frequency of Gulf of Maine cod discards ranged from 22 cm to 72 cm with a mean length of 38.4 cm (Figure 10). The majority of the discards (by number) were below the 48 cm minimum size. Bycatch of Gulf of Maine cod in the experimental fishery increased after October 31, and one half of the total estimated Gulf of Maine cod bycatch occurred after November 20 (Figure 11, Table 5), which is the proposed closing date for the fishery.

**Figure 10 Length Frequencies of Gulf of Maine Cod Discards in 1999 Experimental Raised Footrope Trawl Fishery (Areas 2B and 4)**

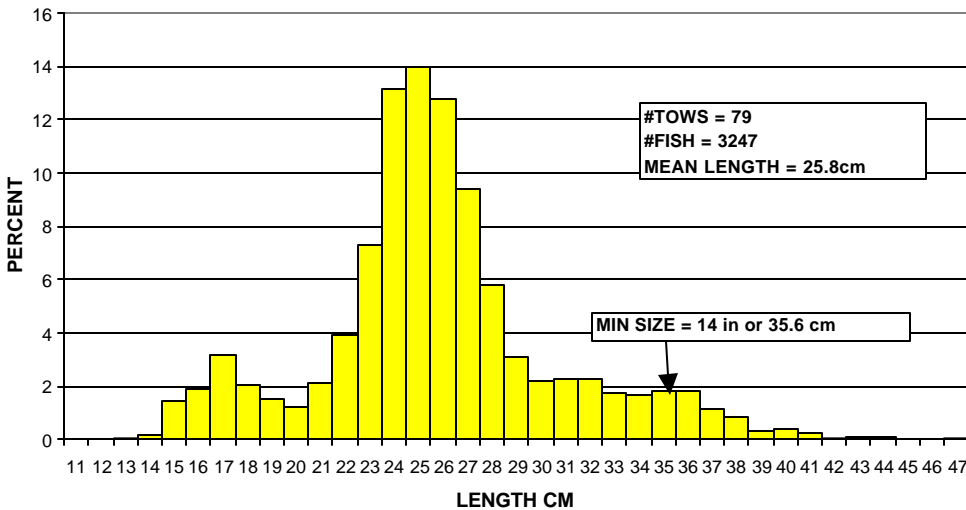


**Figure 11 Cumulative (Expanded) Gulf of Maine Cod Catch from 1999 Sea Sampling Data in Areas 2B and 4**

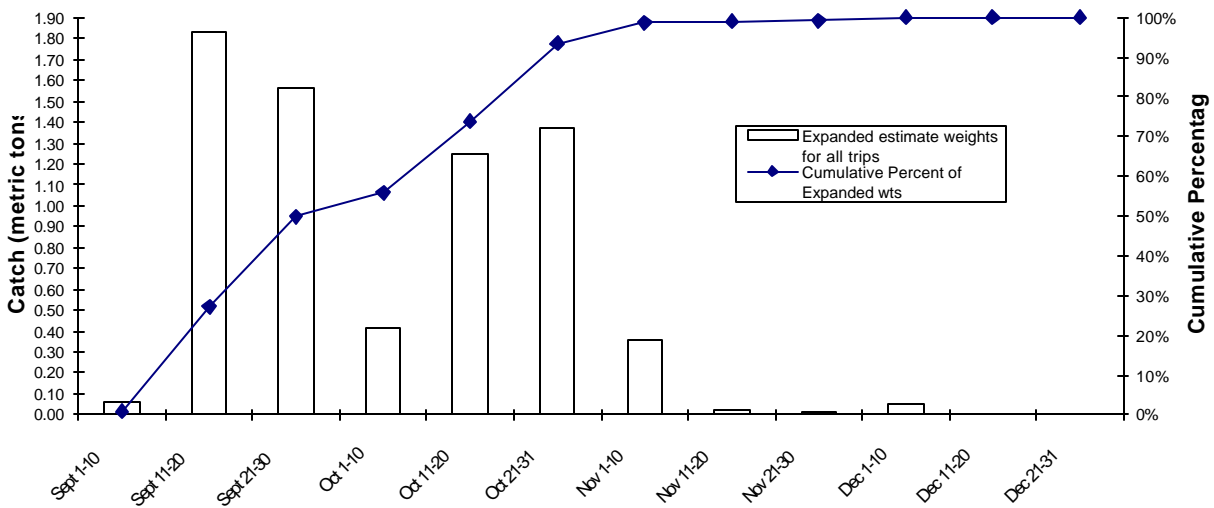


Discards of American Plaice in the 1999 experimental raised footrope trawl fishery were less than 0.25% of the total January – November 1999 landings. The length frequency of American Plaice discards ranged from 13 cm to 44 cm with a mean size of 25.8 cm (Figure 12). Most discards were below the 35.6cm minimum size. Unlike cod, discards were higher during mid- to late September with 50% of discards occurring during September when fishing was predominantly in deeper water in Upper Cape Cod Bay, *not* on or near Stellwagen Bank (Figure 13, Table 5).

**Figure 12 Length Frequencies of American Plaice Discards in 1999 Experimental Raised Footrope Trawl Fishery (Areas 2B and 4)**

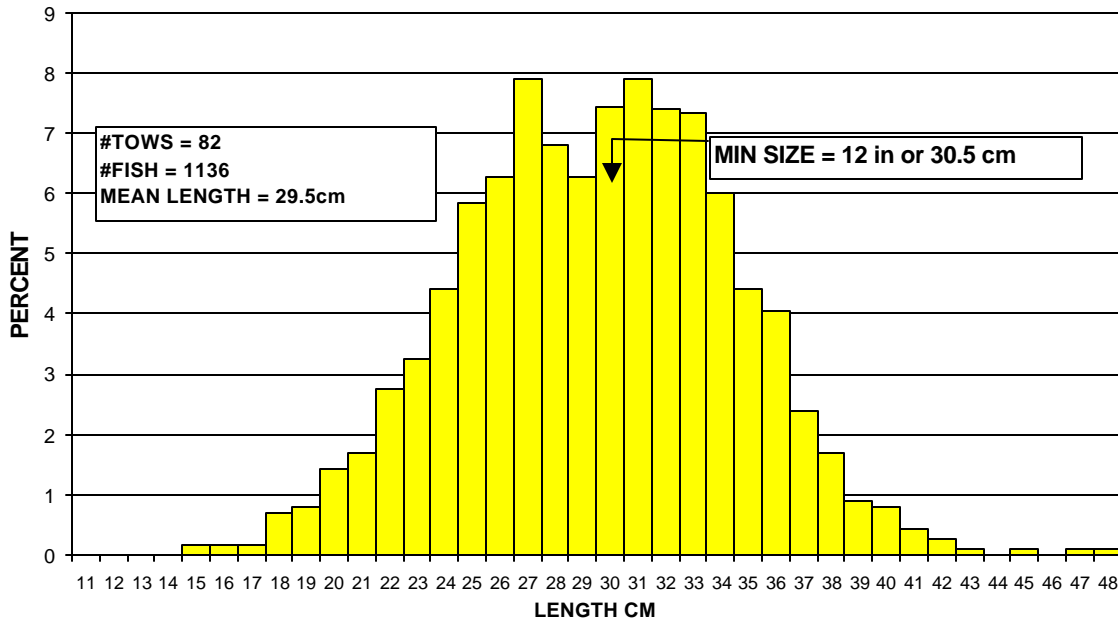


**Figure 13 Cumulative (Expanded) American Plaice Catch from 1999 Sea Sampling Data in Areas 2B and 4**

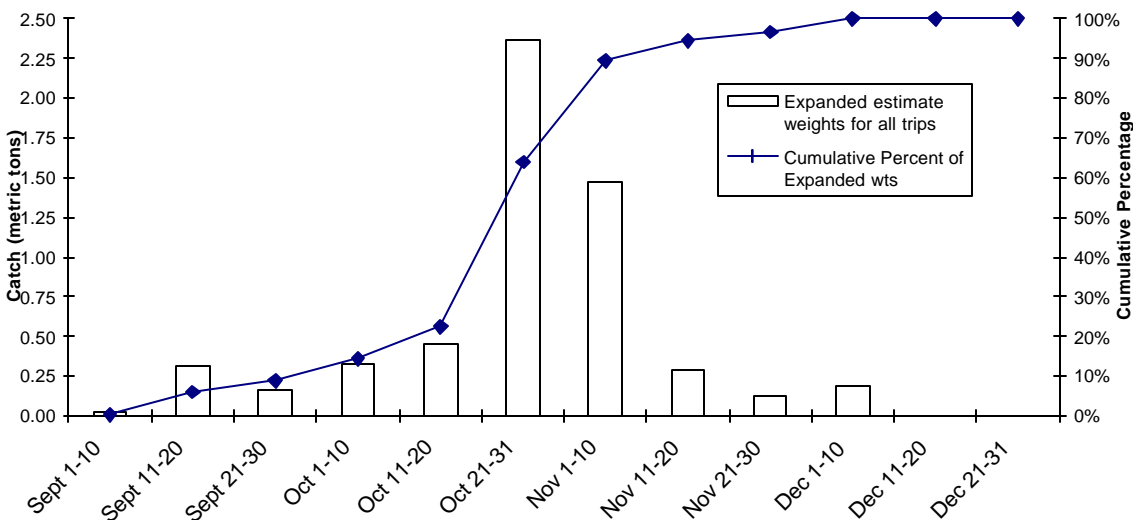


Discards of Gulf of Maine winter flounder in the 1999 experimental raised footrope trawl fishery were around 2% of the total January-November 1999 landings. The length frequency of winter flounder discards ranged from 15 cm to 48 cm with a mean length of 29.5 cm (Figure 14). Nearly one half the discards were above minimum size of 30.5 cm. Discards were generally low except for the Oct 21 – November 10 sampling period, which accounted for 67% of the total discards (Figure 15, Table 5).

**Figure 14 Length Frequencies of Winter Flounder Discards in 1999 Experimental Raised Footrope Trawl Fishery (Areas 2B and 4)**



**Figure 15 Cumulative (Expanded) Winter Flounder Catch from 1999 Sea Sampling Data in Areas 2B and 4**



**Table 5 Cumulative Percentage of Expanded Estimated Catches of Target Species and Regulated Multispecies for Areas 2B and 4**

<b>Time Period</b>	<b>Sept 1-10</b>	<b>Sept 11-20</b>	<b>Sept 21-30</b>	<b>Oct 1-10</b>	<b>Oct 11-20</b>	<b>Oct 21-31</b>	<b>Nov 1-10</b>	<b>Nov 11-20</b>	<b>Nov 21-30</b>	<b>Dec 1-10</b>	<b>Dec 11-20</b>	<b>Dec 21-31</b>	<b>Season Totals</b>
<b>Silver Hake</b>													
Expanded estimate weights for all trips	1.71	30.94	83.09	79.82	105.03	162.57	124.32	90.71	117.31	42.46	0.00	0.00	<b>837.97</b>
Cumulative expanded estimated weights for all trips	1.71	32.65	115.74	195.56	300.59	463.16	587.48	678.19	795.51	837.97	837.97	837.97	
Cumulative Percent of Expanded wt	0.2%	3.9%	13.8%	23.3%	35.9%	55.3%	70.1%	80.9%	94.9%	100.0%	100.0%	100.0%	
<b>Spiny Dogfish</b>													
Expanded estimate weights for all trips	0.07	11.14	1.24	11.75	4.77	55.16	33.96	110.36	8.42	3.04	0.00	0.00	<b>239.91</b>
Cumulative expanded estimated weights for all trips	0.07	11.20	12.44	24.20	28.96	84.12	118.09	228.44	236.86	239.91	239.91	239.91	
Cumulative Percent of Expanded wt	0.0%	4.7%	5.2%	10.1%	12.1%	35.1%	49.2%	95.2%	98.7%	100.0%	100.0%	100.0%	
<b>Red Hake</b>													
Expanded estimate weights for all trips	0.52	4.89	17.05	13.48	32.90	31.16	7.34	1.94	0.26	0.01	0.00	0.00	<b>109.54</b>
Cumulative expanded estimated weights for all trips	0.52	5.41	22.46	35.94	68.84	100.00	107.34	109.28	109.54	109.54	109.54	109.54	
Cumulative Percent of Expanded wt	0.5%	4.9%	20.5%	32.8%	62.8%	91.3%	98.0%	99.8%	100.0%	100.0%	100.0%	100.0%	
<b>Atlantic Cod</b>													
Expanded estimate weights for all trips	0.00	0.07	0.20	0.17	0.28	0.33	1.38	3.56	1.46	4.40	0.00	0.00	<b>11.84</b>
Cumulative expanded estimated weights for all trips	0.00	0.07	0.27	0.44	0.72	1.05	2.42	5.98	7.44	11.84	11.84	11.84	
Cumulative Percent of Expanded wt	0.0%	0.6%	2.2%	3.7%	6.1%	8.8%	20.5%	50.5%	62.9%	100.0%	100.0%	100.0%	
<b>American Plaice</b>													
Expanded estimate weights for all trips	0.06	1.83	1.56	0.41	1.24	1.37	0.36	0.02	0.01	0.05	0.00	0.00	<b>6.92</b>
Cumulative expanded estimated weights for all trips	0.06	1.89	3.45	3.87	5.11	6.48	6.84	6.86	6.87	6.92	6.92	6.92	
Cumulative Percent of Expanded wt	0.9%	27.3%	49.9%	55.9%	73.8%	93.6%	98.7%	99.0%	99.2%	100.0%	100.0%	100.0%	
<b>Winter Flounder</b>													
Expanded estimate weights for all trips	0.02	0.32	0.17	0.32	0.45	2.37	1.47	0.29	0.13	0.19	0.00	0.00	<b>5.73</b>
Cumulative expanded estimated weights for all trips	0.02	0.34	0.51	0.83	1.29	3.66	5.12	5.41	5.54	5.73	5.73	5.73	
Cumulative Percent of Expanded wt	0.4%	5.9%	8.9%	14.5%	22.5%	63.9%	89.5%	94.5%	96.7%	100.0%	100.0%	100.0%	
<b>Pollock</b>													
Expanded estimate weights for all trips	0.01	0.05	0.28	0.63	1.86	0.17	0.02	0.11	0.00	0.02	0.00	0.00	<b>3.15</b>
Cumulative expanded estimated weights for all trips	0.01	0.05	0.33	0.96	2.82	2.99	3.01	3.12	3.12	3.15	3.15	3.15	
Cumulative Percent of Expanded wt	0.2%	1.7%	10.6%	30.5%	89.7%	95.0%	95.8%	99.2%	99.2%	100.0%	100.0%	100.0%	

\* All units are expressed in metric tons.

\*\* Expanded estimated weights come from sea-sampling trips.

**Table 5 cont. Cumulative Percentage of Expanded Estimated Catches of Target Species and Regulated Multispecies for Areas 2B and 4**

<b>Time Period</b>	<b>Sept 1-10</b>	<b>Sept 11-20</b>	<b>Sept 21-30</b>	<b>Oct 1-10</b>	<b>Oct 11-20</b>	<b>Oct 21-31</b>	<b>Nov 1-10</b>	<b>Nov 11-20</b>	<b>Nov 21-30</b>	<b>Dec 1-10</b>	<b>Dec 11-20</b>	<b>Dec 21-31</b>	<b>Season Totals</b>
<b>Haddock</b>													
Expanded estimate weights for all trips	0.02	0.21	0.00	0.14	0.02	0.03	0.06	0.01	0.01	0.00	0.00	0.00	<b>0.49</b>
Cumulative expanded estimated weights for all trips	0.02	0.23	0.23	0.37	0.39	0.41	0.47	0.48	0.49	0.49	0.49	0.49	
Cumulative Percent of Expanded wt	3.8%	45.8%	46.7%	74.8%	78.1%	83.2%	95.9%	98.0%	99.5%	100.0%	100.0%	100.0%	
<b>Yellowtail Flounder</b>													
Expanded estimate weights for all trips	0.00	0.01	0.08	0.08	0.10	0.08	0.08	0.04	0.01	0.06	0.00	0.00	<b>0.53</b>
Cumulative expanded estimated weights for all trips	0.00	0.01	0.10	0.17	0.27	0.35	0.43	0.46	0.47	0.53	0.53	0.53	
Cumulative Percent of Expanded wt	0.1%	2.4%	18.1%	32.8%	50.7%	66.0%	80.7%	87.4%	88.7%	100.0%	100.0%	100.0%	
<b>White Hake</b>													
Expanded estimate weights for all trips	0.00	0.00	0.00	0.00	0.04	0.14	0.05	0.00	0.00	0.01	0.00	0.00	<b>0.26</b>
Cumulative expanded estimated weights for all trips	0.00	0.00	0.00	0.01	0.05	0.19	0.24	0.24	0.24	0.26	0.26	0.26	
Cumulative Percent of Expanded wt	1.2%	1.2%	1.2%	2.6%	18.7%	75.0%	94.7%	94.7%	94.7%	100.0%	100.0%	100.0%	
<b>Redfish</b>													
Expanded estimate weights for all trips	0.00	0.04	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.03	0.00	0.00	<b>0.11</b>
Cumulative expanded estimated weights for all trips	0.00	0.04	0.05	0.05	0.05	0.06	0.06	0.06	0.08	0.11	0.11	0.11	
Cumulative Percent of Expanded wt	0.0%	38.9%	42.8%	46.1%	49.8%	55.5%	55.5%	55.5%	75.3%	100.0%	100.0%	100.0%	
<b>Windowpane Flounder</b>													
Expanded estimate weights for all trips	0.00	0.00	0.00	0.00	0.00	0.04	0.02	0.01	0.00	0.00	0.00	0.00	<b>0.07</b>
Cumulative expanded estimated weights for all trips	0.00	0.00	0.00	0.00	0.00	0.04	0.06	0.07	0.07	0.07	0.07	0.07	
Cumulative Percent of Expanded wt	0.0%	0.0%	0.0%	0.0%	0.0%	59.1%	92.6%	100.0%	100.0%	100.0%	100.0%	100.0%	
<b>Witch Flounder</b>													
Expanded estimate weights for all trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
Cumulative expanded estimated weights for all trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Cumulative Percent of Expanded wt	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
<b>All Groundfish Species Lumped Together</b>													
Expanded estimate weights for all trips	0.11	2.53	2.30	1.76	4.00	4.53	3.44	4.03	1.64	4.77	0.00	0.00	<b>29.10</b>
Cumulative expanded estimated weights for all trips	0.11	2.64	4.94	6.70	10.70	15.23	18.67	22.70	24.33	29.10	29.10	29.10	
Cumulative Percent of Expanded wt	0.4%	9.1%	17.0%	23.0%	36.8%	52.3%	64.2%	78.0%	83.6%	100.0%	100.0%	100.0%	

\* All units are expressed in metric tons.

\*\* Expanded estimated weights come from sea-sampling trips.

### **5.1.3.1.3 Potential Impact of Exempting the Raised Footrope Trawl Fishery on Regulated Multispecies**

The Groundfish Plan Development Team (PDT) addressed the raised footrope trawl fishery in a PDT report dated August 31, 1999. The PDT discussion was based on information from the 1997 and 1998 experimental fisheries. The Groundfish PDT raised three issues that needed to be considered when establishing an exempted raised footrope trawl fishery: (1) increases in cod abundance could lead to increases in total cod bycatch; (2) the amount of potential effort and the potential absolute level (not just the proportion) of regulated species bycatch should be considered; and (3) information was insufficient in Area 4 to draw conclusions. This analysis is designed to address issues 1 and 2. The proposed area for this fishery has been reduced to an area with sufficient sampling to infer discard rates. In addition, recent data from the 1999 experimental fishery was used to estimate impacts on large mesh regulated multispecies.

Analysis of the temporal pattern of Gulf of Maine cod discards shows that nearly 50% of the cod discards occurred after November 20 in 1999. Since rebuilding of Gulf of Maine cod is a high priority for the Council, DMF and the industry have recommended limiting the fishery to September 1 – November 20. This measure alone is expected to reduce the relative discard of cod by 50%.

Discarding of large mesh regulated species will depend on the catch rate and the amount of effort that enters the raised footrope trawl fishery. For this analysis, the catch rate of regulated species is assumed to be proportional to increases in mean biomass. Discard rates (mt per trip) in 1999 for American plaice, witch flounder, Cape Cod yellowtail flounder, white hake, and Gulf of Maine cod were expanded by the ratio of the projected 2000 mean biomass (MSMC, 1999) to 1999 mean biomass (Table 6). Projected mean biomass was not available for Gulf of Maine winter flounder, windowpane flounder, redfish, Gulf of Maine haddock, or pollock. The discard rate observed in the 1999 experimental fishery was assumed to remain the same for these species in 2000. Total potential discards were estimated using static effort in the fishery (1999) and + and - 25% effort in the fishery; all results appear in Table 6.

This analysis projects 25 mt of large mesh regulated species discards under static effort. Total projected discards range from 19 to 31 mt under the  $\pm 25\%$  effort scenario. Under the “static” effort scenario, only American Plaice (7.6 mt), Gulf of Maine winter flounder (5.4 mt), pollock (3.1 mt) and Gulf of Maine cod (6.7 mt) discards are projected to exceed 1 mt. The discards for individual regulated species were compared to the 2000 Target TACs for American Plaice, witch flounder, Cape Cod yellowtail, white hake, and Gulf of Maine cod. According to Table 6, projected discards were below 1% of the Target TAC for all of these species under the “static” effort scenario.

**Table 6 Projected Total Catch (mt) of Regulated Species in the Raised Footrope Trawl Fishery in Area 2B and 4 in 2000 Compared to Target Total Allowable Catch (TTAC) in FY 2000 (MSMC 1999). Projected catch assumes catch rates are proportional to projected mean biomass changes in 2000. Fishery occurs September 1 through November 20.**

Species	American plaice	GOM Winter flounder	Witch flounder	Windowpane	Cape Cod YT	Redfish	White hake	GOM Haddock	Pollock	GOM cod
Ratio of 2000 Mean biomass to 1999 mean biomass	1.1	N/A	1.2	N/A	1.1	N/A	1.2	N/A	N/A	1.1
Catch assuming -25% effort	5.69 (0.45%)	4.06	0.07 (<0.01%)	0.05	0.64 (0.07%)	0.05	0.22 (0.31%)	0.48	2.34	5.01 (0.66%)
Catch assuming static effort	7.58 (0.60%)	5.41	0.10 (0.01%)	0.07	0.86 (0.10%)	0.06	0.29 (0.41%)	0.48	3.12	6.68 (0.88%)
Catch assuming +25% effort	9.48 (0.75%)	6.76	0.12 (0.01%)	0.09	1.07 (0.12%)	0.08	0.37 (0.51%)	0.60	3.90	8.35 (1.10%)
2000 TTAC <sup>1</sup>	1,256.00	Not estimated	1725.00	Not estimated	896.00	Not estimated	72.00	Not Estimated	Not estimated	761.00

<sup>1</sup> 2000 Target TAC reflects Amendment 9 objectives ( $F_{MSMC}$ ) listed in 1999 MSMC report. The 2000 Target TAC based on Amendment 7 objectives for Gulf of Maine cod is 1118 mt.

#### **5.1.3.1.4 Impact of Options to Adjust Framework 33 “Rolling Closure” Provisions**

The Council considered two alternatives for exempting the whiting raised footrope trawl fishery from the October/November closed areas established in Framework 33: (1) allowing the raised footrope trawl fishery to occur within the Gulf of Maine closed areas and (2) closing only the northern half of Blocks 124 and 125 during the times when the closure of these blocks overlaps with the raised footrope trawl fishery. These two options were considered by the Council during the development of Framework 33, but action was delayed until this framework adjustment could be developed to address the raised footrope trawl fishery in its entirety. *Option 1* represents the proposed action.

This section presents an analysis of the two options that the Council considered during the development of this framework adjustment; it includes discussion of bycatch, enforcement, and administration among other issues. The following information characterizes the amount and type of groundfish bycatch that has been observed in the raised footrope trawl fishery between 1996 and 1999. These data confirm that the raised footrope trawl has operated effectively in Areas 2B and 4 with less than 5% overall groundfish bycatch. Additional information provided in this section supports the notion that Atlantic cod is more concentrated in the northern half of Block 124 (where the raised footrope trawl fishery does not occur) and that protection of the northern half of the block is more critical for the recovery of the Gulf of Maine cod stock than protection of the southern half of the block.

#### **Supporting Groundfish Bycatch Information from Experimental Fisheries**

DMF has conducted sea sampling trips in the raised footrope trawl fishery for more than four years to obtain data to meet standards for an exempted fishery. In 1996, DMF conducted 20 sea sampling trips in Area 2B. For those 20 trips, cod bycatch was reported to comprise 0.04% of the total catch. In addition, total regulated species bycatch was well below 5% for those 20 observed trips.

Table 7 summarizes catch and bycatch information for about 24 sea sampling trips during the 1997 experimental fishery. For both areas, regulated species catch averaged less than 5% of the total catch. Most groundfish that were caught were flatfish species (winter flounder, American plaice), but overall, the fishery operated in these areas with very little bycatch during 1997.

**Table 7 Data from 24 Sea Sampling Trips in 1997 Raised Footrope Trawl Fishery**

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

Table 8 reports catch and bycatch information for about 43 tows observed on sea sampling trips during the 1998 experimental fishery in Areas 2B and 4. For both areas, total regulated species catch averaged well below 5% of the total catch. While cod comprised the largest percentage of regulated species bycatch, overall, the raised footrope trawl operated successfully in these areas with minimal interaction with regulated multispecies.

**Table 8 Data from 43 Sea Sampling Tows in 1998 Raised Footrope Trawl Fishery**

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

### **Cod Distribution in Block 124**

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

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

Three gear types accounted for all cod catch examined in the sea sampling database: gillnet, otter trawl, and scallop dredge. A total of 24,802 pounds of cod were caught on these observed trips, primarily by gillnet vessels. Of the total observed cod catch, about 3% came from the southern half of Block 124.

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

### **Comparative Analysis of Options to Adjust the October/November Closure Provisions**

The following two options for the raised footrope trawl fishery were compared and evaluated based on potential biological impacts, potential economic impacts, administration, enforcement, bycatch, and data acquisition:

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

Table 9 compares the two alternatives that the Council considered and characterizes the differences in their potential impacts. A “+” denotes that the option is likely to produce a *more positive* benefit than the other option for the category under consideration. A “-” denotes that the option is likely to produce a *more negative* benefit than the other option for the category under consideration. Additional comments are provided to help characterize the differences between the likely impacts of the two alternatives.

**Table 9 Comparative Analysis of Options to Adjust the October/November Closure Provisions**

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

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

The Council rejected Option 2 based on recommendation of the Groundfish PDT and based on subsequent analyses suggesting that this option would have a greater impact on some large mesh regulated species than Option 1. Analyses supporting these conclusions are provided below.

The impact of vessels participating in the raised footrope trawl fishery on large mesh regulated species would be the same for Options 1 and 2. However, Option 2 would have allowed multispecies vessels to fish in the southern area of Blocks 124 and 125 during the Oct./Nov. “rolling closure,” which may allow for increased catches of large mesh regulated species as compared to 1999. A NEFSC analysis suggests that impacts on Gulf of Maine cod would be negligible in the southern portion of Blocks 124 and 125 during October and November (Appendix III). However, other large mesh regulated species were not analyzed. An examination of monthly landings by 30-minute squares for 1989-1993 (Multispecies SAFE Report, 1999) suggests that Blocks 124 and 125 are important sources of landings for Gulf of Maine winter flounder (top 25<sup>th</sup>-50<sup>th</sup> percentile in November) and monkfish (top 1st-25<sup>th</sup> percentile in November). Furthermore, winter flounder landings were within the top 25<sup>th</sup> percentile in Block 115 (abuts the southern edge of block 124), suggesting that winter flounder landings from the southern area of Block 124 may be substantial in November. Other species that ranked in the top 75<sup>th</sup> (50-75<sup>th</sup> percentile) during the months of October and November include Cape Cod yellowtail flounder, witch flounder, American plaice, and pollock.

Catches of large mesh regulated species by large mesh vessels would clearly increase by modifying the boundary of the closure and would likely be less conservative than the 1999 “status quo.” Estimating potential catches of regulated species in Option 2 is difficult because the landings data are not readily available in intervals less than 30 minute square – month blocks. In addition, predicting the amount of large mesh fishing effort drawn to the partial opening would be difficult because the five-month closure of Blocks 124 and 125 (February, March, April, October, November) may have altered pre-Framework 27 temporal patterns of large-mesh effort usage. The Groundfish PDT examined both options originally for Framework 31 and concluded that modifying the boundary of the October-November closed area “would pose an unacceptable risk to cod and other overfished species.” The conclusion relative to cod was based on examining cod landings from Blocks 124 and 125 and was made prior to estimating cod landings from the southern half of Blocks 124 and 125.

The Council rejected Option 2 based on potentially increased catches of large mesh regulated species and the difficulty in predicting the amount of regulated groundfish bycatch that could occur under Option 2. In contrast, analysis of Option 1 (the proposed action) is based only on effort and discard rates in the raised footrope trawl fishery, a fishery that will be more geographically confined than in Option 2. Option 1 requires less sea sampling than Option 2 to monitor the impact on groundfish bycatch as only the raised footrope trawl fishery needs to be sampled.

#### **5.1.3.1.5 Summary and Conclusions**

Establishing a seasonal whiting raised footrope trawl fishery in upper Cape Cod Bay will not significantly impact mortality or rebuilding schedules for any large mesh regulated groundfish stocks. The raised footrope trawl fishery has been ongoing as an experimental fishery since 1995 and has occurred during the 1999 October/ November rolling closure of blocks 124 and 125.

The low absolute catches of large mesh regulated species projected for 2000 and the fact that the exempted fishery is more restricted in area and season than the experimental fishery in 1999 suggests that the raised footrope trawl fishery is unlikely to exert any additional mortality on large mesh regulated species. Large increases in effort are not expected because a substantial proportion of the fishery occurs within state waters (Figure 6), requiring a Massachusetts' Coastal Access Permit (limited access, with moratorium on new permits) and maximum vessel size of 72'. At minimum, Option 1 for adjusting the October/November closure, the proposed action, is "conservation neutral" relative to 1999 and actually may slightly reduce catches of large mesh regulated species.

Table 10 summarizes the total potential catch of regulated multispecies in the raised footrope trawl fishery if effort in the fishery (a) decreases by 25%, (b) remains static (at 1999 levels), or (c) increases by 25%. Table 10 compares expected catch of regulated species in the raised footrope trawl fishery (as calculated by expanded sea sampled estimates) to either 2000 Target TAC levels for multispecies stocks (if one has been specified) or 1999 landings (preliminary, January – November only) and presents the estimate of catch in the raised footrope trawl fishery as a percentage of either the Target TAC or the 1999 landings. This table serves to characterize (in a relative sense) the total magnitude and proportion of regulated multispecies catch that may be attributed to the raised footrope trawl fishery in the future (although all regulated species catch in the raised footrope trawl fishery will be discarded). It illustrates that even under the 25% increased effort scenario, only 0.31% of the total potential multispecies catch (or landings) could be expected to come from the raised footrope trawl fishery.

The Council already formally voiced its support for the continuation of the raised footrope trawl fishery on several occasions (discussion at Committee and Council meetings, letters to NMFS, see Appendix I). The data presented in this framework document indicate that the raised footrope trawl significantly reduces the bycatch of most regulated groundfish species while not compromising the catch of target small mesh species, an accomplishment for which the Council commends the fishing industry and the Massachusetts DMF. The Council believes that the development of the raised footrope trawl demonstrates the creativity and innovation that will keep the small mesh fishing fleet in the Gulf of Maine viable now and in the future. In turn, the Council wants to provide these vessels with an opportunity to catch whiting in the Gulf of Maine during the fall and winter. The Provincetown dayboats in particular are critically dependent on nearshore access to whiting fishing grounds.

**Table 10 Expected Catch of Regulated Species Under Static Effort (1999 Levels), 25% Increase in Effort, and 25% Decrease in Effort Compared to Either the 2000 Target TAC or January – November 1999 Landings**

*Catches and landings are in metric tons.*

SPECIES	American Plaice	GOM Winter Flounder**	Witch Flounder	Windowpane Flounder**	Cape Cod YT	Redfish**	White Hake	GOM Haddock**	Pollock**	GOM Cod	TOTAL (mt)
Projected Catch (mt) Assuming <b>-25% Effort</b>	5.69 (0.45%)	4.06 (1.56%)	0.07 (<0.01%)	0.05 (0.12%)	0.64 (0.07%)	0.05 (0.01%)	0.22 (0.31%)	0.48 (0.09%)	2.34 (0.06%)	5.01 (0.66%)	<b>18.61</b> <b>(0.19%)</b>
Projected Catch (mt) Assuming <b>Static Effort (1999)</b>	7.58 (0.60%)	5.41 (2.08%)	0.10 (0.01%)	0.07 (0.16%)	0.86 (0.10%)	0.06 (0.02%)	0.29 (0.41%)	0.48 (0.09%)	3.12 (0.08%)	6.68 (0.88%)	<b>24.65</b> <b>(0.25%)</b>
Projected Catch (mt) Assuming <b>+25% Effort</b>	9.48 (0.75%)	6.76 (2.6%)	0.12 (0.01%)	0.09 (0.21%)	1.07 (0.12%)	0.08 (0.02%)	0.37 (0.51%)	0.60 (0.11%)	3.90 (0.09%)	8.35 (1.10%)	<b>30.82</b> <b>(0.31%)</b>
2000 Target TAC (mt)* <b>OR</b> Jan-Nov 1999 Landings**	1,256.00	260.00	1725.00	43.00	896.00	322.00	72.00	529.00	4152.00	761.00***	<b>10,016</b>

\* Target TACs were estimated by the MSMC (1999) by applying the target fishing mortality rate to current biomass estimates for those species.

\*\* Shaded columns are those species for which a Target TAC for 2000 was not estimated. Instead of comparing the raised footrope trawl catch to the Target TAC for these species, comparisons are made to Jan. – Nov. 1999 landings. January – April 1999 landings were taken from the MSMC 1999 Report; May – November landings were taken from preliminary data provided by NMFS as of 3/23/00.

\*\*\* 2000 Target TAC for Gulf of Maine Cod reflects Amendment 9 objectives ( $F_{MSMC}$ ) listed in 1999 MSMC Report. The 2000 Target TAC based on Amendment 7 objectives for Gulf of Maine cod is 1,118 mt.