


MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke 
Executive Director

DATE: January 24, 1996

SUBJECT: BSAI Pacific Cod Allocation

ESTIMATED TIME 3 Hours

ACTION REQUIRED

- (a) Review problem statement.
- (b) Review analytical outline and scope of work.

BACKGROUND

Problem Statement

The original BSAI Pacific cod gear allocation (Amendment 24) was developed in 1993 to address the following problem statement, which emphasized the need for a bridge to comprehensive rationalization:

The Bering Sea/Aleutian Islands Pacific cod fishery, through overcapitalized open access management exhibits numerous problems which include: compressed fishing seasons, periods of high bycatch, waste of resource, gear conflicts and an overall reduction in benefit from the fishery. The objective of this amendment is to provide a bridge to comprehensive rationalization. It should provide a measure of stability to the fishery while allowing various components of the industry to optimize their utilization of the resource.

At the December 1995 meeting, members of the Council felt that significant changes have taken place in the Pacific cod fishery since Amendment 24 went into effect on January 1, 1994. These changes were viewed as biological, economic, and regulatory in nature. Staff was asked to incorporate these changes in the analysis, with specific focus on PSC mortality, impacts on habitat, and discards of Pacific cod by various industry sectors.

Staff is seeking guidance from the Council in developing a problem statement. The Council may wish to use the original problem statement that was provided above, develop a new statement based on the concerns expressed at the December meeting, or a combination of the two.

Analytical Outline and Scope of Work

At the December 1995 meeting the Council provided staff with the alternatives to be analyzed. Analysis of the basic gear split alternatives will be completed by the April 1996 meeting. Final action is scheduled for the June 1996 meeting in Portland. Given this time line, a program would be in place, if approved, when Amendment 24 expires at the end of 1996.

The Council's action in December also included an analysis of a further split of the trawl gear allocation between catcher and catcher processor vessels. The range of that allocation was defined as 60/40 to 40/60. During the Council discussions in December, it was recognized that this portion of the Pacific cod allocation issue would be done concurrently with the basic gear split, but on a different time line, with that analysis coming back to the Council for initial review in June. Because of the integrated nature of these issues, there is probably good reason to try and combine them and have initial review of the entire package in April, with final action in June. With the commitment of Center economists to assist in the overall analysis, we feel that we can accomplish this by April. The tradeoff which needs to be considered by the Council is that further analytical work on the IBQ/VBA program will have to be delayed until after the April meeting. This probably would not disrupt the date for eventual implementation of VBAs, currently scheduled to begin in 1998, at the earliest. (Implementation of a VBA program in 1998 may be optimistic, even if they were approved in June 1996.)

Imbedded in the proposal to split the trawl allocation among catcher vessels and catcher processors was language which would re-apportion the split based on the discards in the previous year. After discussing this issue at length, it was felt that, since its effects would not be felt until 1998 at the earliest, this issue could best be studied at a later date, perhaps as part of the Improved Retention and Utilization issue. Therefore, this portion of the proposal will not be included in the current analysis.

The alternatives selected by the Council would allocate specific percentages of the BSAI Pacific cod fisheries between trawl, fixed, and jig gear fishermen. Seven alternatives were identified by the Council, representing a wide range of options with potential impacts to vessel owners, processors, and coastal communities. Alternative 1 is the "no-action" alternative, which would eliminate explicit allocations of Pacific Cod. Each of the remaining six alternatives contain three sub-options pertaining exclusively to the trawl sector. Specifically these would:

- a. not explicitly allocate between catcher vessels and catcher processors;
- b. designate 40% of the trawl allocation for use by catcher vessels and the remainder for catcher processors;
- c. designate 60% of the trawl allocation for use by catcher vessels. The range between 40% and 60% would also be available for Council consideration.

In all there are 19 possible allocation options under consideration. These are shown in the table below. Alternative 2a represents the current allocation, and Alternative 3a the reciprocal of the current allocation. Alternatives 4-7 are ordered from high to low allocations for the trawl fleet.

Table 1. Alternative Allocations of Pacific Cod in the BSAI

Alternative	Trawl		Fixed	Jig
	Catcher Vessels	Catcher Processors		
1	No Action - Current allocation will expire at the end of 1996.			
2a (Current)	54%		44%	2%
2b (40/cp=60)	21.6%	32.4%	44%	2%
2c (60/40)	32.4%	21.6%	44%	2%
3a (Reciprocal)	44%		54%	2%
3b (40/60)	17.6%	26.4%	54%	2%
3c (60/40)	26.4%	17.6%	54%	2%

Table 1 (continued)

Alternative	Trawl		Fixed	Jig
	Catcher Vessels	Catcher Processors		
4a	69%		29%	2%
4b (40/60)	27.6%	41.4%	29%	2%
4c (60/40)	41.4%	27.6%	29%	2%
5a	59%		39%	2%
5b (40/60)	23.6%	35.4%	39%	2%
5c (60/40)	35.4%	23.6%	39%	2%
6a	39%		59%	2%
6b (40/60)	15.6%	23.4%	59%	2%
6c (60/40)	23.4%	15.6%	59%	2%
7a	29%		69%	2%
7b (40/60)	11.6%	17.4%	69%	2%
7c (60/40)	17.4%	11.6%	69%	2%

Staff has developed a summary of the organization of the analysis as currently envisioned. Also included are the primary assumptions which will be used, and the information that will be compiled. The paper is presented under Item C-1(a). Following this is a preliminary compilation and discussion of tables showing catches by gear group for 1994 and 1995. These may provide additional background information for the Council in their problem statement discussions, or if additions or deletions to the list of alternative are contemplated.

Again, to be sure everyone understands, for the staff to have the analysis of the gear split and the CP-CV split available by April, the IBQ/VBA analysis must slide to this summer. An initial IBQ/VBA package most likely could be made available for September and a final decision scheduled for January 1997. Given Secretarial approval, VBAs could possibly be implemented in 1998, at the earliest, or perhaps more likely, 1999.

Preliminary Estimates of Pacific Cod Catches By Gear Group in 1994 and 1995

The tables on the following pages represent a first cut at some of the catch totals from the blend data for 1994 and preliminary blend data for 1995. These tables are indicative of the tables we intend to present in the document. At this point, they may be useful background information if the Council wishes to delete or add to the alternatives currently planned for study. Tables 1, 2, and 3 all follow the same general format. They report retained, discarded, and total catch of Pacific by a gear group for 1994 and 1995. For each gear group reported there are four rows showing:

- a) Metric tons of Pacific cod retained or discarded for the year by that gear (**Metric Tons**)
- b) The amount retained or discarded for the year by that gear as a percent of the total catch by that gear for the year, i.e. the row percent. (**% Ret./Dis.**)
- c) The amount of retained, discarded or total catch by that gear for the year as a percent of the sum of all gears retained, discarded or total catch for the year, i.e. the column percent. (**% by Gear**)
- d) The amount retained, discarded, or total catch by that gear as a percent of the total catch of all gears included in the table for the year, i.e., the total percent. (**% of Total**)

Table 1 shows the retained, discarded and total catch of Pacific cod by trawl, fixed, and jig gear as reported in the blend data for 1994 and preliminary blend data for 1995. Table 2 shows the breakdown of fixed gear Pacific cod catches between hook and line and pot gear. Table 3 provides additional detail for the trawl sector, and includes retained, discarded and total catches of Pacific cod in four groupings of target fisheries: Flatfish, Other, Pollock and Pacific cod. Each target fishery group shows the catch by trawl catcher vessels and trawl catcher processors. These three tables provide a fairly complete summary of the catch of Pacific cod over the first two years of the Pacific cod allocation, and will be the basis of much of the work done in the forthcoming analysis.

At this point it may be helpful to walk through some of the numbers included in Table 1 in order to clarify its structure and content. The basic table consists of a set of four rows for each of the three gear groups, and a set of rows showing the total of all gears. Within each of set of four rows there are two sets of columns, the first showing 1994 data, and the second showing 1995. Within each set of columns there are numbers showing retained catch, discarded catch and total catch for the year. Thus, looking at the first row of data, we see that the in 1994 fixed gears retained 92,041 metric tons of Pacific cod and discarded 3,335 mt, for a total of 95,375 mt. In 1995, retained catches by fixed gears increased to 116,382 mt, with 7,353 mt of discards for a total of 123,735 mt. Jig gear, shown in the next section of rows, had 730 tons of reported catch in 1994 with no discards. In 1995 that number dropped to 571 mt, again with no reported discards of Pacific cod. Trawl catches, like fixed gear catches, increased from 1994 to 1995, from a total of 100,467 mt. to 120,065 mt.

The second row in each of the sets of rows shows the proportion of retained and discarded catch to the total catch for the year by the gear group. Fixed gear reported discards of 3.5% of their total Pacific cod catch in 1994, compared to 5.94% in 1995. Trawl vessels on the other hand reported discards equaling 30.08% of their 1994 total catch of Pacific cod. In 1995 that proportion increased slightly to 31.30%. As mentioned above the jig gear vessels reported no discards.

The last two rows in each set of rows for the gear groups relate catches of one gear group to the sum of catches by all gear groups. The first column in the third row relates 1994 retained catch by the fixed gear group to the sum of 1994 retained catches by all gears. Thus the 92,041 mt retained by fixed gears in 1994 was 56.46% of the total amount of Pacific cod retained by all gears. The proportion of retained trawl catch (70,243 mt) to retained catch by all gears was 43.09%. From the fourth row in the trawl group we also see that the retained trawl catch of 70,243 mt is 35.73% of the total catch including discards of all gears in 1994.

There are some very obvious conclusions from Table 1, particularly given that the allocation formula prescribed a 54/44/2 split between trawl, fixed, and jig gears in both 1994 and 1995. In 1994 the actual split was

51.1/48.5/0.4, and 50.6/49.1/0.2 in 1995. In both 1994 and 1995 the directed fisheries for Pacific cod with trawl gear were closed because of halibut bycatch before the total trawl apportionment was taken. In both years, portions of the trawl apportionment were reallocated to fixed gear. In 1995, part of the jig apportionment was also shifted to the other gear groups. In both 1994 and 1995, the fixed gear fishery was closed due to halibut bycatch, but this occurred after the remaining trawl apportionment was switched.

Table 1 1994 and 1995 Retained, Discarded and Total Catch by Gear Allocation Group.

Gear	Information Reported	1994			1995		
		Retained	Discard	Total	Retained	Discard	Total
Fixed	Metric Tons	92,041	3,335	95,375	116,382	7,353	123,735
	% Ret. / Dis.	96.50%	3.50%	100.00%	94.06%	5.94%	100.00%
	% by Gear	56.46%	9.94%	48.52%	58.35%	16.36%	50.63%
	% of Total	46.82%	1.70%	48.52%	47.63%	3.01%	50.63%
Jig	Metric Tons	730	0	730	571	0	571
	% Ret. / Dis.	100.00%	0.00%	100.00%	100.00%	0.00%	100.00%
	% by Gear	0.45%	0.00%	0.37%	0.29%	0.00%	0.23%
	% of Total	0.37%	0.00%	0.37%	0.23%	0.00%	0.23%
Trawl	Metric Tons	70,243	30,224	100,467	82,486	37,579	120,065
	% Ret. / Dis.	69.92%	30.08%	100.00%	68.70%	31.30%	100.00%
	% by Gear	43.09%	90.06%	51.11%	41.36%	83.64%	49.13%
	% of Total	35.73%	15.38%	51.11%	33.75%	15.38%	49.13%
Total	Metric Tons	163,014	33,559	196,572	199,440	44,931	244,371
	% Ret. / Dis.	82.93%	17.07%	100.00%	81.61%	18.39%	100.00%
	% by Gear	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	% of Total	82.93%	17.07%	100.00%	81.61%	18.39%	100.00%
<p>% Ret. / Dis. is the retained catch (or discarded catch) for the year by that gear as a percent of the total catch by that gear for the year (i.e the row percent).</p> <p>% by Gear is the retained, discarded, or total catch by that gear for the year as a percent of the total retained, discarded, or total catch of all gears in the table for the year (i.e. column percent).</p> <p>% of Total is the retained, discarded, or total catch by that gear for the year as a percent of the total catch of all gears in the table for the year (i.e. total percent).</p>							

Table 2 provides additional detail concerning the fixed gear catches, differentiating between hook and line and pot catches. This table uses the same format as seen in Table 1. From Table 2 it is apparent that pot gear catches of Pacific cod have increased relative to hook and line gear. From 1994 to 1995 the catch by pot gear has more than doubled from 8,236 mt to 19,828 mt, and increase of over 11,000 mt. Over the same period hook and line catches increased over 16,000 mt from 87,139 mt in 1994 to 103,906 mt in 1995. Part of this increase may be attributable to the general increase in Pacific cod abundance (the total TAC increased by roughly 50,000 mt over the same period), but it is also likely that some of the increase is more fundamental, and will need to be accounted for in the analysis. Indeed, some of the impetus for increasing the allocation to fixed gears is the recognition that vessels using pot gear face declining crab stocks, and therefore uncertain futures, unless they diversify into other fisheries.

Table 2 1994 and 1995 Retained, Discarded and Total Catch by Gear Within the Fixed Gear Allocation Group.

Gear	Information Reported	1994			1995		
		Retained	Discarded	Total	Retained	Discarded	Total
Hook and Line	Metric Tons	83,973	3,167	87,139	96,865	7,041	103,906
	% Ret. / Dis.	96.37%	3.63%	100.00%	93.22%	6.78%	100.00%
	% by Gear	91.23%	94.95%	91.36%	83.23%	95.76%	83.98%
	% of Total	88.04%	3.32%	91.36%	78.28%	5.69%	83.98%
Pot	Metric Tons	8,068	168	8,236	19,517	311	19,828
	% Ret. / Dis.	97.96%	2.04%	100.00%	98.43%	1.57%	100.00%
	% by Gear	8.77%	5.05%	8.64%	16.77%	4.24%	16.02%
	% of Total	8.46%	0.18%	8.64%	15.77%	0.25%	16.02%
Total Fixed	Metric Tons	92,041	3,335	95,375	116,382	7,353	123,735
	% Ret. / Dis.	96.50%	3.50%	100.00%	94.06%	5.94%	100.00%
	% by Gear	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	% of Total	96.50%	3.50%	100.00%	94.06%	5.94%	100.00%
<p>% Ret. / Dis. is the retained catch (or discarded catch) for the year by that gear as a percent of the total catch by that gear for the year (i.e the row percent).</p> <p>% by Gear is the retained, discarded, or total catch by that gear for the year as a percent of the total retained, discarded, or total catch of all gears in the table for the year (i.e. column percent).</p> <p>% of Total is the retained, discarded, or total catch by that gear for the year as a percent of the total catch of all gears in the table for the year (i.e. total percent).</p>							

Table 3 sheds additional light on the trawl portion of the Pacific cod harvests in 1994 and 1995. This table is very similar in structure to the previous two tables containing discrete sets of four rows and two sets of three columns for each year. In this table we have added two new dimensions, showing catches of Pacific cod in various target fishery groups by trawl catcher vessels and trawl catcher processors. This is relevant information for the trawl fisheries because a large portion of the Pacific cod harvests actually occur while vessels are targeting other species. Other targets are less significant to fixed gear and jig vessels with respect to their catch of Pacific cod, and therefore we have not included that information at this time.

In 1994 the total trawl harvest of Pacific cod when Pacific cod was the target totaled 53,215 mt. This was 52.97% of the 100,467 mt total trawl catch. Thus 47,255 mt were taken as bycatch in other trawl target fisheries. This represented 24% of the Pacific cod catch by all gears in the year. In 1995, bycatch of Pacific cod in other trawl target fisheries accounted for 49,932 mt, or 20% of the total Pacific cod catch by all gears. In making a decision to open a directed fishery for trawl gear under the various allocation options, the NMFS would compare the amount available for harvest by the trawl group with estimated bycatch needs. It is likely that NMFS would use an estimate close to 20%, given the bycatch numbers above. If the Council chose to allocate only 29% to the trawl sector there would appear to be some chance that the NMFS would not open a directed trawl fishery for Pacific cod. Under allocation options with explicit allocations to catcher vessels and catcher processors, that likelihood increases for the catcher/processor fleet.

In 1995, catcher/processors accounted for 69,288 mt of Pacific cod, 57.71% of the total trawl catch of Pacific cod. However, only 29,366 mt of that was harvested when Pacific cod was the target. This means that nearly 40,000 mt (or roughly 16% of the total catch by all gears) of Pacific cod were taken as bycatch in other groundfish target fisheries by catcher/processors. In 1994, roughly 42,000 mt of Pacific cod was taken as bycatch in non-Pacific cod target fisheries by catcher/processors. That year the bycatch of Pacific cod by catcher/processors was roughly 21% of the total Pacific cod catch by all gears. Given our earlier assumption (#1) that NMFS would not open a Pacific cod target fishery if the allocation to that group was less than its bycatch needs, it is likely that under allocation options 3c, 6c, 7b, and 7c, NMFS would not allow a directed Pacific cod fishery for trawl catcher/processors. Additionally, the 1994 bycatch rates would make directed fisheries for catcher/processors questionable under allocation options 2c, 5c, and 6b as well.

Reported catcher vessel bycatch of Pacific cod in other target fisheries is not as significant an issue as with the catcher processor fleet. A primary reason for this appears to be the lack of participation by catcher vessels in these other fisheries, with the exception of the pollock fishery. In 1994 catcher vessels harvested 37,270 mt of their 42,927 mt total in the Pacific cod target fishery. The remaining 5,657 mt (approximately 3% of the total 1994 catch) was bycatch of Pacific cod in other target fisheries. In 1995 catcher vessel bycatch of Pacific cod in other target fisheries accounted for 4% of the total catch of Pacific cod by all gears in all fisheries. Given these figures it appears less likely that NMFS would disallow a directed fishery for Pacific cod by catcher vessels under any of the sub-options designating separate catcher vessel allocations.

Table 3 is also useful when examining retained and discarded Pacific cod by the trawl fleet. Clearly, Pacific cod discards are higher relative to retained Pacific cod in target fisheries for other groundfish species. In fact, retention in the Pacific cod target fishery approaches 90%, while overall retention of Pacific cod by trawlers represented slightly less than 70% of the total catch. Comparing discards when directed fishing for Pacific cod is open to when Pacific cod is on "bycatch only" status will provide further insights.

Obviously, the findings discussed above are preliminary and only scratch the surface of the information we hope to provide in the analysis. They may however provide useful insights during Council discussions of this issue.

Table 3 1994 and 1995 Retained, Discarded and Total Pacific Cod Trawl Catch By Target and Delivery Mode.

Trawl Target	Delivery Mode	Information Reported	1994			1995		
			Retained	Discard	Total	Retained	Discard	Total
FLAT	CP	Metric Tons	10,593	13,643	24,236	10,397	12,561	22,958
		% Ret. / Dis.	43.71%	56.29%	100.00%	45.29%	54.71%	100.00%
		% target mode	15.08%	45.14%	24.12%	12.60%	33.43%	19.12%
		% of Total	10.54%	13.58%	24.12%	8.66%	10.46%	19.12%
	CV	Metric Tons	602	148	751	2,106	806	2,912
		% Ret. / Dis.	80.25%	19.75%	100.00%	72.32%	27.68%	100.00%
		% target mode	0.86%	0.49%	0.75%	2.55%	2.14%	2.43%
		% of Total	0.60%	0.15%	0.75%	1.75%	0.67%	2.43%
	FLAT Total	Metric Tons	11,195	13,792	24,987	12,503	13,367	25,870
		% Ret. / Dis.	44.80%	55.20%	100.00%	48.33%	51.67%	100.00%
		% target mode	15.94%	45.63%	24.87%	15.16%	35.57%	21.55%
		% of Total	11.14%	13.73%	24.87%	10.41%	11.13%	21.55%
OTHR	CP	Metric Tons	5,464	2,380	7,843	2,953	1,751	4,704
		% Ret. / Dis.	69.66%	30.34%	100.00%	62.78%	37.22%	100.00%
		% target mode	7.78%	7.87%	7.81%	3.58%	4.66%	3.92%
		% of Total	5.44%	2.37%	7.81%	2.46%	1.46%	3.92%
	CV	Metric Tons	0	0	0	0	8	8
		% Ret. / Dis.	0.00%	100.00%	100.00%	0.00%	100.00%	100.00%
		% target mode	0.00%	0.00%	0.00%	0.00%	0.02%	0.01%
		% of Total	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%
	OTHR Total	Metric Tons	5,464	2,380	7,844	2,953	1,759	4,712
		% Ret. / Dis.	69.66%	30.34%	100.00%	62.67%	37.33%	100.00%
		% target mode	7.78%	7.87%	7.81%	3.58%	4.68%	3.92%
		% of Total	5.44%	2.37%	7.81%	2.46%	1.46%	3.92%
PLCK	CP	Metric Tons	2,961	6,554	9,515	2,086	10,173	12,260
		% Ret. / Dis.	31.12%	68.88%	100.00%	17.02%	82.98%	100.00%
		% target mode	4.22%	21.68%	9.47%	2.53%	27.07%	10.21%
		% of Total	2.95%	6.52%	9.47%	1.74%	8.47%	10.21%
	CV	Metric Tons	3,096	1,810	4,907	3,173	3,918	7,091
		% Ret. / Dis.	63.11%	36.89%	100.00%	44.74%	55.26%	100.00%
		% target mode	4.41%	5.99%	4.88%	3.85%	10.43%	5.91%
		% of Total	3.08%	1.80%	4.88%	2.64%	3.26%	5.91%
	PLCK Total	Metric Tons	6,057	8,364	14,421	5,259	14,091	19,350
		% Ret. / Dis.	42.00%	58.00%	100.00%	27.18%	72.82%	100.00%
		% target mode	8.62%	27.67%	14.35%	6.38%	37.50%	16.12%
		% of Total	6.03%	8.33%	14.35%	4.38%	11.74%	16.12%

Table 3 (Continued)

Trawl Target	Delivery Mode	Information Reported	1994			1995		
			Retained	Discard	Total	Retained	Discard	Total
PCOD	CP	Metric Tons	13,386	2,559	15,945	25,503	3,862	29,366
		% Ret. / Dis.	83.95%	16.05%	100.00%	86.85%	13.15%	100.00%
		% target mode	19.06%	8.47%	15.87%	30.92%	10.28%	24.46%
		% of Total	13.32%	2.55%	15.87%	21.24%	3.22%	24.46%
	CV	Metric Tons	34,141	3,129	37,270	36,268	4,499	40,767
		% Ret. / Dis.	91.60%	8.40%	100.00%	88.96%	11.04%	100.00%
		% target mode	48.60%	10.35%	37.10%	43.97%	11.97%	33.95%
		% of Total	33.98%	3.11%	37.10%	30.21%	3.75%	33.95%
	PCOD Total	Metric Tons	47,527	5,688	53,215	61,772	8,361	70,133
		% Ret. / Dis.	89.31%	10.69%	100.00%	88.08%	11.92%	100.00%
		% target mode	67.66%	18.82%	52.97%	74.89%	22.25%	58.41%
		% of Total	47.31%	5.66%	52.97%	51.45%	6.96%	58.41%
Total	CP	Metric Tons	32,403	25,136	57,539	40,940	28,348	69,288
		% Ret. / Dis.	56.32%	43.68%	100.00%	59.09%	40.91%	100.00%
		% target mode	46.13%	83.17%	57.27%	49.63%	75.44%	57.71%
		% of Total	32.25%	25.02%	57.27%	34.10%	23.61%	57.71%
	CV	Metric Tons	37,840	5,087	42,927	41,546	9,231	50,777
		% Ret. / Dis.	88.15%	11.85%	100.00%	81.82%	18.18%	100.00%
		% target mode	53.87%	16.83%	42.73%	50.37%	24.56%	42.29%
		% of Total	37.66%	5.06%	42.73%	34.60%	7.69%	42.29%
	Total	Metric Tons	70,243	30,224	100,467	82,486	37,579	120,065
		% Ret. / Dis.	69.92%	30.08%	100.00%	68.70%	31.30%	100.00%
		% target mode	100.00%	100.00%	100.0%	100.00%	100.00%	100.00%
		% of Total	69.92%	30.08%	100.00%	68.70%	31.30%	100.00%
<p>% Ret. / Dis. is the retained, discarded or total trawl catch of Pacific cod for the year in that target fishery and delivery mode as a percent of the total trawl catch of Pacific cod by that delivery mode in the target fishery for the year (i.e. the row percent).</p> <p>% target mode is the retained, discarded, or total trawl catch of Pacific cod in the target fishery and delivery mode for the year as a percent of the total retained, total discarded, or total catch with trawl gear of all trawl target species for the year (i.e. column percent).</p> <p>% of Total is the retained, discarded, or total trawl catch of Pacific cod in the target fishery and delivery mode for the year as a percent of the total trawl catch of Pacific cod for the year (i.e. total percent).</p>								

Proposed Organization of the Analysis to Evaluate Allocations of Bering Sea Pacific Cod Among Gear Groups

Chapter 1 will introduce the issue and provide a brief summary of the history of the allocation. This will be followed with a detailed summary of the previous analysis, including the strengths and weakness of that analysis as they relate to the alternatives currently under consideration. Finally, the chapter will discuss the layout of the remainder of the document.

Chapter 2 will present information on Pacific cod biology and biological impacts. Pacific cod migration patterns and spawning activities will be studied and may assist analysts in determining where and when fishing is likely to occur, particularly if it is expected that the allocation may result in new or different patterns of fishing. Stock assessments will also be examined and forecasts of future TACs will be included. Finally, this chapter will briefly examine stocks and future TACs of alternative fisheries for the gears currently targeting Pacific cod. Crab stocks and future harvest levels will be assessed as alternative fisheries for pot vessels. Sablefish, turbot, and halibut stocks and future harvests will be examined as alternatives for hook and line vessels. Alternatives for trawl vessels which will be examined will include pollock, rock sole, yellowfin sole, and flathead sole.

Chapter 3 will focus on past Pacific cod fisheries. Catch composition by gear type in the directed Pacific cod fishery, bycatch of Pacific cod in other target fisheries, ex-vessel prices, ex-processor prices, and gross revenues will be discussed. PSC bycatch and mortality in these fisheries will also be summarized. Together, this information will be the basis of estimates of changes in net benefits to the nation. These data will also help determine the activities of the different sectors under the various alternatives, particularly in cases where the allocations are considerably different than under the current regulations.

Chapter 4 will discuss the assumptions and methodologies to be used in the discussion of the alternatives. There are several key assumptions which will shape the assessment, although other important assumptions will be made in the course of the analysis. Some of the more important expected assumptions are shown below:

- 1) It will be assumed that NMFS will manage TACs and apportionments in the same manner they currently employ. Of primary importance is NMFS strategy of anticipating the use of Pacific cod in other target fisheries. These bycatch needs are assessed when a closure of directed fishing for a target is imminent. Using Pacific cod as an example, NMFS will close directed fishing with trawl gear at a level somewhat less than the total apportionment, if it is expected that a significant amount of cod will be taken as bycatch in another fishery which is still ongoing or will occur later in the year, e.g. the pollock B-season, or the yellowfin sole fishery. In 1995, 23% of the all Pacific cod taken in the Bering Sea was caught as bycatch in other trawl target fisheries, mainly in the flatfish and pollock fisheries. If the apportionment to the trawl sector was set at an extremely low level (i.e., 29%), then it is possible that NMFS would not allow trawlers to target Pacific cod, but designate it as bycatch only at the start of the year.

It is also assumed that NMFS will continue to declare managed species as "prohibited" once the total allowable catch or total apportionment is taken. This implies that if a gear group's apportionment of Pacific cod is completely taken, and there are still target fisheries open to that gear group which take Pacific cod as bycatch, those target fisheries may be prosecuted, but all Pacific cod must be treated as a prohibited species and may not be retained. Since there is no set cap on Pacific cod as a prohibited species, Pacific cod catches will not cause a closure for other target fisheries, unless the catch of Pacific cod approaches the overfishing definition. Currently the over-fishing definition for Pacific cod is 1.5 times the size of the TAC.

However, as noted above, NMFS would estimate total bycatch needs early on, with the goal of not exceeding the TAC, regardless of whether taken as bycatch or in target fisheries.

Finally, it will be assumed that NMFS will continue to set a single halibut PSC cap for Pacific cod trawling, applicable to both trawl modes. Once the PSC cap is attained any closure will apply to both catcher processors and catcher vessels. Alternatively, the Council may wish to split PSC proportionately between catcher vessels and catcher processors, if they choose to make an explicit allocation by trawl delivery mode.

- 2) While the study will provide information regarding the catch and processing of Pacific cod in all target fisheries by all vessels and processors, the detailed analysis will focus on a few key fisheries in which significant amounts of Pacific cod are taken, specifically; Pacific cod fisheries with trawls, long lines, pots, and jigs, and trawl fisheries for pollock, rock sole, and yellowfin sole.
- 3) It is assumed that the diversity within the fishing and processing sectors can be captured with the vessel/processor classes used in analyses of the License Limitation Program for Crab and Groundfish and the Reauthorization of Inshore/Offshore for Pollock. At this point it appears that the analysis will focus on the following vessel and processing classes:

TH1: Trawl vessels generally greater than 125 feet, equipped with RSW tanks.

TH2: Trawl vessels generally greater than 90 feet, generally equipped with RSW tanks.

TH3: Trawl vessels greater than 58 feet but generally less than 90 feet.

PH1: Pot harvest vessels \geq 125' LOA.

PH2: Pot harvest vessels < 125' LOA.

GL2: Small skiffs (less than 32') limited to near shore fishing with jig gear.

LP1: Longline catcher/processors

CP1: Crab/Pot catcher processors

TP3: Trawl Catcher Processors limited to Head and Gut processing.

TP2: Trawl Catcher Processors with Head and Gut and Filleting capacity.

MP1: Motherships and Floating processors.

SP3: Shore plants in Dutch Harbor/Unalaska and Akutan.

The analysis has not proceeded far enough to determine whether additional vessel or processor types need to be included. However, it is anticipated that if a vessel or processor class accounts for more than 10% of a sector's activity then that vessel/processor class will be explicitly included in the study. For example, it may be that surimi factory trawlers (TP1) account for a significant amount (say 12%) of the trawl catcher/processor catch of Pacific cod. If this is indeed the case then that vessel class will be included. Motherships and shore plants are included because their inclusion will allow a more complete comparison of benefits resulting from the Pacific cod fishery. Without their inclusion ex-vessel net revenues of harvest only vessels would be compared to ex-processor net revenue of catcher/processors. Such an assessment would clearly favor catcher/processor over harvest only vessels.

- 4) Forecasts of catches and season length by gear/sector/class will employ estimates of catch per boat week at various times throughout the year based on our most recent data. It will be assumed that catches per boat week under "defined periods" will remain constant in future years. We will attempt to classify catches per boat week according to the fisheries which are open at the time. For example, one estimate of longline catch per boat week will be defined for the period between January 1 and the trawl opening date. Another estimate will be made for longline catch per week from the opening of the trawl season through the pollock A season. Hopefully, we will be able to estimate catches per boat week for discrete time periods throughout the year. With this information we can estimate catches and season lengths under changing apportionments and potentially account for changes in the numbers of vessels active in a given fishery.
- 5) The proportion of retained to total Pacific cod catch in each fishery in forecasted catches will be assumed equal to the most recent year of available data for each vessel and processor class. These retention rates for each target fishery will be calculated by season, and will take into account differences in the directed fishing status of Pacific cod. In other words, separate retention rates will be calculated for pollock A and B seasons. Further, if Pacific cod was closed to directed fishing during part of the B season, then two B-season retention rates would be calculated.
- 6) Ex-vessel prices, product mixes, recovery rates, and product prices by gear and sector will be assumed equal to the most recent year of data. As in the previous section we will attempt to differentiate product mixes by seasons and fishery status. For example, production rates and mixes in the Pacific cod target fishery are likely to vary from those when Pacific cod is a bycatch species.
- 7) In general we will assume that catching and processing costs are unchanged from those in the original 1992/1993 analysis of the Pacific cod allocation. We will however also discuss the implications of that assumption and will discuss the potential impacts of changes to that assumption. Other possible assumptions regarding cost include: a) changes of equal magnitude across all sectors, b) changes of equal proportion across all sectors, c) changes which are disproportionate and of unequal magnitudes.

There are some vessel/processor classes for which cost information was not estimated in the earlier study. In these instances we will employ the best available data, which in most cases will be data collected in the OMB survey for the Inshore/Offshore analysis. There is a possibility that information collected by the Alaska Fishery Science Center as a part of the initial analysis of IFQs under CRP could be used, or that some limited additional cost information could be collected.

- 8) Estimates of net benefits will include impacts on the Pacific cod target fisheries including opportunity costs of halibut, crab, and other groundfish bycatch. We will also include indirect impacts on other target fisheries. As one example, we will assume that an increased allocation of Pacific cod for the trawl fisheries would increase the amount of pollock caught as bycatch. This would reduce the amount of pollock available for the Pollock B-season.
- 9) Estimates of community impacts will likely be qualitative rather than quantitative. For each vessel or processor type we will discuss ownership and employment patterns based on information in the "Sector Description and Preliminary Social Impact Assessment" prepared by Impact Assessment, Inc. for the analysis of the CRP. We will also use information contained in the original inshore/offshore analysis and in the "Faces of the Fisheries/Community Profiles" booklets. To the extent possible we will attempt to quantify differential impact to communities of the various alternatives.
- 10) For purposes of this analysis, we assume that CDQ allocations of Pacific cod approved by the Council with the License Program will also be approved by the Secretary of Commerce and will be implemented in 1998. The CDQ allocations will "come off the top" prior to gear allocations. Further, CDQ allocations will not be encumbered by the gear split and may be used in whichever manner desired by the various CDQ groups.

Chapter 5 of the analysis will examine the potential impacts of Alternative 1, the "no action" alternative. This involves predicting the amount each sector would harvest were there no explicit allocations, and would include projections under future TACs. Forecasts will be based on the assumptions discussed in the previous chapter, and particularly on closure dates from the 1995 fishery. If a closure was due to the attainment of a particular Pacific cod apportionment, then we will assume that, under Alternative 1, the fishery would have continued, thereby reducing the season length of the other sectors. If closures were the result of attainment of PSC caps then that closure would stand. Once catches are determined we will estimate benefits and impacts based on the assumptions outlined above.

Chapters 6 through 11 will examine the potential impacts of Alternatives 2a, 2b, and 2c through Alternatives 7a, 7b and 7c. Each of these chapters will follow the same general outline. First we will examine the impacts on the jig and fixed gears. Direct impacts for these gears should be the same regardless of the sub-allocation between trawl vessels, although there may be some less apparent indirect impacts. There is a possibility that under the extreme allocations there may be some impact on other target fisheries in which these gears participate. Additionally it is possible that under the largest apportionment options the TAC might not be harvested. These possibilities will also be identified where applicable. The examination of fixed and jig gear apportionments will involve predictions of season lengths, catches, ex-vessel revenues, processing revenues, and, given the assumptions regarding costs, estimates of net revenues. Finally community impacts will be discussed.

Within each chapter there will be separate sections dealing with the three different options for sub-allocations to the trawl vessels. For each option the same types of estimates as above will be made. It is expected that these predictions will be much more complex because of the other fisheries in which cod are taken, and because of the additional targets available for the trawl vessels.

It is anticipated that for each alternative and sub-alternative discussed in Chapters 4-11, estimates and discussion of the following will be included:

- 1) Estimated retained, discarded, and total catch of Pacific cod by gear type, vessel/processor class, delivery mode, and target fishery.
- 2) Estimated retained, discarded, and total catch of groundfish by species in the Pacific cod fishery by gear type, vessel/processor class, and delivery mode.
- 3) Prohibited species bycatch in the Pacific cod fishery by gear type, vessel/processor class, and delivery mode. If the allocation impacts PSCs in other target fisheries, then these will be reported as well.
- 3) Impacts on other target fisheries due to changes in catches in the Pacific cod fishery.
- 4) Biological and other environmental effects, if these are measurable.
- 5) Estimated ex-vessel gross revenues by gear and vessel/processor class in all affected fisheries.
- 6) Estimated production and product revenue by processor class in all affected fisheries.
- 7) Estimated changes in harvesting and processing costs by vessel/processing in all affected fisheries.
- 8) Estimated changes in net harvesting and processing revenue.
- 9) Discussions of other non-quantifiable impacts, costs, and benefits.
- 10) Estimates of income by community.

The final chapter, Chapter 12, will contain a comparison of the alternatives and a summary of the findings and conclusions. This chapter will also have sections containing the formal EA/RIR, the assessment of conformity to E.O. 12866, and implications of the alternatives with respect to other applicable laws.

MIDWATER TRAWLERS COOPERATIVE

1626 N. COAST HIGHWAY-NEWPORT, OREGON 97365

AGENDA C-1
JANUARY 1996
Supplemental

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MARATHON
MESSIAH
MISS AMY
MISS BERDIE
MISS LEONA
MISS SARAH
MISS SUE
NEW LIFE
PACIFIC
PACIFIC FUTURE
PACIFIC RAM
PEGASUS
PERSEVERANCE
PERSISTENCE
PIONEER
PREDATOR
RAVEN
ROSELLA
SEADAWN
SEA EAGLE
SEEKER
TRAVELER
VANGUARD
VIKING EXPLORER

January 20, 1996

North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, AK 99501

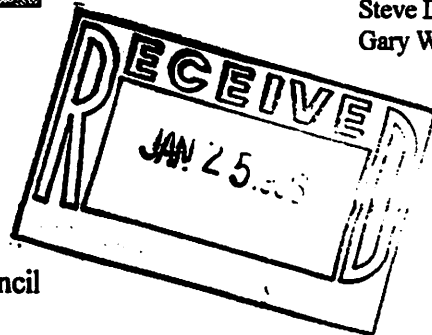
ATTN: Mr. Richard Lauber, Chairman

RE: January Agenda Item C-1, BSAI Pacific Cod Allocations

Dear Chairman Lauber and Council Members:

This item is on the agenda for the Council to review the analytical outline and scope of work that the staff will be following during the next several months in preparing for the April and June Council meetings, when the decisions will be made. This issue is critical to MTC for the reason that a majority of our members fish Pacific cod and depend upon that resource for a substantial portion of their annual income. The purpose of this letter is not to argue the merits of any particular allocation plan at this time, but rather to urge the Council to make certain that the analysis that is performed during the next several months is adequate so as to permit you to make an informed decision in June.

In that regard, at the December Council meeting, Steve Hughes and myself brought before you a proposal to analyze a split of the trawl gear allocation between trawl catcher vessels and trawl catcher/processor vessels. The reason for this request is that it has become apparent from NMFS data that there is a dramatic difference in the cod discard rate between catcher vessels and catcher/processors. The degree of difference is truly significant in that it appears that trawl catcher/processor vessels have more than double the discard rate as compared to catcher vessels delivering shoreside and to motherships.



January 20, 1996

This discard rate difference within the trawl sector is extremely important for the reason that the fixed gear groups are using discards of cod as the primary justification for the Council to consider reallocating a portion of the trawl sector's cod quota to the fixed gear sector. Therefore, if this is to be a substantial foundation for the reallocation decision, an analysis which does not include such a dramatic difference between the trawl sectors, which is already clearly reflected within the NMFS data, would potentially cause the entire analysis to be defective and jeopardize the Council's ability to make an equitable reallocation decision in June.

This issue is critical to trawl catcher vessels which have historic participation in the fishery, dating back to the early 1980s, and is also critical to the markets to which these vessels deliver. It should be noted that any reduction in the portion of the cod available to catcher vessels will have serious adverse implications to the employment opportunities in the State of Alaska and to the coastal communities where most of this cod is processed.

It is for these reasons that we ask you to direct that the analysis of the proposed split of the trawl gear allocation between catcher vessels and catcher/processors proceed along the same time lines as the analysis of the BSAI Pacific Cod allocation issue as a whole. This is the only way that the analysis will be complete and sufficient to justify any changes in the current allocation of cod between gear types.

We understand that there are constraints because of limited staff time available to perform Council work. Therefore, although we support the continuation of the IBQ/VBA analysis we would be willing to support a delay of that analysis until this summer if that is necessary to provide adequate staff time to perform the work necessary on the cod allocation issue. The cod issue is an issue which will be decided by the Council this year and will have immediate impacts on industry, whereas the IBQ/VBA program, although extremely important, is at least two years out as far as any implementation and, therefore, should be delayed at this time if necessary to provide staff for this cod issue.

Thank you for considering our comments.

Sincerely,

MIDWATER TRAWLERS COOPERATIVE

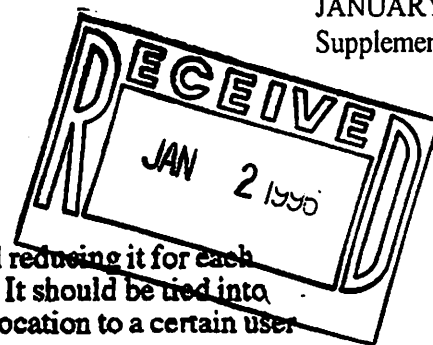


Fred A. Yeck
Vice President

DAVID HILLSTRAND
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AGENDA C-1
JANUARY 1996
Supplemental

NORTH PACIFIC FISHERIES MANAGEMENT COUNCIL
Attention: RICHARD LAUBER



Agenda item C-1; BSAI Pacific Cod Allocations

Allocations of the fisheries are tied into cleaning up bycatch, and reducing it for each fisheries by fishing for a species with the cleanest gear possible. It should be tied into improved Retention/Utilization also. In this regard it is not an allocation to a certain user group; which would have sole access to the resource.

In one case that of fixed gear; and pots to be more specific, those who use trawl gear can switch to fixed gear and still participate. In this case it is an allocation of a species to gear types, and not to a certain group.

At this point the NPFMC should see to proceed with improving retention and utilization and cleaning up the way we fish, along with preserving habitat. To stay stuck on saying it is an allocation and not continuing further in talking about it would not be a prudent discussion for the Council.

In options 1-4 on page #9 of the NPFMC newsletter I would recommend to the NPFMC to chose #2. with the latter portion of 44%/54%/2%

A. As of yet the Jig gear is having a hard time catching the 2% allocated to that gear type.

B. With fixed gear where both longline and pots are included, we see the allocation being taken with the existing 54%/44%/2%.

C. The longline fleet has a halibut PSC that shut it down, the IFQ system for Halibut and Sablefish which help to reduce bycatch, and help in postponing and extending the season. Yet they are still shut down early and have a continued bycatch problem.

D. The pot gear is being used mostly by crab vessels; which we see maxing out their crab fisheries first then switching to cod. As the crab stocks decline further we will see their effort concentrating upon the cod resource for income. At this time we can still improve our pots and reduce our bycatch further by putting a 3" inch opening in the back or front of our pots; there by allowing crab and halibut a way of escape while still retaining Pacific Cod. The amount of money and the time we are allowed to fish for P. Cod is prohibiting the fleet from doing so right now, especially in the GOA P.Cod fisheries. But to reduce bycatch further and improve retention of what we catch the NPFMC should consider another gear change to the pot gear, only if more of the quota is allocated to pot gear.

E. The Trawl fleet has a hard time catching their portion of the P.Cod; this is do to the PSC of Halibut, and crab. To increase their allocation would be useless. But to encourage them to switch gear types is a practical solution to cleaning up bycatch and improving our retention of P.Cod. The NPFMC encourages the fleet to clean up bycatch when a allocation is made. The license limitation system allows for the vessels to switch to fixed gear from the trawl gear. We will see an improvement of bycatch with Vessel Bycatch Accounts also in the trawl fisheries, but they will only be that of being able to catch the allocation of P.Cod; which is all ready present before the Council.

The NPFMC should see the long term affect of cleaning up bycatch instead of the arguing over changing the way we fish, and our complaining about it. You should focus your attention to improving the fisheries, and have a further look at a balanced comprehensive rational plan that you are trying to achieve. This is especially true with IFQ's being so desired by the NPFMC. To allow them before you clean up the way we fish to the best extent of the Councils authority would be wrong.

It is in our best interest to slow the fisheries down and to clean up our fishing practices where ever we can. In some fisheries it is impractical to do so with changing gear types, but in fisheries where ever it is possible I would recommend it highly! The P. Cod fisheries is one of them. For this is a fisheries that can be caught with pots, and where even the pot gear can improve its bycatch; becoming one of the cleanest gear types to be used.

Mr. Clarence Pautzke, has recently told the NPFMC that he wants to see our retention improved and our bycatch cleaned up. I know our Senators and Congressman and our President would send the message to you to proceed with doing so also; as well as the American public.

In this light and in this regard I would like to bring up the Gulf of Alaska, especially the P. Cod fisheries! The quota or TAC is only around 50,000 metric tons; a quota that is able to be caught with Fixed gear. This would greatly improve halibut Bycatch and Habitat preservation!

As of right now the fisheries is managed with out allocations to gear types; so it is said. Yet each year we see the season closing with 5000 metric tons of P.Cod for trawler bycatch for the remainder of the year. We do see the trawl gear closing after they reach their PSC of halibut, but we do not see the pot gear being able to fish the remainder of the quota.

If the NPFMC is going to reserve between 5000-6000 metric tons of P. Cod for the trawl gear off of the quota or TAC then it should also be done for the pot gear.

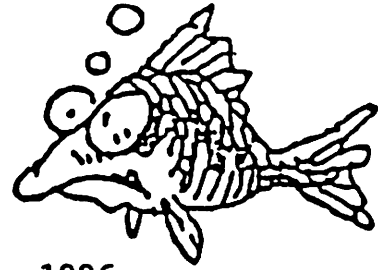
I do realize that the fixed gear is allowed to fish earlier at the start of the year and again in the fall on any remaining portion, but so would the trawl vessels if they switched to pots.

Crab Bycatch has been reduced by the trawl fleet mostly because of the areas that they are allowed to fish, not because of how they fish.

I would encourage the NPFMC to make an amendment to bring some sort of P. Cod allocation to gear types in the GOA. For safety and for cleaning up bycatch, and preserving habitat, as well as bring to our nation the most profit for the resource.


David Hillstrand

North
Pacific
Longline
Association



January 30, 1996

Mr. Richard B. Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Avenue
Anchorage, AK

RE: Analysis of BSAI Cod Gear Split

Dear Rick:

The split of BSAI cod TAC between fixed gear and trawl gear sundowns at the end of 1996. Changed circumstances surrounding the fishery require that a new analysis be performed and that the issue be readdressed.

Something which we cannot afford to ignore is the sea change in public opinion and in Congress regarding bycatch, discards, and fishery conservation generally. H.R. 39 not only calls for reduction of bycatch in its Findings, Purposes and Policies, but also includes a new National Standard requiring that conservation and management measures shall minimize bycatch. Floor amendments passed by a wide margin require consideration of habitat in FMPs, prohibit fishing over MSY, and actually require the use of turtle and fish excluder devices in the Gulf shrimp fishery (Congressional micromanagement!). Republicans supported these amendments overwhelmingly, and the final vote on the bill was 388-37.

The language of Kevin O'Leary's December motion on BSAI cod allocation reflected these themes: "The staff analysis should carefully address the biological, economic, and regulatory changes in the fishery since Amendment 24 went into effect, with specific focus on PSC mortality, impacts on habitat, other bycatch, and discards of cod and other groundfish." The problem is one of bycatch, associated mortality, and discards.

The advantages of fixed gear fishing - reduction in prohibited species mortality, reduction in discards of other fish, size selectivity, species selectivity, improved product quality, preservation of the benthic environment, minimal fishing on spawning stocks - are detailed in the June 3, 1991 petition from the North Pacific Fixed Gear Coalition and in "Reduction of Halibut Bycatch and Associated Mortality in the Bering Sea cod Fishery," attached.

Please consider the following:

Regulatory History

During the 1980's the Council's Fish 'n Chips Policy delayed development of the United States freezer-longliner fleet. Continuing allocations of cod to Japanese longliners prevented U.S. fishermen from breaking into the lucrative Japanese market for cod. This situation did not change - and the U.S. longliner fleet did not begin to grow - until 1989.

But for this policy, freezer-longliners would have a much more substantial catch history in a variety of fisheries. The fisheries for halibut and sablefish are an excellent example. because of their lack of catch history, large freezer-longliners were given very little ITQ for these species - and they are prohibited by regulation from buying shares from smaller vessels.

Inshore/Offshore denied freezer-longliners 125' and longer access to the GOA cod fishery. These vessels lost 100% of their GOA fishery without benefit of any analysis of the negative economic impacts of the measure (they were included in the "inshore" sector for purposes of analysis), and without any opportunity to negotiate a compromise. A federal court refused to grant relief.

In 1993 the Council voted to split the BSAI cod TAC between fixed and trawl gear - 44% to fixed gear, 54% to trawl gear, 2% to jig gear. We anticipated that a moratorium would follow, preventing the entrance of more vessels into the fixed gear fishery. It now barely supports the freezer-longliner fleet (at any given time about 31 active vessels) and a handful of pot boats. In implementing the Moratorium, however, the Council allowed some 200 vessels to cross over into the groundfish fisheries. There was no industry negotiation, little consideration of the negative impacts on the freezer-longliner fishery.

Under License Limitation an unknown number of speculative entrants were admitted to the fixed gear fishery. In each case many of the vessels had no history of fishing for cod, and no dependence on the fishery. Again there was no industry negotiation, no focus on negative impacts on the freezer-longliner fleet.

These measures have a direct allocative effect - taking cod away from the freezer-longliner fleet, and giving it to others. Unless the longliners are compensated for these losses and rewarded for clean fishing through greater access to the BSAI fishery for cod - the only fishery available to large freezer-longliners as a practical matter - they will be forced out of business. Please see testimony of Dr. David Fluharty, attached.

Potential Halibut Savings

For purposes of illustration only, consider how much halibut would be saved if the BSAI cod fishery were prosecuted by fixed

gear fishermen. In 1995 longliners caught 103,906 mt of cod (discarding 7,041 mt, NMFS) in 28 weeks of fishing - an average of 3,710 mt per week. There are only 35 weeks of potential fishing for longliners in the BSAI each year because the fishery is closed for 17 weeks during the summer to avoid halibut. If longliners were rewarded for clean fishing and/or compensated for losses in the Gulf, they would fish only seven more weeks than they did in 1995 ($35-28=7$), and would harvest only 26,000 mt of additional cod ($7 \times 3,710=25,970$). Total longliner harvest would be about 130,000 mt ($103,906+25,970=129,876$) - their maximum possible take. Some 994 mt of halibut mortality would be required to support this take, at 1995 halibut mortality rates.

This scenario would leave 150,000 mt of cod on the table in 1996. Pot fishermen harvested 19,517 mt of BSAI cod in 1995, killing only 9 mt of halibut. Pot fishermen could harvest 150,000 mt of cod with 69 mt of halibut mortality. The entire BSAI cod TAC of 280,000 mt could be harvested by longliners and pot fishermen with 1,136 mt of halibut mortality ($994+69=1,063$).

In 1996 the BSAI cod TAC will be harvested by a combination of trawl and fixed gear - and a reasonable assumption is that trawlers will use 1,685 mt of halibut PSC, longliners will use 800 mt (the amounts specified), pot boats will use (a guess) 25. The total halibut mortality will be about 2,510 mt. If the TAC were taken with fixed gear, as above, 1,447 mt of halibut would be saved.

We do not expect the Council will rule that the entire BSAI cod TAC will be taken by fixed gear. To calculate the amount of halibut PSC saved by any selected fixed gear percentage, you have only to multiply 1,447 mt by that percentage.

Savings of Other Species

Examination of the NMFS pie charts for the 1993 BSAI trawl and hook-and-line groundfish fisheries reveals that savings of non-prohibited species would also be substantial in a fixed-gear-only fishery (See Reduction of Halibut Bycatch... attached; these were the only pie chart bycatch breakdowns available from NMFS). As of 9/4/93, 50,811 mt of fish had been discarded in the trawl cod fishery, while 51,995 mt were retained. Some 27,294 mt of pollock and 7,006 mt of cod had been discarded. By comparison, 14,166 mt of fish had been discarded in the hook-and-line cod fishery, while 63,145 mt were retained. Only 1,809 mt of pollock and 4,145 mt of cod were discarded. (Source: NMFS)

In 1995, 37,529 mt of cod were discarded in the BSAI trawl fishery for cod (NMFS) - a lot of cod could be saved by expanding the fixed gear fishery.

Alternative Uses of Halibut Savings

The large savings of halibut could be used in several ways. All or part could be returned to the directed fishery. All or part could be used to develop or extend other trawl fisheries. Part could go to the hook-and-line fishery to reward and encourage clean fishing.

No Complex Regulations

Expansion of the fixed-gear-only cod fishery in the BSAI would require no complex or expensive regulations, would require no special enforcement effort. In the BSAI cod fishery this measure would do much to accomplish the purposes of Harvest Priority and Vessel Bycatch Accounting proposals (reward clean fishing, reduction of prohibited species bycatch) without raising insurmountable problems of due process and proof.

Changed Circumstances - New Analysis Required

The original EA/RIR for the gear split on BSAI cod was prepared in 1992-1993. Significant changes in the biological, economic and regulatory environment since then require a new analysis of the cod split issue:

Status of Stocks, BSAI Cod - In 1992-1993 BSAI cod stocks were at a low level, and declining. By 1995 they had increased significantly:

	Year	ABC	TAC
BSAI Cod (mt)	1992	182,000	176,700
	1993	164,500	164,500
	1994	191,000	191,000
	1995	328,000	250,000

Status of Stocks, BSAI Crab - In 1992-1993 BSAI crab stocks were at high levels, but have since decreased drastically (figures in millions of pounds):

	Year	GHL	Catch
Red King Crab	1992	10.3	8.0
	1993	16.8	14.6
	1994	0	0
	1995	0	0
Opilio	1992	333	313
	1993	207.2	230.8
	1994	105.8	140
	1995	55.7	70
Bairdi	1992	39.2	35.1
	1993	19.8	18

1994	7.5	8
1995	5	?

Not only will these declines in GHL's give impetus to the expansion of the pot fishery for cod, the strike over price will assure that pot fishermen will be looking for new opportunities.

Markets - The primary traditional market for head-and-gut cod has been Japan, where premium prices have been paid for high quality product. These prices have declined from a high of \$1.20 to \$1.25 per pound (7-8 fish per case) in the fall of 1991 to a low of \$0.75 to \$0.80 in 1995 - a drop of something like 40%.

Another current development with serious negative potential is the establishment for the first time of a Japanese Import Quota (IQ) for Russian cod. Demand for cod in Japan is fixed, and until now the importation of Russian product was prohibited. Expansion of the Russian IQ could have a serious impact on U.S. cod producers.

Regulatory Changes

Please see "Regulatory History," above.

Conclusion

Council management policies in the days of foreign fishing inhibited the growth of the freezer-longliner fleet. We now find our fishery threatened by our exclusion from the GOA, and by the admission to it of an unknown number of pot boats. The public and Congress have let it be known that they want absolute reductions in bycatch, discards and waste. We are hopeful that the Council will recognize these facts and take action to compensate us for our loss in the GOA and our potential loss to pot fishermen, reward us for our successful efforts in reducing halibut mortality, and achieve substantial savings of halibut and other species now lost in the BSAI cod fishery. Expansion of the fixed-gear fishery for cod will accomplish these goals without the necessity for expensive and problematic regulations focusing on individual vessels.

Sincerely,



Thorn Smith

CONFERENCE BOARD RESOLUTION

WHEREAS the North Pacific Fishery Management Council is now reconsidering the regulatory split of Bering Sea/Aleutian Islands Area (BSAI) cod TAC between fixed gear (longline and pot) and trawl gear; and

WHEREAS Canadian and American halibut fishermen have repeatedly asked for reduction of halibut bycatch and mortality in the groundfish fisheries off Alaska; and

WHEREAS halibut bycatch mortality in the BSAI trawl fishery for cod is the largest single source of trawl halibut mortality in that area, 45% of the 3,775 mt trawl Prohibited Species Cap (PSC); and

WHEREAS halibut mortality (PSC) allowed in the BSAI trawl fishery for cod has increased steadily over the last three years from 1,200 mt in 1994, to 1,550 in 1995, to 1,685 in 1996; and

WHEREAS assumed mortality rates for trawl caught halibut remains high at 63%; and

WHEREAS in 1995 hook-and-line fishermen reduced their assumed halibut mortality rate from 18% to 11.5% through an industry-sponsored careful release program; and

WHEREAS pot vessels fishing for cod achieve even lower halibut bycatch and mortality rates; and

WHEREAS decline in BSAI crab stocks will cause many pot fishermen to move into the cod fishery; and

WHEREAS the increased use of fixed gear in the BSAI cod fishery would save a significant amount of halibut; and

WHEREAS there is enough longline and pot gear available to harvest a significantly larger portion of cod TAC; and

WHEREAS implementation of such a program would require no expensive and problematic regulations focusing on individual vessels; it is hereby

BE IT RESOLVED that the Conference Board respectively requests the Commission to recommend to the North Pacific Fishery Management Council and the National Marine Fisheries Service that the portion of the BSAI cod TAC allocation to fixed gear be increased substantially.

BE IT FURTHER RESOLVED that the reduction of halibut mortality in the Bering Sea/Aleutian Island cod fishery would be used directly to lower Bering Sea/Aleutian Island halibut mortality caps.

To: DCS@IRO@FAK[THORN SMITH (p0)\FAX:82062824684]
From: Andy Smoker@FM@FAK
Subject:
Date: Friday, January 26, 1996 at 2:02:35 pm AKS
Attach:
Certify: N

-----[Message Follows]-----

GEAR	TYPE	SumOfTONS
HAL	D	7,041
HAL	R	96,865
JIG	R	571
POT	D	311
POT	R	19,517
TRW	D	37,529
TRW	R	82,486

GEAR	SumOfHAL	MORT
HAL	795	
JIG	-	
POT		9
TRW	1,525	

Testimony of Dr. David Fluharty, NPFMC

June, 1995

Chairman Lauber: Are there any other items under that...Dr. Fluharty.

David Fluharty: This is just to...along these same lines...just to raise a point. It's not a proposal...a proposed amendment, but just to draw the Council's attention to something that, through analysis, I think we ought to be aware of. And whether we can do anything about it at this time, I'm not sure. But I'd like to state for the record, my concerns about the cumulative impacts of Council actions on the freezer-longliner fleet and the BSAI fixed-gear cod fishery. First, under the moratorium, which was intended to stabilize fisheries, we allowed approximately 200 vessels to cross over into the groundfish fisheries. These are vessels, in many cases, with no catch history or no dependence on those fisheries. Second, under license limitation, we've allowed speculative entry into fixed gear fishing, by what is, I believe to be an unknown number of boats. It seems that we really don't know what the effect of this is. During public testimony we've heard, in the BSAI fixed gear fishery...that the BSAI fixed gear fishery barely supports 30 freezer-longliners and a handful of pot vessels. The addition of the new vessels into this fishery could at least double the fleet size, if not the effort, and thereby destabilize the fishery. Third, under the inshore-offshore

(Fluharty, continued) and license limitation programs, we have permanently excluded large freezer-longliners from the Gulf of Alaska. And I'm concerned about the stability of this fleet. I think that the cumulative actions have been major, and that we should be aware of that. Thank you.

**CANADIAN STATEMENT TO THE NORTH PACIFIC
FISHERY MANAGEMENT COUNCIL
SEATTLE, SEPTEMBER 25-27, 1995**

1. Canada's major concern continues to be the high levels of halibut bycatches occurring in International Pacific Halibut Convention (IPHC) waters. High levels of halibut bycatch mortality in the U.S. groundfish fisheries both off Alaska and Washington-Oregon are adversely affecting the Canadian halibut fishery. These bycatches are seriously reducing Canadian catch opportunities and harming the state of the halibut resource. Canadian halibut fishermen are penalized for high Alaskan bycatches, losing over two million pounds.
2. The United States Government failed in 1994 to meet previous undertakings to reduce by 10 percent annually the level of bycatch mortality in its groundfish fisheries, primarily in the Gulf of Alaska and the Bering Sea/Aleutians. Canada has continued to urge U.S. authorities to recommit to a phased reduction of 10 percent annually in its halibut bycatch mortality as agreed in 1991. We understand that the United States Government continues to regard this issue seriously and has taken extensive and costly measures to address the problem.
3. Individuals and organizations in Canada and Alaska have actively promoted more responsible fishing practices such as "careful release" for hook and line vessels and sorting grids and trawl nets with lower bycatch rates. We also note that there is a workshop on solving by-catch issues taking place this week in Seattle which will provide technical information and fishing techniques to reduce bycatch.
4. However the halibut bycatch mortality caps in Alaska have continued at the same level for several years in spite of the Canada-U.S. agreement in the IPHC to reduce this bycatch. From Canada's perspective there appears to be an indifference to the seriousness of the bycatch problem by the fisheries managers of the Alaskan fishery.
5. It is noted that to date the Bering Sea trawl fishery has taken about 3350t from the 3775t halibut bycatch mortality cap. Canada requests that the Bering Sea groundfish trawl fishery be closed immediately in order to

- 2 -

ensure that the halibut bycatch reduction targets pledged earlier in 1995 can be implemented. This would demonstrate to the groundfish fleet in the Bering Sea that each gear sector, whether hook and line or trawl or groundfish pot, must be accountable for its own bycatch, and thus promote more responsible fishing practices.

**Reduction of Halibut Bycatch and Associated Mortality
in the Bering Sea Cod Fishery**

William Thornton Smith

**North Pacific Longline Association
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Suite 300
Seattle, WA 98199
TEL (206) 282-4639
FAX (206) 282-4684**

Reduction of Halibut Bycatch and Associated Mortality in the Bering Sea Cod Fishery - Abstract

In 1981 the Bering Sea Groundfish Plan Team of the North Pacific Fishery Management Council (NPFMC) recommended that if hook-and-line gear rather than trawl gear were used to prosecute demersal fisheries in the Bering Sea/Aleutian Islands Area (BSAI), significant bycatches of halibut, salmon and crab would be virtually eliminated. Halibut bycatch remains a significant problem in the cod fishery. Longliners fishing for cod in the BSAI prevailed upon the National Marine Fisheries Service to implement a "Careful Release Program" which requires by regulation that all halibut bycatch on longliners be released by one of three techniques - shaking, hook straightening, gangion cutting. Working with Fisheries Information Services of Juneau, Alaska, the freezer-longliner fleet established a real-time communication system to calculate halibut mortality rates for each vessel, and to communicate that information to the captains. In its first five months of operation this program reduced halibut bycatch mortality from 18% to 11.5% - a 36% reduction, with only 2/3 of the fleet participating. Further reductions are anticipated. The NPFMC has been asked to consider expansion of the use of fixed gear (hook-and-line and pots) in the BSAI cod fishery. If the directed fishery for cod in the BSAI were conducted with fixed gear only, more than 1,000 mt of halibut would be saved each year.

Introduction

The bycatch dilemma in the Bering Sea groundfish fisheries is, as Casey Stengel would have put it, "deja vu all over again." Bycatch and discards in the successive trawl fisheries - foreign, joint venture, and domestic - have repeatedly brought turmoil, headlines, and extensive regulation to our industry. It is time to explore the use of passive gear in harvesting groundfish - particularly in the Bering Sea/Aleutian Islands (BSAI) fishery for Pacific cod.

The Problem - Prohibited Species

Prohibited species are those fully utilized in directed fisheries, such as crab, salmon, halibut and herring. Regulations implementing the Fishery Management Plan (FMP) for Groundfish of the BSAI require that all such species caught in other directed fisheries must be returned to the sea in the best condition possible.

In the late 1970's foreign trawlers dominated the groundfish fisheries off Alaska. Prohibited species bycatch in these fisheries, particularly salmon bycatch, was so great that in 1980 Alaska native groups sued the Secretary of Commerce challenging the adequacy of federal regulations addressing bycatch in the BSAI. A flurry of restrictive regulation followed. During the 1980's a similar problem arose in the joint venture trawl fisheries. Bycatch of crab was so great in the BSAI that a new trade association was formed to protect crab interests, and a significant trawl closure was imposed. Today bycatch and discard of prohibited species, target species, and other species in the domestic BSAI trawl fisheries is front-page news. In fishery management it seems as though George Santayana's famous dictum has gone unheard - "Those who cannot remember history are condemned to repeat it."

Prohibited Species Catch Limitations

The North Pacific Fishery Management Council regulates the fisheries in the Exclusive Economic Zone off Alaska. In a direct attempt to limit prohibited species bycatch, the Council has established prohibited species catch mortality limits or caps (PSC's), for the various fisheries in the BSAI. The trawl industry has an overall halibut PSC cap of 3,775 mt, which is allocated to various target fisheries. In 1995 1,550 mt, or 41% of this overall cap has been allocated to the trawl fishery for cod. This is the largest single allocation by a wide margin. The cod quota available to trawlers is 135,000 mt, only 7.2 % of the total groundfish quota available to trawlers - some 1,880,000 mt. The hook-and-line fisheries have an overall halibut PSC cap of 900 mt, 725 mt of which is devoted to the fishery for cod. Cod will account for 98% of the longline catch in the BSAI in 1995. (Source: Fisheries Information Services) If there is a logical place to reduce halibut mortality in the BSAI groundfish

fisheries, it is the trawl fishery for cod.

Other Attempted Regulatory Solutions

Other regulatory attempts to resolve these bycatch and discard problems are legion. Time and area closures, often linked to PSC's, have been or are being imposed on the trawl fisheries with such regularity that a regulatory chart of the BSAI area resembles nothing so much as a patchwork quilt. There is a permanent Pribilof trawl closure to protect blue king crab, and a permanent closed area to protect red king crab is being developed to supplement existing Prohibited Species Bycatch Limitation Zones and PSC caps - the caps are subdivided among the various trawl fisheries. Recently an emergency rule implemented a closed area to protect king crab during the fishery for roe rock sole. There are Tanner crab PSC Bycatch Limitation Zones, and PSC caps similarly subdivided. Halibut PSC caps apply to both longliners and trawlers, are apportioned among various target fisheries, and are allocated seasonally. There is a Summer Herring Savings Area 1, a Summer Herring Savings Area 2, and a Winter Herring Savings Area. All trawling is prohibited in these areas when a herring PSC limit is attained. There is a Chum Salmon Savings Area. A Chinook Salmon PSC Reduction Plan is awaiting approval by the Secretary of Commerce. The list goes on and on, and is summarized in a current DRAFT "APPENDIX D" to the BSAI Groundfish FMP.

Further regulatory initiatives have been undertaken, often at the insistence of industry, aimed at controlling trawl bycatch. "Pelagic trawls," designed to avoid bycatch by staying off the bottom, just didn't work. The Vessel Incentive Program, aimed at penalizing individual vessels which exceed established bycatch standards, is widely accounted a failure - a victim of insurmountable practical problems of proof and due process that render any program aimed at individual vessels impracticable. It is claimed that wide-mesh cod ends will release juvenile fish, but preliminary investigations indicate that the survival of juvenile pollock strained through a cod end is zero. The fish become disoriented and are subject to predation. Sorting grids over fish holds may save large halibut, but the small ones - which are the real concern - will pass through. In sum, these measures are of questionable value in reducing bycatch and associated mortality to any substantial degree.

The effectiveness of these measures can perhaps best be evaluated by examining the reasons for trawl fishery closures over recent years. DRAFT APPENDIX D to the BSAI groundfish FMP, mentioned above, shows that since 1992 many major trawl fisheries have been shut down because PSC limits for halibut, red king crab or Tanner crab were reached (see Tables 5 through 8). From this fact alone we can infer that generally speaking, efforts to reduce prohibited species bycatch aren't working very well. Halibut bycatch and mortality rates in the BSAI trawl fishery for cod remain essentially unchanged. (Source: FIS; see NMFS graphic, 1995 BSAI Halibut Bycatch Mortality, Trawl)

The Problem - Target and Other Species

Bycatch and discard of prohibited species is only part of the problem. Loud public protests have lately bemoaned the observed discard of other species in the trawl fishery - which ranged from 275,000 to 300,000 mt annually in the BSAI from 1992-1994 - as much as 660,000,000 pounds. (Source: NMFS) Significant amounts of pollock and cod are discarded in the directed BSAI trawl fishery for cod. Discards in the hook-and-line fishery are miniscule by comparison. (Please see NMFS pie charts)

The Fixed Gear Solution - Theory

A considerable uproar followed the filing of the Alaska native lawsuit challenging federal management of prohibited species bycatch in the trawl fisheries. The North Pacific Fishery Management Council appointed an Ad Hoc Working Group on Prohibited Species, which working with the Council's Scientific and Statistical Committee, produced Council Document #13, REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES BY FOREIGN GROUND FISH FISHERIES IN THE BERING SEA (April 1981) - a collection of scientific papers describing the prohibited species bycatch problems and suggesting solutions. One of the papers, reproduced as International Pacific Halibut Commission (IPHC) Technical Report No.19, is entitled REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES IN THE BERING SEA GROUND FISH FISHERY THROUGH GEAR RESTRICTIONS. It observes that the incidental catch of prohibited species is much less with longlines or off-bottom trawls (truly pelagic trawls which do not touch the bottom) than with on-bottom trawls, and recommended consideration of two management alternatives involving gear restrictions:

- (1) Prohibit on-bottom trawls in all areas, i.e. groundfish will be harvested only with longlines and off-bottom trawls; and
- (2) On-bottom trawl gear will be allowed only in areas defined as yellowfin sole or turbot grounds.

Analysis revealed that the estimated savings of prohibited species would be dramatic. Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%, Tanner crab and king crab catches by 99%, and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species, but the reductions were less than for alternative (1).

The Fixed Gear Solution - Practice

In June of 1991 the North Pacific Fixed Gear Coalition petitioned the Council to give fixed gear preferential access to demersal groundfish species, based on these conservation considerations. The petition may be found in TRANSFERABLE QUOTAS UNDER THE MAGNUSON ACT, Hearing before the Subcommittee on Merchant Marine and Fisheries, House of Representatives, February

9, 1994, Serial No. 103-82, pp. 160-238. It contains a synopsis of scientific, academic and descriptive papers comparing hook-and-line gear to trawl gear.

The Council responded by dividing the annual BSAI cod Total Allowable Catch (TAC), 44% to fixed gear (hook-and-line and pots), 54% to trawl gear, and 2% to jig gear. Fixed gear representatives also convinced the Council to require by regulation that all halibut caught in the hook-and-line fishery for cod be carefully released - by shaking, cutting the gangion, or hook straightening.

This program was in place for the 1994 season. It was assumed that the mortality rate of halibut bycatch in the hook-and-line fishery would be 12.5%. This was an estimate which had not been substantiated in practice. Trawl halibut mortality was assumed to be 64%, based on observer data. The hook-and-line industry expected that NMFS would monitor mortality rates in-season, giving notice if rates exceeded 12.5%. It was also expected that NMFS observers would notify captains and crew if they saw halibut being killed or wounded, or if careful release was not being practiced. In the event neither communication came about, and only when the season was nearly over did the IPHC inform the longline industry that its mortality rate for 1994 was 18%.

In response to this information the hook-and-line fishermen organized an industry halibut bycatch mortality monitoring program with Fisheries Information Services of Juneau, AK (FIS) for the 1995 season. Each week the vessels FAX raw observer data on the physical condition of halibut bycatch to FIS. FIS calculates the halibut mortality for each vessel and FAXes it back promptly and confidentially. In this way a captain learns immediately if he is fishing in a high-bycatch area, or if his crew is mishandling the halibut.

The program has been remarkably successful. Two thirds of the fleet participated, and on June 1, 1995, the IPHC published an analysis entitled HALIBUT DISCARD MORTALITY RATES IN THE 1995 BSAI PACIFIC COD HOOK-&-LINE FISHERY: RESULTS FROM INSEASON DATA ANALYSIS. This study - which was rigorously conducted - determined that the halibut discard mortality rate during the first five months of 1995 was 11.5 % - a 36% reduction from the 18% calculated for 1994. Observer data also indicated that the primary cause of mortality in longline halibut bycatch is sand flea predation - vessels using swivel gear had lower discard mortality rates, probably because the gear provides the halibut more mobility. The Council recommended that the assumed halibut mortality rate for hook-and-line halibut bycatch be lowered to 11.5%, and that cumulative halibut mortality for the season be recalculated. With full participation by the fleet, we hope to do better. By comparison trawl halibut bycatch mortality rates for 1994 and 1995 were 64% and 65%, respectively.

Potential Halibut Savings

Rocket science is not required to determine that the Total Allowable Catch (TAC) for Pacific cod in the BSAI area could be taken entirely by fixed gear with a considerable savings of halibut - as the 1981 study predicted. Through 5/27/95, hook-and-line operators harvested and retained 71,777 mt of groundfish in their directed BSAI fishery for cod, using 417 mt of halibut mortality. At that same rate, they could harvest the entire TAC available to directed fishing (250,000 mt TAC less 35,000 mt trawl bycatch = 215,000 mt) with 1,249 mt of halibut mortality. As things stand in 1995, the cod will be harvested by a mix of fixed and trawl gear, using 2,275 mt of halibut PSC (1,550 mt trawl PSC cap plus 725 mt longline PSC cap = 2,275 mt). Subtracting the mortality of a longline-only fishery from that of the current mixed-gear fishery, we see that more than 1,000 mt of halibut could be saved if the directed fishery were prosecuted with longline gear only (2,275 - 1,249 = 1,026). There would also be considerable savings of pollock, cod, crab and other species. (Please see NMFS pie charts)

Proposed Plan Amendment

Former Council member John Winther and the Kodiak Longline Vessel Owner's Association, joined by a number of other fixed gear groups, have proposed an amendment to the BSAI Groundfish FMP which includes two options to make the BSAI directed fishery for cod a fixed gear fishery. Provision would be made for cod bycatch in other trawl fisheries. One alternative would accomplish this purpose immediately, the other involves a three year phase-in period. Fixed gear would include hook-and-line gear, and pots. Halibut bycatch in pots is so low that pots have been exempted from halibut PSC limits. If pots take part of the cod quota, halibut savings will be even greater. The proposals would also require full catch retention in the fishery, except for skates and sculpins.

It is interesting to consider the value of such savings, and what might be done with them. IFQ halibut shares are selling for \$6 to \$9 per pound, depending on the area in which the fish can be taken. Using an average of \$7.50 per pound, we can calculate that 1,026 mt of halibut saved and harvested in the ITQ fishery should be worth some \$17,000,000 ($1,026 \times 2,200 \times \$7.50 = \$16,929,000$). Halibut saved from the trawl cod fishery could be used in other trawl fisheries, enhancing their value. Finally halibut saved could be apportioned to the hook-and-line fishery as a reward to encourage clean fishing.

Conclusion

The theory proposed by the Council Work Group - that prohibited species bycatch in the BSAI groundfish fisheries could be greatly reduced if hook-and-line gear rather than trawl gear were used in bottom fisheries - has been proved in practice.

While longline fishermen have halibut bycatch in the BSAI fishery for cod, they are able to reduce associated mortality significantly through careful release and industry bycatch monitoring. This latter program functions without any federal regulation or expense, and it is hoped that performance will further improve with the whole fleet involved. At least 1,000 mt of halibut PSC could be saved annually if the BSAI directed cod fishery were prosecuted with fixed gear only. Bycatch and discard of other species would be reduced significantly. No complex and expensive regulation would be required. No additional investment in vessels or gear would be required. Clean fishing would be encouraged and rewarded without creating problems of proof and due process. Halibut bycatch in the directed fishery for cod is the most solvable bycatch problem in the BSAI today.

References

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- National Marine Fisheries Service, Alaska Region. 1993-1995. NMFS Fisheries Management Reports. Graphics.
- Wespestad, Hoag and Narita. 1982. Reducing the Incidental Catch of Prohibited Species in the Bering Sea Through Gear Restrictions. International Pacific Halibut Commission Technical Report No. 19: 5-14.
- Williams and Sadorus. 1995. Halibut Discard Mortality Rates in the 1995 BSAI Pacific Cod Hook-&-Line Fishery: Results From Inseason Data Analysis. International Pacific Halibut Commission.
- Witherell and Harrington. 1995. DRAFT Appendix D, Prohibited Species Catch in the Bering Sea/Aleutian Islands Area. Fishery Management Plan for the Groundfish of the Bering Sea/Aleutian Islands Area.

Table 1

**1995 BSAI Trawl Fisheries PSC
Apportionments and Seasonal Allowances**

Fishery Group	Assumed Mortality ¹	Halibut Mortality Cap (mt)	Herring (mt)	Red King Crab (animals) Zone1	C. bairdi Zone1	C. bairdi Zone2
Yellowfin sole January 20 - August 2 August 3 - December 31	70%	750 280 470	315	50,000 35,000 15,000	225,000	1,525,000
Rocksole/other flatfish January 20-March 29 March 30 - June 28 June 29-December 31	70%	690 428 180 82		110,000	475,000	510,000
Turbot/sablefish/ Arrowtooth	40%	120				5,000
Rockfish Jan. 1 - Mar. 29 Mar. 30 - June 28 June 29 - Dec. 31	60%	110 30 60 20	8			10,000
Pacific cod January 20-October 24 Oct. 25-December 31	60%	1,550 1,450 100	24	10,000	225,000	260,000
Pollockmackerel/o.species January 20-April 15 April 16- December 31	60%	555 455 100	169	30,000	75,000	690,000
# MW Pollock (Herring)	80%		1346			
TOTAL		3,775	1,861	200,000	1,000,000	3,000,000

¹ Mortality rates of halibut based on rates used in 1994, subject to re-evaluation and revision in June.

Council Recommended 1995 BSAI Non-Trawl Fisheries PSC Bycatch Allowances

Fishery Group	Assumed Mortality*	Halibut Mortality (mt)	Seasonal Apportion (mt)
Pacific Cod Jan 1 - April 30 May 1 - August 31 Sept. 1 - Dec. 31	12.5%	725	475 40 210
Other Non-Trawl**	12.5%/15%	175	
Groundfish Pot	5%	Exempt	
TOTAL		900 mt	

* Mortality rates based on rates used in 1994, subject to re-evaluation and revision in June.

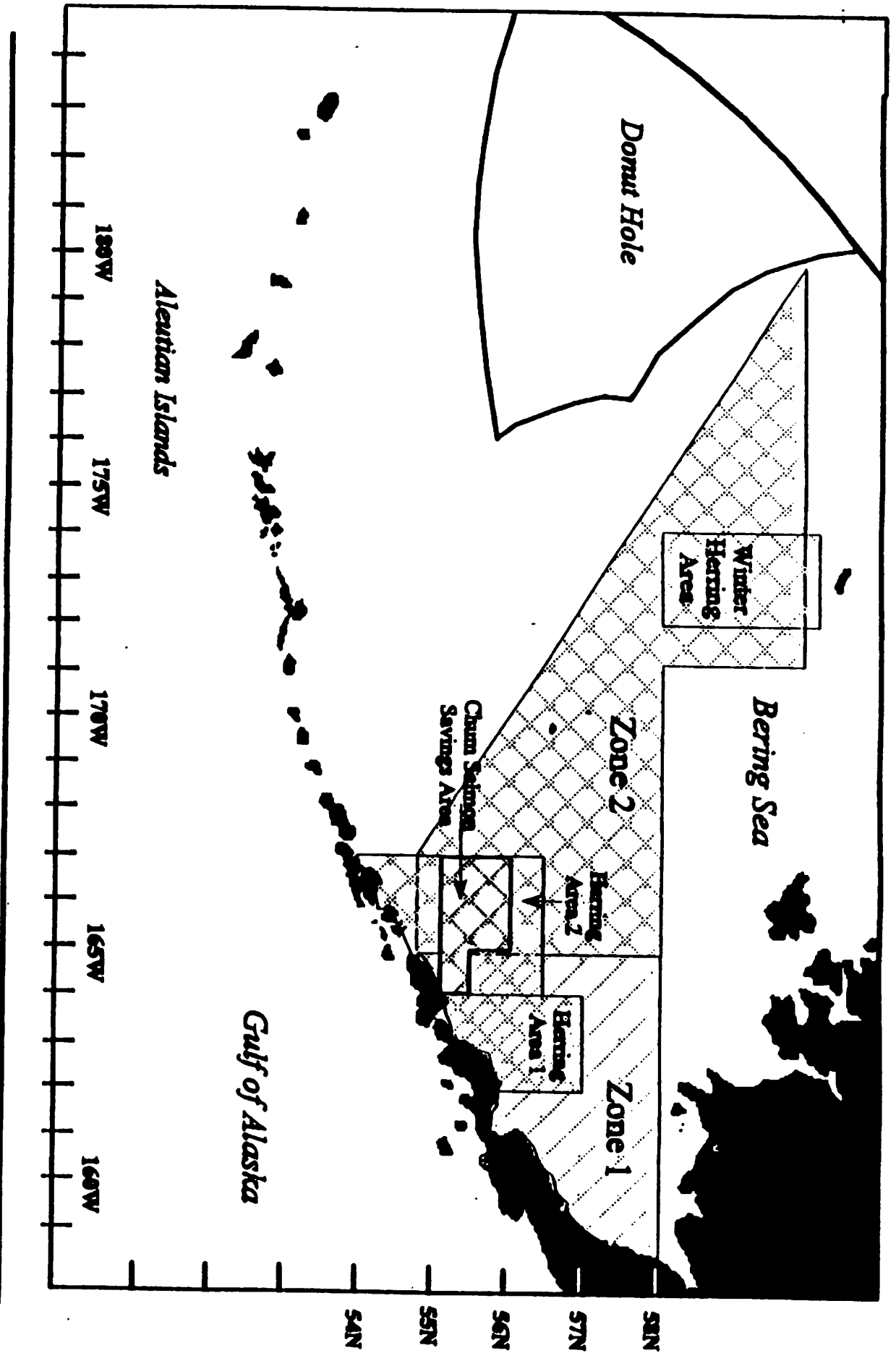
** Includes hook & line fisheries for rockfish and Greenland turbot.

Sablefish hook & line fisheries will be exempted from the halibut mortality cap.

Jig gear will also be exempted from the halibut mortality cap.

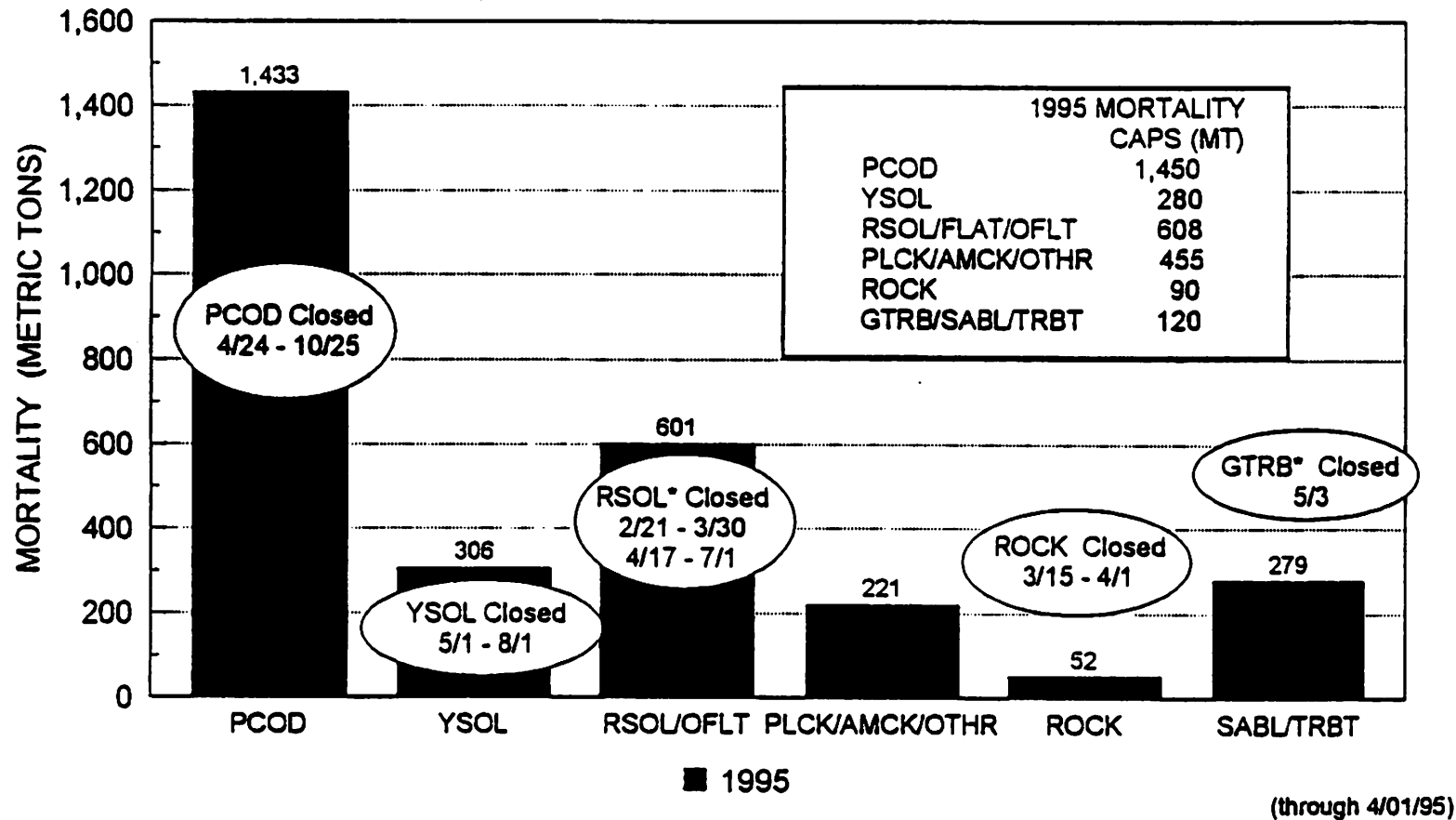
Figure 1 Prohibited Species Bycatch Closure Areas

Source: NMFS



1995 BSAI HALIBUT BYCATCH MORTALITY, TRAWL

Source: NMFS



*Closures shown are due to halibut bycatch

1993 BSAI TRAWL GROUNDFISH DISCARD, PCOD FISHERY

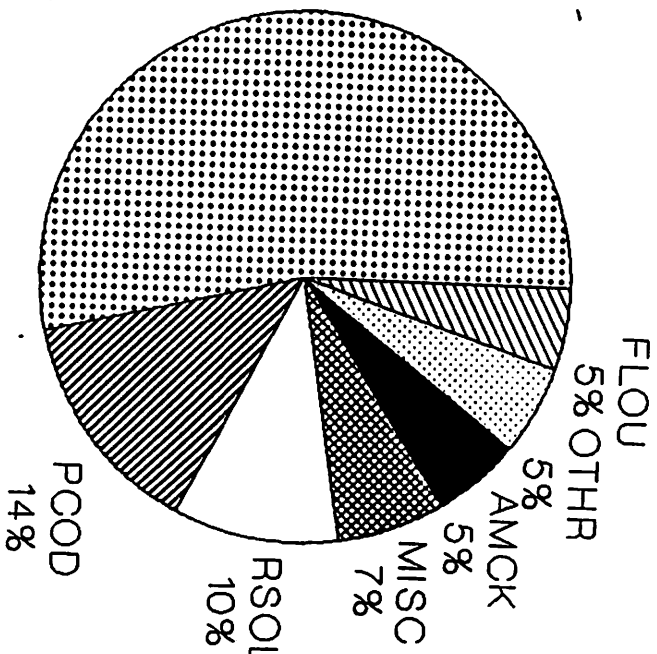
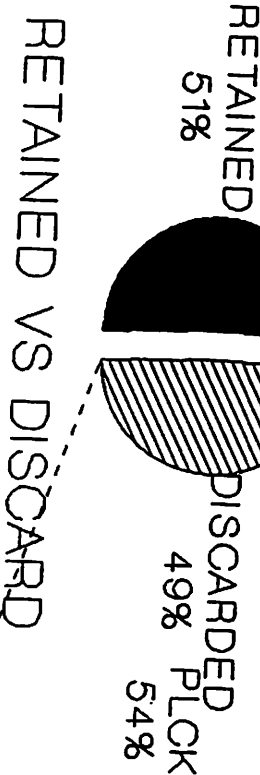
Source: NMFS

AMOUNT (MT)

RETAINED	51,995
DISCARDED	50,811

DISCARD

AMCK	2,760
FLOU	2,520
MISC	3,314
OTHR	2,746
PCOD	7,006
PLCK	27,294
RSOL	5,171



TOTAL GROUNDFISH DISCARD
IN PCOD FISHERY

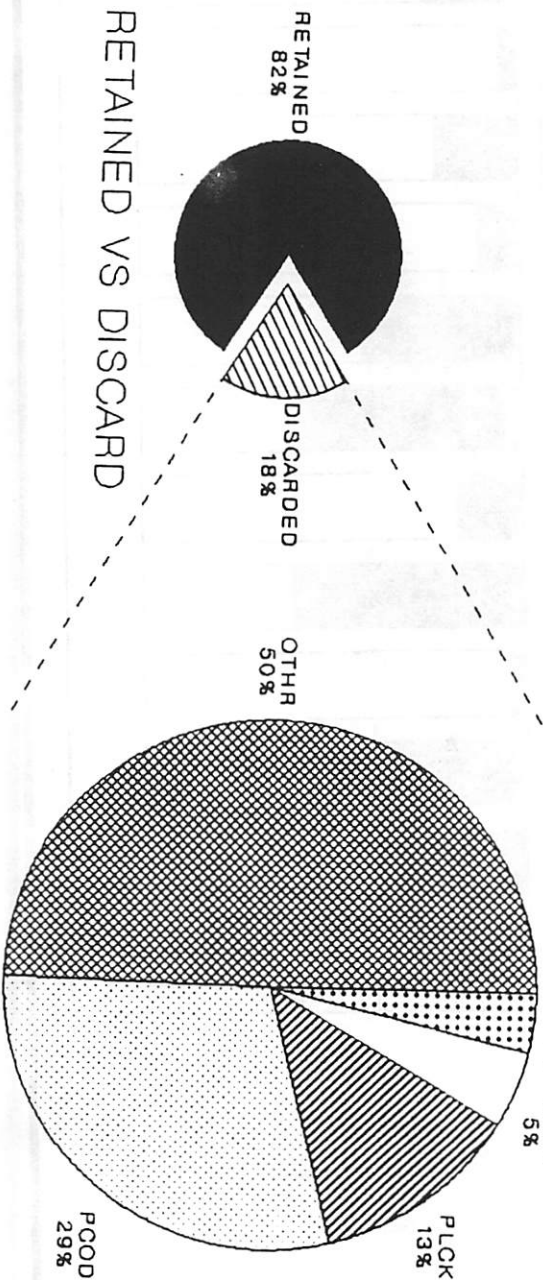
1993 BSAI H&L GROUND FISH DISCARD, PCOD FISHERY

Source: NMFS

AMOUNT (MT)

RETAINED	63,145
DISCARDED	14,166

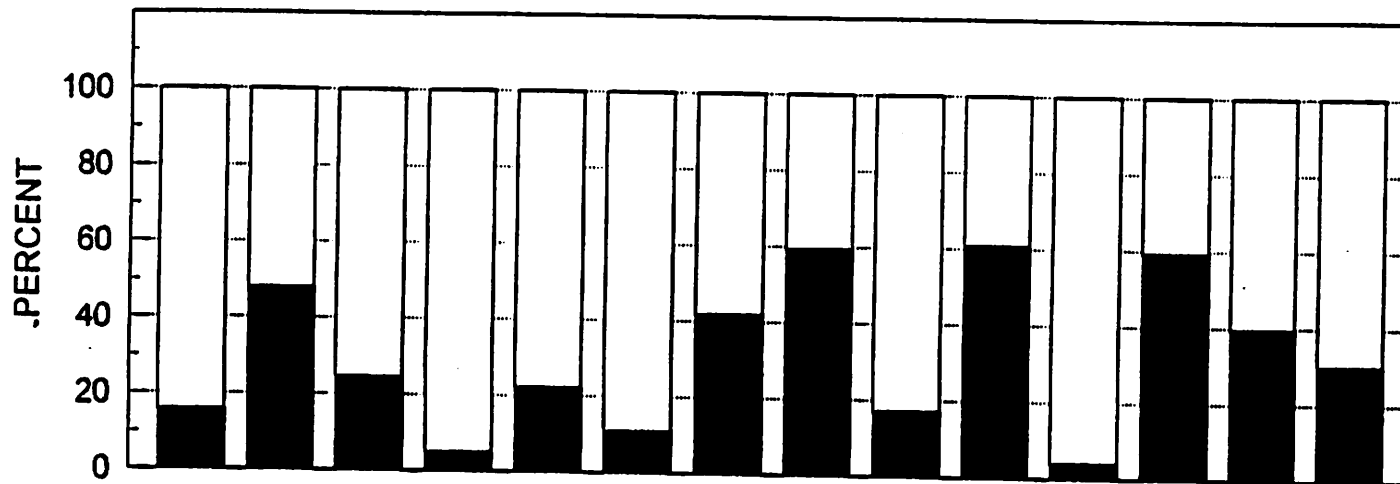
ARTH	661
MISC	514
OTHR	7,037
PCOD	4,145
PLCK	1,809



(through 9/04/93)

1995 BSAI PERCENT DISCARDS BY GEAR & TARGET FISHERY

Source: NMFS



	C-HAL	S-HAL	T-HAL	C-POT	A-TRW	B-TRW	C-TRW	F-TRW	K-TRW	L-TRW	P-TRW	R-TRW	T-TRW	Y-TRW
DISCARDED ■	13,333	355	735	832	18,915	9,982	48,812	1,432	2,084	2,121	21,633	25,545	2,320	24,190
RETAINED □	71,777	387	2,250	12,695	68,760	81,528	65,167	977	10,014	1,388	525,709	17,628	3,560	58,157

LEGEND	A - Atka mackerel	P - Midwater pollock
	B - Bottom pollock	R - Rock sole
	C - Pacific cod	S - Sablefish
	F - "Other" flatfish	T - Greenland turbot
	K - Rockfish	Y - Yellowfin sole
	L - Flathead sole	

(through 5/27/95)

Rocket Science - Halibut PSC Savings

250,000 mt - 1995 BSAI Cod TAC
35,000 mt - Trawl Bycatch
215,000 mt - Directed Fishery

417 mt - Fixed Gear Halibut Mortality to 5/29/95
71,777 mt - BSAI Fixed Gear Cod Catch to 5/29/95

$\frac{417}{71,777} = \frac{X}{215,000}$ X = 1,249 mt Halibut PSC for
Fixed Gear Fishery Harvest

1,550 mt - Trawl Halibut PSC Cap
725 mt - Fixed Gear Halibut PSC Cap
2,275 mt - Total Halibut PSC Cap, 1995

2,275 mt - Total Halibut PSC Cap
1,249 mt - Fixed Gear PSC Requirement
1,026 mt - Halibut PSC Savings

(Source: FIS)

NORTH PACIFIC FIXED GEAR COALITION

June 3, 1991

Mr. Larry Cotter, Chairman
Ad Hoc Bycatch Committee
North Pacific Fishery Management Council
605 West 4th Avenue
Anchorage, AK 99501

RE: Preferential Fixed Gear Access to Demersal Groundfish Species

Dear Larry:

Recent trawl bycatches of herring, salmon and halibut in the Bering Sea and Gulf of Alaska have re-emphasized the urgent need for effective prohibited species bycatch controls in the groundfish fishery. This circumstance is very much like that which in 1980 caused Nunam Kitlutsisti to file an action in the U.S. District Court of Alaska challenging the adequacy of federal regulations addressing BSAI prohibited species bycatch (please see Literature Referenced, #1, attached). Today we have grave concerns about trawl bycatch being voiced not only by fishermen, sports fishermen, rural Alaskans and environmentalists, but also by the Canadians. Despite the diligence of your committee and the creation of a dizzying maze of regulations, real progress on bycatch issues has been limited.

It would appear that we are repeating history in this regard. Having failed to apply preventive medicine ten years ago, we are now faced with the prospect of major surgery - and we seem to have some difficulty mustering the courage. It is time to readdress the problem and to take appropriate action during the 1992 bycatch amendment cycle.

In response to the situation in 1980, the Ad Hoc Working Group on Prohibited Species and the SSC produced Council Document #13, a collection of scientific papers describing the PSC bycatch problems and suggesting solutions. The ninth paper, "Methods of Reducing the Incidental Catch of Prohibited Species in the Bering Sea Groundfish Fishery Through Gear Restrictions", hit the nail on the head. (#1) It observed that the incidental catch of prohibited species is much less with longlines or off-bottom trawls (truly pelagic trawls which do not touch the bottom) than with on-bottom trawls, and recommended consideration of two management alternatives involving gear restrictions:

(1) prohibit on-bottom trawls in all areas, i.e., groundfish will be harvested only with longlines and off-bottom trawls; and (2) on-bottom trawl gear will be allowed only in areas defined as yellowfin sole or turbot grounds.

Analysis revealed that the estimated savings of prohibited species would be dramatic. Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%, Tanner crab and king crab catches by 99%, and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species, but the reductions were less than for alternative (1). For both conservation and economic reasons it would have been best if fixed gear had been prescribed as the only allowable gear for certain demersal groundfish fisheries, a decade ago.

The North Pacific Fixed Gear Coalition now respectfully requests that the Ad Hoc Bycatch Committee recommend analysis of a fixed gear preference for demersal groundfish species in the BSAI, as part of the 1992 bycatch amendment.

Please consider the reasoning which supports this request:

I. Reduction in Prohibited Species Mortality

Substantial PSC bycatch savings could be realized if fixed gear were employed exclusively in the BSAI fisheries for Pacific cod, sablefish and turbot. (#1) Mortality inflicted on halibut by hook-and line gear is calculated by the IPHC at 16% of the bycatch, while trawl-inflicted mortality may be as high as 100% (there is some dispute over this latter figure, and a somewhat lower number may be justified - halibut mortality on shoreside delivery trawlers is calculated at 50%; Fisheries Information Services [FIS] has used a compromise figure of 85% for overall trawl mortality in the attached report). Longliners are working with the IPHC to further reduce their halibut bycatch mortality.

In the 1990 longline fishery for cod in the BSAI, halibut mortality per ton of cod was 5.8 kg. The halibut mortality in the 1990 BSAI trawl fishery for cod was 27.8 kg per ton of cod. The trawl fishery mortality was 4.8 times that of the longline fishery, by weight. During the first four months of 1991, the longline rate was 2.5 kg of halibut killed per ton of cod. The trawl rate was 21.9 kg per ton of cod. The trawl mortality was 8.8 times that of the longline fishery, by weight. (FIS)

It is estimated that 1,624 mt of halibut could have been saved in 1990 if the entire TAC for BSAI cod had been taken by longline gear. For the first four months of 1991, 1,374 mt could have been saved had the catch been taken with

longline gear. By contrast, if the entire 1990 BSAI cod TAC had been taken by trawlers (assuming no PSC caps), 6,299 mt of halibut would have been lost. (Mortality figures, FIS)

Additionally, bycatch of at least 15,000 king and more than 1.5 million Tanner crab would have been avoided in 1990 if longline gear had been used exclusively in the BSAI cod fishery. (FIS)

Beyond these considerable savings, it is noteworthy that longline bycatch of salmon and herring is insignificant.

Please see attached report from Fisheries Information Services for additional information.

II. Achieving Optimum Yield

In 1990 some 60,000 mt of BSAI cod were left unharvested because of trawl closures due to PSC bycatch caps. (FIS)

Had enough fixed gear been deployed in the fishery, OY could have been achieved easily within the bycatch limits.

III. Reduction in Discards

Trawl catches often include fish of the target species which are too small or too large to be processed, or which are severely damaged. These catches also include non-target species which may be targeted by other fisheries, or species which are not conveniently marketable. These fish are often discarded at sea. The trawl discard problem can be a very substantial one, especially when added to the discard of valuable prohibited species. (#3,5,6,7,10; also see FIS Report) Some researchers report that trawl discards are unavoidable, and that little can be done technically to decrease the amounts of discards. (#6) The recent failure of "pelagic" trawls in the BSAI cod fishery supports this contention. (#9)

Longline fisheries are size and species selective, and have few bycatch problems requiring the discard of fish. (#1,2,3,4,5,6,7) Virtually all of the cod caught in the directed BSAI longline fishery are utilized. Skate wings and rock fish are retained and marketed. Very little is thrown back. Bycatch in the fishery is said by NMFS to be 5% of the total catch (See FIS report).

Considerable savings of discards can be achieved through the use of fixed gear.

IV. Conservation-Oriented Fishing

"Today there is agreement among fisheries scientists that fishing has a significant impact on the dynamics of fish populations. Mobile and passive fishing gears have different abilities to fish selectively for fish of particular size and species. Proper management of fish stocks should therefore not be based only on recommendations on total catch quotas, but also on how the quotas are taken." (Bjordal and Laevastu, # 2 below, emphasis added) Selection of an optimal fishing regime requires that the conservation aspects of different gear types be taken into consideration:

A. Size Selectivity - Longline gear is size-selective; large hooks and large pieces of bait catch large fish. (#2,3,4,5,6,7,8) Bjordal and Laevastu estimate that if longlines, rather than trawls, were used to harvest a given quota of cod in the BSAI, a greater biomass would remain in the sea; that at a given stock level, higher annual catches can be taken with longlines than with trawls; and that removal of older cod benefits recruitment by reducing cannibalism. (#2) Large cod are also an important predator of commercially valuable crabs. (#6)

Compared with longline gear, trawl gear is a much more powerful tool for catching small fish. Codend selection is most important for small fish, but clogging of meshes or large catches that stretch (close) the meshes are factors that give very poor selection properties. (#2,3,6,7)

B. Species Selectivity - Longlines have good species-selective properties, and non-commercial bycatch is normally modest. (#3,4)

A trawl will in principle catch all fish in the swept volume, except those that are selected through the meshes. Large bycatches of different non-commercial species are therefore not uncommon in trawling. (#3,6)

C. Product Quality - Line caught fish are usually of much higher quality and command higher prices than net-caught ones. (#4) While both gear types may produce fish of high quality, big trawl hauls and hauls of long duration may lead to reduced quality because the fish are exposed to high pressure in the codend, and because it may take too long before parts of the catch are processed. (#3)

D. Negative Effects on the Environment - Longline gear does not have destructive effects on bottom topography or fauna. Trawl gear may have a severe impact on the bottom environment. (#3)

E. Energy Conservation - Compared with trawling, longlining is regarded as a low energy fishing method. (#3) It appears that gear which requires little energy, such as longline gear, is being used increasingly in preference to active gear. (#4)

F. Fishing on Spawning Stocks - Canadian authorities are sufficiently concerned about intense trawling on spawning cod stocks and uncertainties about the effect of such activity on mating behavior, spawning success and possible localized depletion that they have prohibited directed fishing for northern cod during the peak spawning season. (#8) Similar concerns are expressed with regard to BSAI pollock in the preamble to the rule which seasonally apportions pollock TAC in the BSAI, and in the preamble to the 1991 BSAI TAC specifications. A cautionary note with regard to fishing on spawning cod stocks is contained in the DRAFT SEIS for Amendment 18/23.

Trawlers can and do conduct intense fisheries on spawning stocks. Only PSC caps have prevented them from harvesting the entire BSAI cod TAC in a short pulse fishery. By contrast, the longline fishery for cod is prosecuted slowly over the year, averaging less than 1,000 mt per week in the BSAI during 1990. Unlike trawl gear, longline gear is limited absolutely in its daily catch level by the number of hooks it can deploy. (#5) A longliners cannot accelerate its harvest during the spawning period.

From a conservation perspective, longlining is clearly preferable to trawling for the harvest of demersal species like cod.

V. Market Implications

Because line-caught fish are generally of the highest quality, they generally command the highest prices. (#3,4) The Council has heard repeated testimony to the effect that the market wants a steady supply of fresh fish throughout the year - most recently at the April Council meeting. The BSAI longline fishery for cod is conducted slowly, providing that supply.

Maximization of returns from the resource and market demands indicate that longlining is the best method for harvesting cod in the BSAI.

VI. Data Gathering

Estimating the catch of distant water factory trawlers and mothership fleets is difficult and subject to several sources of error. The weight of groundfish catches in the BSAI is not obtained from scales, but by visual assessment of the cod end or some other indirect method. If limits on

the catch are not rigorously monitored and enforced, inaccurate reports of catch (including discards) may result. In addition to the underlogging of catches, undersized or undesirable species (in addition to prohibited species) may be discarded to maximize catches under a mix of species quotas. Further, verification of catches by onboard observers is complicated by several factors such as the size of factory ships and fishing vessels, the size of catch and the rapidity of processing. Under these conditions estimates of catches are uncertain and their verification difficult. (#6)

Longline vessels catch their fish one at a time, landing them at a single location on the vessel. Observation and data gathering are a relatively simple process.

It is far easier to gather catch, discard, and prohibited species bycatch data on longliners than on trawlers.

VII. Costs of Management and Enforcement

The deployment of trawl fleets with massive fishing power requires intense regulation to protect prohibited species, prevent overfishing, prevent conflict with other fisheries. (#6) "Overmanagement" rather than "overfishing" has become a concern in some regions, such as the eastern Bering Sea and the Gulf of Alaska. (#6) In the BSAI groundfish fishery we now have zones, zones within zones, primary and secondary closures, caps, fishery-apportioned caps, seasonally apportioned caps, seasons, incentive programs, etc., aimed primarily at controlling trawl effort. These are in addition to observers and elaborate reporting requirements. The system requires development, implementation, administration and enforcement of complex regulations. It is so complicated it sometimes baffles those responsible for inseason management. Trawl companies must now hire specialists to keep their vessels in compliance with these ever-changing rules. All of this is very expensive - to the taxpayer and to the fisherman. (#7)

The other problem with this band-aid approach is that it doesn't work - witness the recent PSC bycatch problems in both the BSAI and GOA, the continuing early closures of directed fisheries. But there is an alternative.

Several authors, having studied the subject thoroughly, have suggested that longline fisheries for groundfish can be prosecuted without micromanagement and its attendant frustrations and expenses. (#1,5,7) BSAI longlining is species-specific, and prohibited species mortality is de minimus. Other discards are minimal. The harvest is slow, and there is no danger of overfishing due to accelerated

harvest capacity. The size (and age) of the directed catch can be controlled very simply by regulating the size of the hooks employed, if such control is found necessary. In the BSAI longline fishery there is no realistic need for 100% observer coverage. One author states that in the cod fishery off Nova Scotia, "The longliner fleet could be left essentially unregulated since it is not economical for it to overfish the stock." (#5) Another states, "Longliners can be managed by hook size only; the hook size should make it probable that the fish will spawn at least twice prior to capture." (#7) Bjordal and Laevastu observe, "The study recommended restrictions on bottom trawling to reduce PSC bycatch problems, while similar restrictions were not found necessary for longlines and off-bottom trawling." (#2,1)

The hypermanagement and associated costs necessitated by excessive trawl effort can be substantially avoided in certain of the demersal groundfish fisheries by the use of fixed gear.

VIII. Efficiency

The notion that trawling is somehow the most "efficient" method of harvesting all demersal species lies at the heart of our contemporary management difficulties. Certainly trawl technology is appropriate for the harvest of yellowfin sole and perhaps certain other bottom species, so long as bycatch problems are controlled. Beyond that, the employment of passive gear should be encouraged.

The key to this analysis is the "hidden" costs of bottom trawling, the real biological and social costs or "externalities" which are shifted from the trawl industry to society under our current management system. Peter Matthews states the general case dramatically:

"Ladies and gentlemen, the list goes on and on! The problem is not confined to Atlantic Canada; it is a world-wide problem. Every country which has a major trawling industry has similar problems and costs. In Atlantic Canada, the hidden costs of operating trawlers probably add billions of dollars a decade to the fishing industry's bill to the nation's tax payers. For example, I am convinced that if these costs were accurately measured and allocated, the true cost of landing a pound of fish with that 90' combination trawler/seiner would be significantly higher than to land a pound with the 99' steel longliner. To my knowledge, however, these costs have never been studied in anything more than the most superficial way. The time has come to do so. All of us, politicians, bureaucrats, industry leaders, both in the companies and those representing fishermen, have all been guilty of the cardinal sin of: 'Not being able to see the wood for the trees'. There might have been a few lone voices out there, trying to

highlight the problems with trawler technology, but they have been pushed to one side by the majority, myself included, who had only one desire and that was to catch more fish, 'economically'."

"This has been particularly true since the introduction of the diesel engine to the trawler fleets of the world; for convenience let's say since the end of World War Two. In 1946, the oceans were teeming with fish. The supply was apparently endless and populations needed to be fed. The trawler was cheap to build, efficient, and nobody was really concerned about conservation or, if they even thought about it, it was someone else's problem. Most of us got caught up in the process of technological innovation, which dazzled us and made the trawler ever more efficient and ever more destructive with the result that, gradually over the past forty years, one fishery after another has collapsed. This has led to an endless cycle of crises in world fisheries followed by regulations designed to improve the local situation but which never did, such as fishery closures or cut backs to allow stocks to recover, so that we could start the cycle all over again. We must all have been mad! The fact of the matter is that, on a world wide basis, we were blind and never really stopped to look at the whole problem...environmental costs must be factored into the equation if the true costs of catching fish are to be determined." (#7)

Technically, the mechanical effectiveness of longline fishing has been significantly increased over the last fifteen years. This has been achieved by increased effort through mechanized baiting and gear handling, and by improved catching performance of the gear. (#3) More important, longliners in the BSAI are highly efficient from a conservation perspective. (#3) PSC bycatch mortality and waste are minimal. Elaborate regulation and enforcement are unnecessary. (#1,5,7) Considerable savings can be realized through the rational employment of longline effort.

If bottom trawl operations were obliged to internalize their true biological, environmental, regulatory, enforcement and social costs - which are now shifted to society - they would not look so "efficient". They are in fact being heavily subsidized by other fishermen, by the American taxpayer, and by consumers.

Mr. Matthews concludes: "There must be a significant phasing out of offshore trawlers, to be replaced by offshore longliners." (#7)

IX. Fairness and Equity

"The complex problems of 'fairness' and 'equity'...have two basic criteria connected with them -- need and

responsibility." (#6) The need pertains to the fishermen, including jobs, potential for profits, and supply of protein. The overriding responsibility is for protecting and conserving the public resources which produce those benefits.

Where different gear types have dramatically different conservation implications for the variety of species found within a complex, the manager's job in determining which gear type should be utilized is relatively simple. The responsibility for conservation must to a degree override the need for jobs and profits. In this case, fixed gear should be given preference over mobile gear in the harvest of certain demersal groundfish species. "Fairness toward the ecosystem" should prevail.

In order to put things in perspective, assume that the entire 1991 BSAI TAC's for Pacific cod, turbot, and sablefish were reserved for exclusive harvest by fixed gear (provision would have to be made for bycatches in other fisheries, of course). The combined tonnage would be 241,200 mt - only 12% of the tonnage available (though a greater proportion of the total value). The trawl fleet would still have 88% of the tonnage for its exclusive use.

Considerations of fairness and equity should not prevent preferential treatment for fixed gear in the harvest of demersal species.

X. Conclusion

Progress in the control of prohibited species bycatch in the BSAI trawl fishery has been limited over the last decade. Despite the development of a highly complex regulatory structure to prevent the interception of prohibited species, crises continue unabated.

In 1981 Council Document #13 suggested that groundfish might be harvested only with longlines and truly pelagic off-bottom trawls in the BSAI, with possible exceptions for yellowfin sole and turbot. (1) The supporting analysis suggested that prohibited species savings would be dramatic. This policy was not adopted to guide development of the nascent DAP groundfish fishery, with the result that considerable resources were invested - or perhaps misinvested - in bottom trawl technology. Society is now paying the price in the many ways outlined above. Crisis follows upon crisis, with no effective response. It is time to take action. **Fixed gear should be given preferential access to demersal species wherever practical.**

Prohibited species problems are only the tip of the iceberg, however. Please consider the following:

1. TAC for BSAI Pacific cod could be achieved by fixed gear without exceeding PSC limitations;

2. Considerable savings of other discards could be achieved through the use of fixed gear;

3. From a conservation perspective - size selectivity, species selectivity, product quality, environmental impacts, energy conservation, fishing on spawning stocks - longlining is clearly preferable to trawling for the harvest of demersal species like cod;

4. Line-caught fish are generally of the highest quality, and generally command the highest prices. Markets demand a steady supply of high quality product throughout the year. While trawlers often thrive on pulse fisheries concentrated on spawning stocks, longliners in the BSAI harvest slowly throughout the year, over the full geographic range of the stocks;

5. There is some uncertainty as to the accuracy of trawl catch data - total catch, prohibited species catch, discards. Data gathering on longline operations is not so difficult;

6. The micromanagement made necessary by the massive trawl fleet places great economic burdens on government, industry, and the public. Micromanagement is unnecessary for longlining operations;

7. Trawl operations externalize the true biological, regulatory, enforcement and social costs of their fishery, which are borne by other fishermen, the American taxpayer, and consumers. If these costs are factored in, trawl operations appear considerably less "efficient" in the economic sense. The mechanical effectiveness of longline fishing has been significantly increased over the last fifteen years. Longline operations are very "efficient" in the broader context; and

8. The overriding duty of fishery managers is to protect and conserve the fishery resources which produce jobs, food, and profits. Where one gear type has substantial conservation advantages over another, questions of "fairness and equity" should not stand in the way of preferential treatment for the conservation-oriented gear. "Fairness to the ecosystem" should prevail.

The many problems posed by bottom trawling are not "an economic reality", nor are they "just a cost of doing business". They can be avoided.

For the above reasons the undersigned associations respectfully request that the Ad Hoc Bycatch Committee recommend to the Council that a fixed gear preference for demersal species in the BSAI groundfish fishery be analysed as part of the 1992 bycatch amendment.

An effective way to implement such a policy would be to assess the intention and ability of the domestic fixed gear industry to harvest demersal species each year, and to apportion TAC accordingly. This would allow a gradual implementation of the preferential policy, while ultimately maximizing its advantages.

Thank you for your attention.

Sincerely,

Kodiak Longline Vessel Owners' Association
Fishing Vessel Owners' Association
Petersburg Vessel Owners' Association
Freezer-Longliner Group

LITERATURE REFERENCED

A considerable body of scientific work comparing trawl gear to fixed gear has emerged over the last decade. These analyses address and support the contention that fixed gear is superior to trawl gear for the harvest of demersal fish like cod, especially if conservation issues are taken into account. Several of these studies are summarized and/or quoted below. Most are reproduced in material part at the similarly numbered appendices.

It should be noted that only two of these studies directly address the Pacific cod fishery in the BSAI region - and that the first reflects conditions ten years ago, when foreign harvesting and processing elements were present. The others are general works reflecting experience in groundfish fisheries around the world, or are more specific to cod fishery experience in particular countries such as Canada and Norway. Stock status and exploitation strategies vary. No claim is made here that these studies are definitive for conditions now prevailing in the BSAI cod fishery. Rather they are presented to offer insights into the nature of longline and trawl fisheries for cod, the issues which differentiate them, and the patterns which may emerge if conservative cod fishery management is not employed in the BSAI.

1. REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES BY FOREIGN GROUND FISH FISHERIES IN THE BERING SEA, NPFMC Council Document #13, April, 1981.

The development of Council Document #13 was hastened by the occurrence of events a decade ago which parallel remarkably the events of the last few months. The BSAI and GOA groundfish plan teams were preparing a brief entitled "Controlling the Incidental Catch of Prohibited Species", which addressed in general terms a variety of management options to control incidental catches of PSC species in the foreign-dominated groundfish fisheries. Simultaneously information was released from the Northwest and Alaska Fisheries Center which showed that the incidental catch of salmon by foreign trawlers in the BSAI had increased several-fold in 1979. Alarmed by prospects that the incidental taking of salmon and herring by foreign trawlers might adversely affect the native populations of western Alaska, a native organization called Nunam Kitlutsisti petitioned the Council to close the better part of the Bering Sea to foreign fishing October 1 through March 31 each year. When the petition was denied, Nunam Kitlutsisti and 25 other plaintiffs brought an action in the U.S. District Court of Alaska to challenge the adequacy of regulations addressing prohibited species bycatch.

Thus stimulated, the Council's Scientific and Statistical committee directed that a working group be formed to investigate in greater depth alternative approaches for reducing the catch of prohibited species in the Bering Sea groundfish fisheries. Council Document # 13, a series of scientific papers, was the result.

REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES IN THE BERING SEA GROUND FISH FISHERY THROUGH GEAR RESTRICTIONS, by Wespestad, Hoag, and Narita, reprinted as IPHC Technical Report No. 19, 1982, was one of the papers.

This report observes that the incidental catch of prohibited species is much less with longlines or off-bottom trawls than with on-bottom trawls. It examines two management alternatives involving gear restrictions: (1) prohibit on-bottom trawls in all areas, i.e., groundfish will be harvested only with longlines and off-bottom trawls; and (2) on-bottom trawl gear will be allowed only in areas defined as yellowfin sole or turbot grounds.

Trawl tests led to the conclusion that pollock can be fully harvested with off-bottom trawls. Squid, Atka mackerel, and rockfish can be partially harvested with off-bottom trawls. Pacific cod, sablefish and large flounders (primarily turbot) can be effectively taken with longline gear. Yellowfin sole and flounders could not be harvested with either off-bottom trawls or longlines. To harvest these species would require allowing on-bottom trawls in at least limited areas or time periods as suggested in Alternative (2).

Estimated savings of prohibited species were dramatic. Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%, Tanner crab catches and king crab catches by 99%, and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species but the reductions were less than for Alternative (1). High incidental catches of halibut and crab were estimated for the on-bottom trawl fishery for turbot, and large catches of Tanner crab occurred in the yellowfin sole fishery.

The study recommended restrictions on bottom trawling to reduce PSC bycatch problems, while similar restrictions were not found necessary for longlines and off-bottom trawling. **Had this policy been adopted in 1981 as a guide for DAP fishery development, most of our current prohibited species bycatch problems would have been avoided.**

2. EFFECTS OF TRAWLING AND LONGLINING ON THE YIELD AND BIOMASS OF [BSAI] COD STOCKS - NUMERICALLY SIMULATED,
Bjordal and Laevastu, ICES Paper C.M. 1990/G:32 Ref. B.

Increased fishing effort and improvement of fishing gear and methods have during the last 30 years coincided with a considerable decrease of major fish stocks despite a rising number of regulations to manage the fish resources. Today there is agreement among fisheries scientists that fishing has a significant impact on the dynamics of fish populations. Mobile and passive fishing gears have different abilities to fish selectively for fish of particular size and species. Proper management of fish stocks should therefore not be based only on recommendations on total catch quotas, but also on how the quotas are taken (i.e., what gear types should be used).

To determine an optimal catching regime (gear type and effort), the conservation aspects of the different gear types should be taken into account: species and size selectivity, discards, survival after escapement, fish quality, environmental aspects and energy conservation.

The results of this numerical study suggest that BSAI Pacific cod are recruited to the trawl fishery one year earlier than to the longline fishery. More prefishery juveniles are caught with trawls than with longlines, and consequently the amount of discards is higher from the trawl catch than from the longline catch. The study concludes:

a. The type of gear used in a fishery may have a marked effect on the dynamics of a fish stock - in this case it is predicted that if a given catch quota of cod is taken by longlines, a higher biomass will remain in the sea than if the same quota is fished with trawls. The difference in cod biomass (weight) remaining in the sea is even greater after four years of fishing with trawls versus longlines;

b. If a given stock level is desired, higher annual catches can be taken with longlines than with trawl gear;

c. Cod become more cannibalistic with increasing age. Since longline catches include more large fish, longlining is beneficial to recruitment to the extent the latter is controlled by predation; and

d. These results indicate that some longline fishing might be allowed to continue when TAC for trawlers has been reached.

3. RECENT DEVELOPMENTS IN LONGLINE FISHING -- CATCHING PERFORMANCE AND CONSERVATION ASPECTS, Bjordal, Institute of Fishery Technology Research, Bergen, Norway, 1988.

During the last fifteen years the effectiveness of longline fishing has been significantly increased. This is achieved both by increased effort through mechanized baiting and gear handling, and by improved catching performance of the gear.

The conservation aspects of longline gear are compared to those of trawl gear in the groundfish fishery off Norway.

a. Size Selectivity, Longline Gear - The longline is regarded as a size selective fishing gear, particularly if large hooks and large pieces of bait are used. Large fish will take large or small baits, while small fish will only take small baits. In the Arcto-Norwegian cod fishery, the trawl catches contained on average 19.4% small fish (less than 45 cm headed) compared with 6.1% for longline, clearly indicating that longline is a more conservation-oriented fishing method than trawling with respect to the exploitation of the younger fish groups. Note that discards were not included in these figures.

b. Size Selectivity - Trawl Gear - Compared with longline gear, the trawl is a much more powerful tool for catching small fish. Codend selection is most important for small fish, but clogging of meshes (eg, by flatfish or rockfish) or large catches that stretch (close) the meshes, are factors that may give very poor selection properties.

c. Species Selectivity - Longlines have good species selective properties, and non-commercial bycatch is normally modest. A trawl will in principle catch all fish in the swept volume, except those that are selected through the meshes. Large bycatches of different non-commercial species are therefore not uncommon in trawling.

d. Fish Quality - Both longliners and trawlers may produce fish of high quality. However, big trawl hauls and hauls of long duration might lead to reduced quality, both because the fish are exposed to a high pressure in the codend, and because it might take too long before parts of the catch are processed. This is no problem in longlining since most of the fish are alive until onboard processing. Fish caught by longline are in general regarded to be of a better quality than trawl caught fish.

e. Negative Effects on the Environment - Ideally, a conservation oriented fishing method should not have destructive effects on the environment - bottom topography and bottom fauna. Longline gear fulfills this requirement. Trawl gear might on the other hand have severe impact on the

bottom environment. However, there is no available information regarding possible corresponding negative effects on the fish stocks.

f. Energy Conservation - Compared with trawling, longlining is regarded as a low energy fishing method. From a fuel saving point of view, longlining is superior to trawling. If the cost of longline bait is factored in, the longline fuel/catch ratio per kilogram of fish is still far below the relative fuel consumption in trawling.

The longline must be evaluated as a conservation-oriented gear, while trawling has a rather low conservation-oriented effect.

4. A METHOD FOR TESTING THE EFFECTIVENESS OF DIFFERENT FISHING BAITS IN THE SEA - Johnstone and Hawkins, Marine Laboratory Aberdeen, Scottish Fisheries Information Pamphlet Number 3, 1989.

During the 19th century the most popular demersal fishing method in Scottish waters was the long line. By 1880, however, the trawl and steam trawler had been introduced to east coast grounds, and the beginning of the 20th century saw a decrease in line fishing. The main advantage of the trawl over the long line was its greater efficiency in terms of catch per unit effort, ie more fish caught for the labour expended. Nevertheless line fishing has some advantages over more efficient methods. First, line caught fish are usually of much higher quality and command higher prices than net-caught ones. Secondly, lining is a more selective fishing method, and by alteration of the bait, the hook, or the line configuration different species or different sizes of fish can be caught and the capture of immature fish avoided. Also, with increasing fuel costs lining has become a much more attractive economic proposition, particularly since the method permits areas to be exploited which may be inaccessible to nets.

5. A BIOECONOMICAL MODEL OF AN AGE-STRUCTURED GROUND FISH RESOURCE, EXPLOITED BY A MULTI-GEAR FISHING FLEET, O'Boyle, Sinclair and Hurley, Rapp. P. V. Reun. Cons. Int. Explor. Mer. XX:000-000, 1990.

A bioeconomic model of the Scotian Shelf (Nova Scotia) groundfish fishery involving trawler and longliner fleets was constructed to examine the biological, economic, and regulatory consequences of the interaction of these two fleets. Trawlers catch younger fish than longliners and the revenue-cost pictures are very different. The results of simulation indicated that both yield and employment were superior for longliners. However, trawlers, although

experiencing higher operating costs, could "out-compete" longliners due to higher sustained catch rates and thus revenue per unit cost. From a regulatory point of view, it was determined that under the assumptions of this study, the fishery could be managed by regulating only trawler activity. The longliner fleet could be left essentially unregulated since it is not economical for it to overfish the stock.

Conflicts have arisen between longline and trawl fishermen in the Scotian Shelf groundfish fishery regarding access to the resource. Transfers between fleets have usually been one way - from longliners to trawlers. Two factors are responsible for this. First, trawlers harvest large numbers of young cod which are not yet recruited to the longline fishery. Second, longlines are size-selective, and tend to catch larger, older fish. Trawl fishing mortality substantially reduces abundance before cod reach the size at which they are vulnerable to longlines. From an economic perspective, the longliner fleet has a clear advantage over the trawlers. The fixed price of fish to longliners is higher than to trawlers, and the cost per day of fishing is lower. From the standpoint of maximizing net revenues, employment and salaries there are advantages to a pure longline fishery. By gaining access to the resource first, however, trawlers will reduce the yield potentially available to longliners.

The results of the study indicate for the Scotian Shelf fishery (1) that the economic yield and employment picture is superior for longliners, (2) that without constraints, the trawlers will "out-compete" the longliners; (3) that longliners are unlikely to over-exploit the resource; and (4) that effort regulation is only necessary for trawlers to protect the cod resource.

6. FISHING AND STOCK FLUCTUATIONS, Laevastu and Favorite, Fishing News Books Ltd., 1988.

The quantitative increase of fish consumed in relation to the size of cod is shown in Figure 5.16. This fact might become significant in future fisheries management as the realization that recruitment in many species might be controlled by predation gains wider acceptance. It might be desirable to promote the catching of larger predators, for example, by a longline fishery, to decrease predation of prefishery juveniles. Large cod are also an important predator of commercially valuable crabs (Robichaud et al., 1986), thus it might be beneficial for crab stocks to hold stocks of large cod down by heavy exploitation... (p. 97)

Discards are fish which are caught but thrown back into the sea because they are below the legal size, too small,

unmarketable, deformed, and/or infested with visual parasites...In some regions, such as the NE Pacific, the prevailing fishery regulations prohibit the retention of some high priced fish, such as salmon and halibut...Mixed catches and bycatches arise because the gear, especially mobile gear such as the trawl, catches everything accessible to it on the bottom in front of its sweep...Different gear has, however, different selectivity in respect to species and sizes...a fishery for pelagic species with purse seines can be rather selective...Longlines can be selective to some degree depending on the hook size and bait used...(pp. 132, 133)

Although discards are unavoidable, it is of some importance in research assessment that discards be included in estimates of the total catch of a given species, and that their role in regard to resource assessment, future recruitment, and food balance in the ecosystem be considered. At present, considerable effort is made in ICES countries to account for the effects of discards in stock assessment by adjusting the data on the reported landings and their age composition. However, other parts of the world, such as the NE Pacific, the amounts of discards (other than "prohibited species") are not [explicitly] estimated and consequently are not [explicitly] accounted for in stock assessment...(p.136)

Little can be done technically to decrease the amounts of discards. The selection of proper mesh size, alteration of the rigging of the trawl, and changing the area, ground and depth of fishing are the main, but often ineffective, attempts to decrease undesirable bycatches. The regulatory limitation of bycatch of prohibited species has been designed to prevent "foreign" fishing or to shift it to other areas. The latter can work only to a very limited degree in specific locations; the shifting of vessels from an otherwise profitable fishing ground will nearly always result in considerably lower and, in most cases, unprofitable catches. The possible changes to the rigging of the gear have also been tried, but with little general success (Japan Fisheries Agency, 1986). Obviously, in some cases the increase of mesh size will decrease the bycatch of undersized species to a limited degree (Lamp and Weber, 1984)...(p. 137)

Although at present fisheries scientists have limited ability to explain the causal mechanisms of recruitment fluctuations or to predict stock sizes four or five years ahead, fishery managers have some means available to reduce the unfavorable effects of the variability of catches on the fishing industry. Examples are, limitations in landings or limitations of gear, and influencing the size and composition of the fleet...(p. 187, emphasis added)

The trawl fisheries of the eastern Bering Sea and Gulf of Alaska (EBS/GOA) have been regulated by a number of time and area closures. Most of these closures were made not for the protection of the target stocks or their life history components, but for the purposes of minimizing the incidental catch of certain species or avoiding conflict with other fisheries (e.g., eastern Bering Sea crab and halibut stocks and fisheries)...(p. 202)

At pages 202-203 (see appendix 6), the authors emphasize the difficulties in obtaining accurate estimates of the catch, discards of undersized or undesirable species, and discards of prohibited species, of distant water factory trawlers and mothership fleets - even with observers aboard.

Several profound changes have occurred in marine fisheries and their resources in the last two decades...the causes of large fluctuations of stocks is not fully known nor has knowledge of the effects of fishing on stocks much improved. Furthermore, as many governments have stepped into the fisheries management with new vigor, "overmanagement" rather than "overfishing" has become a concern in some regions, such as the eastern Bering Sea and Gulf of Alaska...(p. 207)

The effects of a given fishing effort on a stock depends on the selectivity and effectiveness of the gear and the behaviour of fish in respect to the gear. Some progress on the study of the latter subject has been made, whereas the effectiveness of trawls in respect to different species is poorly known...It appears that gear which requires little energy, such as longlines and gill nets, is being increasingly used in preference to active gear. Research on the improvement of these passive gears, including the use of artificial baits, effective hook spacing, effects of tidal currents on catches, etc. is in progress in several laboratories...(p. 208)

Full utilization of marine living resources would also require the utilization of discards. These vary normally between 30% and 50% of catches, but can reach as high as eight times the landings in the Gulf of Mexico shrimp fishery. Utilization of discards raises several problems such as space on vessels and processing...(p. 211)

Since most of the marine fish resources are nearly fully exploited, fishing is now moving from a hunting stage to one of cultivation as evidenced in this decade by rapid expansion of mariculture...The real cultivation state in marine fisheries will most probably start with manipulation or steering of the fish ecosystems at large with a selective, directed fishing effort...(p. 122, emphasis added)

A new fairness issue might be the "fairness toward the ecosystem" -- i.e., utilization of the production in a fish ecosystem for the optimum provision of fish and other marine organisms consumed by humans... (p. 213)

7. A BLUEPRINT FOR THE YEAR 2000, Peter Matthews, paper presented to the Oceans Institute of Canada International Longlining Symposium, Halifax, Nova Scotia, November, 1990.

Mr. Matthews is Vice President, Fleet Operation, Clearwater Fine Foods. He was formerly employed by the U.K. White Fish Authority, Industrial Development Unit. His experience includes the management of a large fleet of stern trawlers and offshore longliners on the Atlantic coast of Canada. His subject was "Costs of Longlining vs. Trawling".

After comparing traditional fixed and variable costs for the operation of several classes of vessel, Mr. Matthews offered the view that environmental costs must be factored into the equation if the true costs of catching fish are to be determined. He pointed out that trawlers off the Atlantic provinces catch fish much smaller and younger than those caught by longliners, resulting in lost fishing opportunity from the fish that are not allowed to grow. He also stressed that the discard rate of longliners in the fishery is only two tenths of one per cent of their harvest - far less than that of the trawl fleet. His list of additional costs of trawler production includes:

- The cost of damaged, discarded, and immature fish;
- The losses to the fishery due to the harvest of immature fish which are not able to add significant weight or to spawn before they are harvested;
- The loss of employment caused by the above;
- The cost to society (taxpayers) of the micromanagement and enforcement necessary to police the trawl fishery (which he believes greatly exceeds the cost of managing a longline fishery);
- The cost of bailing out companies and communities after stock collapses which come about through the acceleration of natural cycles by the overcapacity and overexploitation of fish stocks by trawlers;
- The cost of innumerable government studies, commissions, task forces, etc., to assist in management; and
- The high overhead costs that management companies incur to control and administer their trawler fleets in

compliance with the growing web of regulations designed to implement micromanagement plans.

He concludes that if these costs were accurately measured and factored in, the true cost of landing a pound of fish with a trawler would be significantly higher than a pound of fish landed by a longliner. He argues that the "hidden" costs of operating trawl fleets are a worldwide problem - "There might have been a few lone voices out there, trying to highlight the problems with trawler technology, but they have been pushed to one side by the majority, myself included, who had only one desire and that was to catch more fish 'economically' ". He observes that there have been three separate government studies into the state of the Atlantic groundfish fishery, all of which have failed to recognize that one of the major problems is the technology employed.

Mr. Matthews' "Blueprint for the Year 2000" contains, among others, the following recommendations:

a. There must be a significant phasing out of offshore trawlers, to be replaced by offshore longliners. Trawl technology would continue to be used to catch fish such as flatfish and shrimp which are not available to passive gear;

b. The groundfish plan must be amended to recognize that different fishing technologies have different impacts on the resource - and that these impacts should be taken into account in making allocations;

c. The fisheries management process must be altered. The current consultative process favors trawl interests, and longline interests should be better represented. Management by "destructive consensus" must cease;

d. Regulations should encourage trawlers to switch to longline gear;

e. Longliners should be managed by hook size only; the hook size should make it probable that the fish will spawn at least twice prior to capture;

f. A special program should be developed to deal with the catching of northern cod. This will recognize the necessity of using trawl technology in the winter due to ice conditions on the grounds; research should be undertaken to study the effect of trawling during the spawning period; and

g. Cod should be managed by numbers of fish removed rather than by volume. An average size of 19" should be required, so that fish have an opportunity to spawn before being harvested.

Mr. Matthews closes his presentation by observing that the conservation problems caused by excessive use of trawl technology had been identified by a Royal Commission of Fisheries as early as 1928. He calls for the development of a fishery which gives prominence to the modern longliner.

8. INDEPENDENT REVIEW OF THE STATE OF THE NORTHERN COD STOCK, Dr. L. Harris, Communications Directorate, Department of Fisheries and Oceans, Ottawa, Ontario, Canada, February, 1990.

The Harris Commission, appointed to examine the status of northern cod stocks off the Atlantic coast of Canada and to make recommendations for its recovery and management, submitted its findings and recommendations to the Minister of Fisheries and Oceans in February of 1990.

The Commission found that the Atlantic cod grounds had been exploited since the 1480's, that the cod stocks had provided the economic foundation for settled communities in Newfoundland, Laborador, and Nova Scotia, and that overall the stocks had historically sustained the fishing pressure imposed upon them without exhibiting any obvious sign of decreasing abundance.

"By the middle of the twentieth century, however, new fishing technologies were being introduced at an increasingly rapid rate. Chief among them was the comparatively heavily powered vessel equipped with otter trawls that was capable of fishing in deeper waters than were heretofore accessible and of exploiting the large concentrations of fish that at the end of their autumn migrations were assembled for spawning in the outer shelf regions of the several offshore banks." Newly improved gillnetters also participated in this offshore fishery.

Later the modern factory trawler arrived. "Then came the burgeoning of offshore technology, with West Germany in the vanguard and other European nations quickly following and the notorious assault upon the spawning aggregations on the northern banks during the late 1960s and 1970s. With catches reaching 800,000 tons in the peak year of 1968, the predictable result was a collapse of the stock with inshore landings falling to figures lower than any recorded in the previous centuries." (Emphasis added. Note that since implementation of the Magnuson Act such uncontrolled exploitation has been preventable, and has not occurred off Alaska.)

In 1977 Canada declared a two hundred mile management zone, and adopted a management strategy aimed at rebuilding depleted stocks and establishing fishing strategies which would ensure their long-term viability. Ten years later it

became apparent that the strategy was not working. The Harris Commission found that scientists and managers had placed excessive faith in mathematical modelling techniques and short data series, and had failed to recognize the statistical inadequacies in their biomass assessments. These difficulties were compounded by the misreporting of catches, bycatches, and discard rates, and other significant inaccuracies in the commercial catch data.

After examining the situation extensively and holding numerous public hearings to gather testimony, the Commission made management recommendations, including the following:

a. That fishing mortality imposed on northern cod stocks should be reduced;

b. That fishing mortalities imposed during the spawning period should be reduced through a combination of seasonal closures and catch reductions. (The Commission concluded that the state of current knowledge is such that it could not answer the question whether intense fishing on spawning cod populations disturbs either the mating behavior or the spawning success of the stocks, or leads to localized depletions - and that conservative management is required);

c. That for both biological and economic reasons the size selectivity of traps, trawls, gillnetts, and other gear types should be examined immediately to reduce the harvest and bycatch of cod less than six years of age; and

d. That fishing effort by large trawlers should be distributed among statistical areas to reflect the distribution of exploitable cod biomass.

REPORT OF THE IMPLEMENTATION TASK FORCE ON NORTHERN COD, E. B. Dunne, Fisheries and Oceans, October, 1990.

The Harris Commission's main recommendations on cod stock management (above) involved reducing the level of catch, restrictions on fishing activity during the spawning season, reducing the catch of small fish and ensuring offshore trawl effort is distributed over all components of the stock. An Implementation Task Force appointed to follow up on these recommendations reached the following conclusions:

a. That stock rebuilding must be started with an immediate, even if modest, reduction in catch;

b. That directed fishing for northern cod should be prohibited during the peak spawning season;

c. That in order to protect small cod a minimum size should apply to trap-caught cod and the trap mesh should be

increased in size, that trawl meshes should be increased in size, that a minimum hook size should be established for hand lines and longlines, and that non-cod directed fisheries should be managed to eliminate the catch of small cod; and

d. That proportionate harvesting requirements by statistical area be maintained.

- Problem 1** Harvesting Capacity in Excess of that required to harvest the available resource.
- Problem 2** Allocation and preemption conflicts between and within industry sectors, such as with inshore and offshore components.
- Problem 3** Preemption conflicts between gear types.
- Problem 4** Gear conflicts within fisheries where there is overcrowding of fishing gear due to excessive participation and surplus fishing effort on limited grounds.
- Problem 5** Dead-loss such as with ghost fishing by lost or discarded gear.
- Problem 6** Bycatch loss of groundfish, crab, herring, salmon, and other non-target species, including bycatch which is not landed for regulatory reasons.
- Problem 7** Economic loss and waste associated with discard mortality of target species harvested but not retained for economic reasons.
- Problem 8** Concerns regarding vessel and crew safety which are often compromised in the race for fish.
- Problem 9** Economic instability within various sectors of the fishing industry, and in fishing communities caused by short and unpredictable fishing seasons, or preemption which denies access to fisheries resources.
- Problem 10** Inability to provide for a long-term, stable fisheries-based economy in small economically disadvantaged adjacent coastal communities.
- Problem 11** Reduction in ability to provide a quality product to consumers at a competitive price, and thus maintain the competitiveness of seafood products from the EEZ off Alaska on the world market.
- Problem 12** Possible impacts on marine mammals and seabirds, and marine habitat.
- Problem 13** Inability to achieve long-term sustainable economic benefits to the nation.
- Problem 14** A complex enforcement regimen for fishermen and management alike which inhibits the achievement of the Council's comprehensive goals.

For purposes of illustration, consider how a fixed-gear-only directed BSAI fishery for cod would address the 14 problems identified earlier in our offshore fisheries (we understand that the Council does not intend to make the directed fishery fixed-gear only; but to the extent fixed gear is used, the identified benefits should be achieved).

Problem 1 Harvesting capacity in excess of that required to harvest the available resource.

The 1996 BSAI cod TAC is 280,000 mt. Longliners have the capacity to take about 130,000 mt if they fish all year. Pot boats would have to take the remaining 150,000 mt. It would undoubtedly take all year - it is unlikely that there is excess fixed gear harvesting capacity for the BSAI cod fishery.

Problem 2 Allocation and preemption conflicts between and within industry sectors, such as with inshore and offshore components.

In a fixed-gear fishery, longliners would be limited to about 130,000 mt of cod. Almost all of the balance would go inshore, greatly increasing inshore deliveries. Fixed gear operators fish slowly, and cannot preempt one another.

Problem 3 Preemption conflicts between gear types.

Longline gear and pot gear are fished in different areas; longliners fish well to the north, while pot fishermen fish in the Aleutian passes. Longline gear is not greatly affected by single pots fished on buoys.

Problem 4 Gear conflicts within fisheries where there is overcrowding of fishing gear due to excessive participation and surplus fishing effort on limited grounds.

See above.

Problem 5 Dead-loss such as ghost fishing by lost or discarded gear.

Longlines are not known to ghost fish to any significant degree. Pots may ghost fish, but biodegradable panels minimize the problem.

Problem 6 Bycatch loss of groundfish, crab, herring, salmon and other non-target species, including bycatch which is not landed for regulatory reasons.

The use of fixed gear minimizes the bycatch loss of prohibited and other species - this may be its most important characteristic.

Problem 7 Economic loss and waste associated with discard mortality of target species harvested and but not retained for economic reasons.

Discard and waste of target species is minimized with fixed gear. Trawlers, on the other hand, discarded 37,500 mt of cod in their directed BSAI cod fishery in 1995 (NMFS).

Problem 8 Concerns regarding vessel and crew safety which are often compromised in the race for fish.

Fixed gear harvests slowly - there is no race. It would take fixed gear operators all year to harvest the BSAI cod TAC.

Problem 9 Economic instability within various sectors of the fishing industry, and in fishing communities caused by short and unpredictable fishing seasons, or preemption which denies access to fisheries resources.

A fixed gear fishery would last all year - there would be no unpredictability or preemption. To the extent that pot boats can work out of local communities, shoreside deliveries would increase in those communities.

Problem 10 Inability to provide for a long-term, stable fisheries-based economy in small economically disadvantaged adjacent coastal communities.

See Problem 9, above. Pot boats could deliver increased amounts of cod to coastal communities.

Problem 11 Reduction in ability to provide a quality product to consumers at a competitive price, and thus maintain the competitiveness of seafood products from the EEZ off Alaska on the world market.

Hook-and-line caught cod is in demand worldwide, and is much preferred to trawl-caught cod. Pot-caught cod can be of very high quality.

Problem 12 Possible impacts on marine mammals and seabirds, and marine habitat.

Fixed gear has minimal impact on marine mammals and seabirds. Seabirds can be avoided altogether by longliners through adequate weighting of the lines. Fixed gear does not disturb the marine habitat to any significant degree.

Problem 13 Inability to achieve long-term sustainable economic profits to the nation.

A fixed gear cod fishery would minimize the bycatch of small cod, thus helping to assure a long-term sustainable fishery and continuing profits. Hook-and-line caught cod always bring higher prices than trawl-caught cod.

Problem 14 A complex enforcement regimen for fishermen and managers alike which inhibits the achievement of the Council's comprehensive goals.

A fixed-gear fishery is conducted slowly, and is easy to stop when quotas are reached - overruns are minimal. There is no need for expensive, complex and problematic regulations focusing on individual vessels.