MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: November 27, 1996

ESTIMATED TIME
11 HOURS
(for all D-1 items)

SUBJECT: Final BSAI Groundfish Specifications for 1997

ACTION REQUIRED

(e) Review 1997 BSAI Final Stock Assessment and Fishery Evaluation (SAFE) document.

(f) Approve final BSAI groundfish specifications for 1997:

1. Acceptable Biological Catch (ABC) and annual Total Allowable Catch (TAC)
2. Division of the pollock ITAC into the January 1-April 15 ('A' Season) and September 1-December 31 ('B' Season) allowances;
3. Seasonal apportionment of the fixed gear Pacific cod TAC; and
4. Bycatch allowances, and seasonal apportionments of Pacific halibut, red king crab, Tanner crab, and herring to target fishery (PSC) categories.

BACKGROUND

At this meeting, the Council recommends groundfish and bycatch specifications as listed above. These final specifications will be used for management of the 1997 groundfish fisheries.

(e) BSAI SAFE Document

The groundfish plan teams met in Seattle November 18-22, to prepare the final SAFE documents provided at this meeting. This SAFE forms the basis for final groundfish specifications for the 1997 fishing year, and contains the plan team's estimates of biomass and ABCs for BSAI groundfish species, and information to guide the Council in establishing PSC apportionments. The attached tables from the SAFE list the plan team's recommended 1997 ABCs and corresponding overfishing levels for each of the species or species complexes. Draft minutes of the team meeting are also attached (Item D-1(e)(1)).

(f) Final ABCs, TACs, and Apportionments

Attached as Item D-1(f)(1) are Tables 6 - 8 from the SAFE summary chapter indicating ABCs and biomass levels. The team's sum of recommended ABCs for 1997 is 2,551,865 mt. Overall, the status of the stocks continues to appear relatively favorable, although in some cases biomass is expected to decline because recruitment is below average.

Adopt seasonal allowances for pollock.

The FMP requires the Council to apportion pollock in the BSAI between the roe (January 1 - April 15) and non-roe (September 1 - December 31) seasons. For the 1991 and 1992 fisheries, the Council recommended a 40/60

percent split between the roe and non-roe seasons, and a 45/55 percent split for the 1993-1996 pollock fishery. In recommending seasonal allowances of the BSAI pollock TAC, the Council will need to consider the following factors as outlined in the FMP:

1. Estimated monthly catch and effort.
2. Expected changes in harvesting and processing capacity.
3. Current estimates of and expected changes in pollock biomass, and conditions of other fish and marine mammal stocks.
4. Potential impacts of seasonal fishing on pollock stocks, marine mammals, and other fish stocks.
5. The need to obtain fishery-related data throughout the year.
6. Effects on operating costs and gross revenue.
7. The need to spread fishing effort over the year.
8. Potential allocative effects among users and indirect effects on coastal communities.
9. Other biological and socioeconomic information.

The Council also may set a limit on the amount of pollock that may be taken in the bottom trawl pollock fishery to control the bycatch of crab and halibut (Amendment 16a). However, for the past 6 years, the Council has not recommended a specific apportionment between pelagic and bottom gears, noting that additional pollock harvests with non-pelagic trawl gear likely would be constrained by halibut bycatch. In recommending apportionment of pollock between gears, the Council would need to consider PSC limits, projected bycatch, costs, and other factors consistent with goals of the FMP (675.24).

Adopt seasonal apportionments of the Pacific cod TAC allocated to fixed gear.

Amendment 24 regulations allow seasonal apportionment of the Pacific cod TAC allocated to vessels using hook-and-line or pot gear. Seasonal apportionments will be divided among trimesters and established through the annual specifications process. In recommending seasonal apportionments, regulations require the Council to base its decision on the following information:

1. Seasonal distribution of Pacific cod relative to PSC distribution;
2. Expected variations in PSC bycatch rates in the Pacific cod fishery throughout the fishing year; and
3. Economic effects of any seasonal apportionment of Pacific cod on the hook-and-line and pot gear fisheries.

Under Amendment 46, two percent of the TAC is reserved for jig gear, 51 percent for fixed gear, and 47 percent for trawl gear. The trawl apportionment will be split between catcher vessels and catcher processors 50/50. Any unused TAC from the jig gear quota will become available to fixed gear on September 15.

For the 1996 fisheries, the Council recommended that 79% of the fixed gear's allocation be released during the first trimester (January 1 - April 30), 18% for the second trimester (May 1 - August 31), and 3% for the third trimester.

Adopt bycatch allowances of Pacific halibut, red king crab, Tanner crab (*C. bairdi*), and herring, and seasonal allowances.

Halibut PSCs

For the Trawl Fisheries: Amendment 21 established a 3,775 mt limit on halibut mortality for trawl gear. This limit can be apportioned to the following trawl fishery categories:

1. Greenland turbot, arrowtooth flounder and sablefish;
2. rock sole and "other flatfish;"
3. yellowfin sole;
4. rockfish;
5. Pacific cod; and,
6. pollock, Atka mackerel and "other species."

Note that under Amendment 46, the trawl halibut PSC mortality cap for Pacific cod will be no greater than 1,600 mt.

For Fixed Gear Fisheries: A 900 mt non-trawl gear halibut mortality can be apportioned to the following fishery categories:

1. Pacific cod;
2. Other non-trawl (includes hook-and-line sablefish, rockfish and jig gear); and
3. Groundfish pot (recommended exempt for 1996).

Note that under Amendment 46, the hook-and-line halibut PSC mortality cap for Pacific cod will be no greater than 900 mt. Item D-1(f)(2) is a table indicating 1996 PSC allocations and seasonal apportionments for the trawl and non-trawl fisheries. Item D-1(f)(3) is a current summary of PSC bycatch accounting for the 1997 BSAI fisheries.

Crab PSCs

In June 1996, the Council approved a stairstep procedure for determining PSC limits for red king crab taken in Zone 1 trawl fisheries. Amendment 37, recently approved by the Secretary, specifies PSC limits based on abundance of Bristol Bay red king crab as shown in the adjacent table. Given NMFS and ADF&G's 1996 abundance estimate for Bristol Bay red king crab, a Zone 1 PSC limit will be established at 100,000 red king crabs for 1997.

Amendment 37 PSC limits for Zone 1 red king crab.

Abundance	PSC Limit
Below threshold or 14.5 million lbs of effective spawning biomass (ESB)	35,000 crabs
Above threshold, but below 55 million lbs of ESB	100,000 crabs
Above 55 million lbs of ESB	200,000 crabs

In September, the Council approved the agreement negotiated by affected industry groups regarding PSC limits for C. bairdi Tanner crab taken in BSAI trawl fisheries. Under Amendment 41, PSC limits for bairdi in Zones 1 and 2 will be based on total abundance of bairdi crab as indicated by the NMFS trawl survey. Based on 1996 abundance (185 million crabs), the PSC limit for C. bairdi in 1997 will be 750,000 crabs in Zone 1 and 2,100,000 crabs in Zone 2. Crab bycatch accrued from January 1 until publication of the final rule (expected by April 1997) will be applied to revised bycatch limits established for specified fisheries.

Amendment 41 PSC limits adopted for bairdi Tanner crab.

Zone	Abundance	PSC Limit
Zone 1	0-150 million crabs	0.5% of abundance
	150-270 million crabs	750,000
	270-400 million crabs	850,000
	over 400 million crabs	1,000,000
Zone 2	0-175 million crabs	1.2% of abundance
	175-290 million crabs	2,100,000
	290-400 million crabs	2,550,000
	over 400 million crabs	3,000,000

The Council is scheduled to take final action on C. opilio snow crab PSC limits at this meeting. Any recommendations regarding PSC limits for snow crabs would be implemented during the 1997 fishing year.

Herring PSCs

Amendment 16a established an overall h erring PSC bycatch cap of 1 percent of the EBS biomass of herring. This cap is to be apportioned to the same six PSC fishery categories listed above, plus a seventh group, mid-water pollock. The Alaska Department of Fish and Game will supply its forecast for 1997 herring biomass at the Council meeting. The PSC limit is set at 1 percent of the biomass in metric tons. A revised herring assessment should be available by meeting time.

Seasonal Apportionment of PSC

The Council may also seasonally apportion the bycatch allowances. Regulations require that seasonal apportionments of bycatch allowances be based on the following types of information:

1. Seasonal distribution of prohibited species;

2. Seasonal distribution of target groundfish species relative to prohibited species distribution;

3. Expected prohibited species bycatch needs on a seasonal basis relevant to change in prohibited species biomass and expected catches of target groundfish species;

4. Expected variations in bycatch rates throughout the fishing year'

5. Expected changes in directed groundfish fishing seasons;

6. Expected start of fishing efforts; and

7. Economic effects of establishing seasonal prohibited species apportionments on segments of the target groundfish industry.

NOTE: Additional information on PSC limits and apportionments is presented in BSAI SAFE Appendix C.

Staff will present a worksheet with SSC and AP recommendations for ABCs, TACs, PSC and seasonal apportionments when the Council addresses this action item.

Draft Minutes of the Bering Sea/Aleutian Islands Groundfish Plan Team Meeting, November 18-22, 1996

Members Present:

Loh-lee Low (NMFS-AFSC, Chairman)
Dave Ackley (ADF&G)
Dave Colpo (NMFS -AFSC)
Richard Merrick (alternate, NMML)
Vivian Mendenhall (USFWS)
Brenda Norcross (UAF)
Mike Sigler (AFSC-ABL)
Andrew Smoker (NMFS-AKRO)
Grant Thompson (NMFS-AFSC)
Ivan Vining (ADF&G)
Farron Wallace (WDF)
Dave Witherell (NPFMC)

The Bering Sea/Aleutian Islands (BSAI) Groundfish Plan Team met November 18-22 at the Alaska Fisheries Science Center in Seattle. The meeting was open to the public, and several industry representatives attended. A packet of materials was distributed to team members prior to the meeting, and several additional documents were distributed at the meeting. The focus of the meeting was to review updated stock assessments and discuss ecosystems considerations.

The Plan Team reviewed the final assessments of groundfish for the 1997 fishery. Team recommendations are discussed in the SAFE summary chapter, and therefore not repeated here. Rather, these minutes reflect team deliberations and suggestions to assessment authors regarding future assessments.

The Team spent considerable time reviewing the eastern Bering Sea pollock assessment. Two independent assessments provided about the same biomass level and ABC recommendation for 1997 (about 1.1 million mt). The difference between the assessments was the biomass projections for future years. The primary assessment maintained that recruitment of the 1994 year-class would be about average based on age 1 trawl survey index. The alternative assessment assumed a poor 1994 year-class based on below average age 2 hydroacoustic survey index. Discussion focused on how well the two surveys predicted year-class strength. Generally, the age 2 hydroacoustic survey has provided good estimates of recruitment, but in this case the estimate was questionable. All pollock of the 1994 year-class detected in the 1996 survey were taken at only a few stations, all of which were along the northwest edge. It was noted that additional information will be available for next years assessment of this year-class: 1997 U.S. trawl and hydroacoustic surveys, Russian data from 1996, and the possibility of a Russian survey in 1997.

The Plan Team had a number of recommendations to assessment authors, and ideas to revise SAFE report guidelines. In August, the Team noted that maps showing distribution of catches from surveys and fisheries would be useful. It was also suggested that authors provide some type of retrospective analysis of biomass projections to see if there was any systematic bias. Some of these recommendations were incorporated into the November assessments. Specific recommendations from the November meeting are listed below for individual species assessments.

Pacific cod: The Team suggests that the assessment use a biologically based estimate of natural mortality for next years assessment. Data on longevity and GSI are available, and this information suggests that lower estimates of M may be more appropriate. The team also suggested that the author allow the model to estimate catchability (q).

Sablefish: the plan team recommended that a sensitivity analysis be conducted to examine how different recruitment scenarios affect biomass projections. Authors should examine the Japanese longline survey data prior

to 1977 for recruitment strength and biomass estimates. The Plan Team also requested that authors provide more information on age structure of the population in a matrix of population numbers at age for years 1977-1996.

Both sablefish and Greenland turbot live on the upper continental slope as adults and migrate from the shelf to the slope during their early life history. Because of this commonality, it would be a useful exercise for the sablefish and Greenland turbot authors to compare habitat occupied and estimated fish densities to ensure that these values are consistent.

Greenland turbot: The Team suggests that information regarding predation of turbot by killer whales should be added to the assessment. Also, a large number of fishery operations successfully caught Greenland turbot on the shelf between the Aleutian and Pribilof Islands (Figure 4.2). Is this a directed or a bycatch fishery for Greenland turbot? Are the length frequencies from the shelf and adjacent slope fisheries different?

Longline surveys provide an index of adult abundance. Only the index from the Bering Sea from 1984-93 was used in the assessment, yet an index also is available from the Aleutian Islands region and for other years. We suggest that the author use a combined (Bering/Aleutians) index in the assessment and use all available years of data. Since these areas are planned to be surveyed alternate years in the future (Aleutians 1996, Bering 1997,...), we suggest that to create the Bering/Aleutians index, the author interpolate each area (Aleutians or Bering) for unsampled years, as is done for sablefish.

Yellowfin Sole: The Team noted that a (spawning) $B_{40\%}$ could be calculated from available data, and ABC and OFL could be based on a tier 3 strategy.

Rock Sole: The Team requested that maturity at age and size be explicitly stated in the assessment. Because recruitment data for this stock appear reliable, the Team noted that a $B_{40\%}$ could be calculated from available data, and ABC and OFL could be based on a tier 3 strategy.

Flathead Sole: The Team requests that the author develop an age or size-structured model for this species next year.

Other Flatfish: The Plan team requested that the author report the catch and survey data of the "other flatfish" category by species. If targeted, the minor species in this group could be over harvested, given that the ABC is based primarily on Alaska plaice. Consideration should be given to breaking out the deepwater components of this complex (Dover sole and Rex sole). The Team also noted that a $B_{40\%}$ could be calculated for Alaska plaice from available data, and ABC and OFL could be based on a tier 3 strategy.

Pacific Ocean Perch: Tabulate biomass by depth and year from trawl surveys in the Bering Sea and Aleutian Islands.

Other Rockfish: The Plan Team requested that authors attempt an age structured model of the AI and GOA thornyhead stock together, using longline survey data. Species composition of the other rockfish group should be clearly listed, and trawl biomass estimates should be provided for each species separately. Catch of each species should also be provided separately, and broken down by gear type.

Atka mackerel: Depletion estimates of Atka mackerel biomass were computed for local fishery areas. We suggest that the authors compare these estimates to the trawl survey estimates for the corresponding areas.

The Plan Team also discussed assessments for other groundfish species, ecosystems considerations, and reviewing updated status of seabirds and marine mammals. This information is included in the SAFE document. The Team also identified research priorities; these are in addition to those already recommended by the Team and SSC at previous meetings.

1996 BSAI Groundfish Research Priorities

1. Evaluate closure areas for their effectiveness of 1) stated purpose, 2) species composition changes, 3) secondary effects (e.g. shifts to other fisheries), 4) biological changes: recruitment, productivity (eg. trawl plowing the bottom and releasing nutrients).

2. Evaluate the choice of exploitable biomass as a measure of stock status. Is exploitable biomass appropriate? Is spawning biomass "better"? How should exploitable biomass be calculated if used as a measure? This discussion arose in the yellowfin discussion because they mature after entering the fishery.

3. Collect and analyze flatfish maturity data. The intent is to provide other information to estimate natural mortality. The intent also is to calculate B40% (spawning biomass). Arrowtooth flounder and flathead sole are pointed out as species where information should be relatively easy to collect since they spawn during the winter when the fishery occurs. Alaska plaice are summer spawners and information could be collected during a summer survey.

4. Tag pollock, Pacific cod, Atka mackerel, Greenland turbot, and thornyheads.

5. Evaluate fishing gear effects on seafloor habitat.

6. NMFS should form a group of scientists assigned full-time to evaluate ecosystem effects. The group should consist of at least a modeler to develop a multispecies model(s) and an anthropologist to collect historical information from coastal inhabitants and fishermen.

Others in attendance at the BSAI team meetings were:

Lauri Jansen
Wally Pereyra
John Roos
Fran Bennis
Tamra Farris
Ken Stump
Dan Waldeck
Thorn Smith
Mike Szymanski
Lowell Fritz
Brent Paine
Dave Fraser
Vince Curry
John Hendershedt
Kim Dietrich
Paul McGregor

Draft

Bering Sea and Aleutian Islands Groundfish Plan Team
Final Recommended 1997 Catch Specifications (mt)

Species	Area	1997 Biomass	1997 OFL	1997 ABC	1996 Specifications 1996 ABC	1996 TAC	1996 Catch*
Pollock	EBS	6,120,000	1,980,000	1,130,000	1,190,000	1,190,000	1,098,510
	"A" season					45%	45%
	"B" season					55%	55%
	AI	100,000	28,000	28,000	35,600	35,600	26,286
	Bogoslof	558,000	157,000	115,000	121,000	1,000	390
Pacific cod	BS/AI	1,590,000	418,000	306,000	305,000	270,000	235,022
Yellowfin sole	BS/AI	2,530,000	339,000	233,000	278,000	200,000	130,009
Greenland turbot	BS/AI	118,000	25,100	16,800	10,300	7,000	6,332
	BS				67%	67%	4,679
	AI				33%	33%	1,653
Arrowtooth	BS/AI	587,000	167,000	108,000	129,000	9,000	13,803
Rock sole	BS/AI	2,390,000	427,000	296,000	361,000	70,000	46,970
Flathead sole	BS/AI	632,000	145,000	101,000	116,000	30,000	16,795
Other flatfish	BS/AI	616,000	150,000	97,500	102,000	35,000	18,543
Sablefish	EBS	17,900	2,750	1,500	1,200	1,100	622
	AI	18,600	2,860	1,560	1,300	1,200	695
POP complex							
True POP	EBS	72,500	5,400	2,800	1,800	1,800	2,633
Other POP	EBS	29,700	1,400	1,050	1,400	1,260	195
True POP	AI	324,000	25,300	12,800	12,100	12,100	12,785
	Eastern			3,240	3,025	3,025	3,192
	Central			3,170	3,025	3,025	3,034
	Western			6,390	6,050	6,050	6,559
Sharp/Northern	AI	96,800	5,810	4,360	5,810	5,229	6,696
Short/Rougheye	AI	45,600	1,250	938	1,250	1,125	946
Other rockfish	EBS	7,100	497	373	497	447	164
	AI	13,600	952	714	952	857	273
Atka mackerel	AI	450,000	81,600	66,700	116,000	106,157	103,378
	Eastern			15,000	26,700	26,700	27,693
	Central			19,500	33,600	33,600	33,505
	Western			32,200	55,700	45,857	42,180
Squid	BS/AI	n/a	2,620	1,970	3,000	1,000	1,166
Other species	BS/AI	688,000	138,000	25,800	27,600	20,125	20,935
BS/AI TOTAL		**17,004,800**	**4,104,539**	**2,551,865**	**2,820,809**	**2,000,000**	**1,743,148**

EBS = eastern Bering Sea
BS/AI = Bering Sea & Aleutian Islands
BS = Bering Sea
AI = Aleutian Islands

OFL = overfishing level
ABC = acceptable biological catch
TAC = total allowable catch

* = catch as of 10/26/96.

Table 6-- Summary of stock abundance (biomass), overfishing level (OFL), and fishing mortality rates (F) for the eastern Bering Sea (EBS), Aleutian Islands (AI), and Bogoslof district as projected for 1997. Biomass and OFL are in metric tons, reported to three significant digits. Fs are reported to two significant digits.

Species	Area	Biomass[a]	OFL[b]	F_{OFL}[c]	F_{ABC}[d]
Walleye pollock	EBS	6,120,000	1,980,000	0.46	0.30
	AI	100,000	28,000	0.57	0.38
	Bogoslof	558,000	157,000	0.37	0.27
Pacific cod	BSAI	1,590,000	418,000	0.38	0.27
Yellowfin sole	BSAI	2,530,000	339,000	0.16	0.11
Greenland turbot	BSAI	118,000	25,100	0.56	0.35
Arrowtooth flounder	BSAI	587,000	167,000	0.34	0.22
Rock sole	BSAI	2,390,000	427,000	0.22	0.15
Flathead sole	BSAI	632,000	145,000	0.23	0.16
Other flatfishes	BSAI	616,000	150,000	0.31[e]	0.20[e]
Sablefish	EBS	17,900	2,750	0.16	0.088
	AI	18,600	2,860	0.16	0.088
POP complex					
True POP	EBS	72,500	5,400	0.079	0.049
Other red rockfish[f]	EBS	29,700	1,400	0.047	0.035
True POP	AI	324,000	25,300	0.10	0.049
Sharp/Northern[g]	AI	96,800	5,810	0.060[h]	0.045[h]
Short/Rougheye[i]	AI	45,600	1,250	0.028[h]	0.021[h]
Other rockfish	EBS	7,100	497	0.070[j]	0.053[j]
	AI	13,600	952	0.070[j]	0.053[j]
Atka mackerel	AI	450,000	81,600	0.50	0.36
Squid	BSAI	n/a	2,620	n/a	n/a
Other species	BSAI	688,000	138,000	0.20	0.038

a/ Projected Jan. 1997 biomass for the age+ range reported in summary section.
b/ Maximum 1997 catch level allowable under overfishing definition (the "overfishing level").
c/ Maximum fishing mortality rate allowable under overfishing definition.
d/ Fishing mortality rate corresponding to acceptable biological catch.
e/ Alaska plaice rate shown as an example.
f/ Sharpchin, northern, shortraker, and rougheye rockfish.
g/ Sharpchin and northern rockfish.
h/ Weighted average of species-specific rates.
i/ Shortraker and rougheye rockfish.
j/ Shortspine thornyhead rate shown as an example.

Table 7-- Total allowable catch (TAC) and acceptable biological catch (ABC) for 1996 (as established by the Council) and 1997 (as recommended by the Plan Team) for groundfish in the eastern Bering Sea (EBS), Aleutian Islands (AI), and Bogoslof district. Figures are in metric tons.

Species	Area	TAC (1996) Council	ABC(1996) Council	ABC(1997) Plan Team
Walleye pollock	EBS	1,190,000	1,190,000	1,130,000
	AI	35,600	35,600	28,000
	Bogoslof	1,000	121,000	115,000
Pacific cod		270,000	305,000	306,000
Yellowfin sole		200,000	278,000	233,000
Greenland turbot		7,000	10,300	16,800
Arrowtooth flounder		9,000	129,000	108,000
Rock sole		70,000	361,000	296,000
Flathead sole		30,000	116,000	101,000
Other flatfish		35,000	102,000	97,500
Sablefish	EBS	1,100	1,200	1,500
	AI	1,200	1,300	1,560
POP complex				
True POP	EBS	1,800	1,800	2,800
Other red rockfish	EBS	1,260	1,400	1,050
True POP	AI	12,100	12,100	12,800
Sharp/Northern	AI	5,229	5,810	4,360
Short/Rougheye	AI	1,125	1,250	938
Other rockfish	EBS	497	497	373
	AI	952	952	714
Atka mackerel		106,157	116,000	66,700
Squid		1,000	3,000	1,970
Other species		21,125	27,600	25,800
Groundfish complex		2,000,000	2,820,809	2,551,865

e 8-- Summary of stock biomass, harvest strategy, 1997 recommended acceptable biological catch (ABC), and stock condition for groundfish in the eastern Bering Sea (EBS), Aleutian Islands (AI), and Bogoslof district. Biomass and ABC are in metric tons, reported to three significant digits. Fishing mortality rates are reported to two significant digits.

Species	Area	Biomass[a]	Rate[b]	ABC	Relative abundance, trend[c]
Walleye pollock	EBS	6,120,000	$F_{40\%}$	1,130,000	Average, declining
	AI	100,000	$F_{40\%}$	28,000	Low, declining
	Bogoslof	558,000	$F_{40\%}$	115,000	Low, unknown
Pacific cod		1,590,000	$F_{40\%}$	306,000	Average, declining
Yellowfin sole		2,530,000	$F_{40\%}$	233,000	High, declining
Greenland turbot		118,000	$F_{40\%}$	16,800	Low, declining
Arrowtooth flounder		587,000	$F_{40\%}$	108,000	High, declining
Rock sole		2,390,000	$F_{40\%}$	296,000	High, declining
Flathead sole		632,000	$F_{40\%}$[d]	101,000	High, declining
Other flatfish		616,000	$F_{40\%}$[d]	97,500	High, declining
Sablefish	EBS	17,900	F_{CY}[e]	1,500	Low, declining
	AI	18,600	F_{CY}[e]	1,560	Low, declining
POP complex					
True POP	EBS	72,500	$F_{44\%}$[f]	2,800	Low, stable
Other red rockfish	EBS	29,700	$F=M$	1,050	Not available
True POP	AI	324,000	$F_{44\%}$[g]	12,800	high, stable
Sharp/Northern	AI	96,800	$F=M$	4,360	Not available
Short/Rougheye	AI	45,600	$F=M$	938	Not available
Other rockfish	EBS	7,100	$F=M$[d]	373	Not available
	AI	13,600	$F=M$[d]	714	Not available
mackerel	AI	450,000	$F_{40\%}$[h]	66,700	Average, declining
[illegible]d	BSAI	n/a	F_{his}[h]	1,970	Not available
Other species		688,000	F_{his}[h]	25,800	Not available
Groundfish Complex Total		17,004,800		2,551,865	Above average, declining

a/ Projected Jan. 1997 biomass for the age+ range reported in summary section.
b/ Harvest strategy used to compute ABC.
c/ Relative abundance based on long-term average, trend based on short-term projection.
d/ Proxy values used for some species.
e/ "Constant yield" fishing mortality rate: the rate that sets 1997 ABC = 1996 ABC.
f/ Adjusted on the basis of the relationship between projected biomass and $B_{40\%}$.
g/ Adjusted so as to set ABC equal to the equilibrium catch corresponding to $F_{44\%}$.
h/ Fishing mortality rate implied by setting ABC equal to historic average catch.

Table 1. **Final 1996 BSAI Trawl Fisheries PSC Apportionments and Seasonal Allowances**

Fishery Group	Halibut Mortality Cap (mt)	Herring (mt)	Red King Crab (animals) Zone1	C. bairdi Zone1	C. bairdi Zone2
Yellowfin sole	820	287	50,000	250,000	1,530,000
January 20 - March 31	160		5,000	50,000	
April 1 - May 10	150		15,000	200,000	
May 11 - August 14	100		10,000		
August 15 - Dec 31	410		20,000		
Rocksole/other flatfish	730		110,000	425,000	510,000
January 20-March 29	453				
March 30 - June 28	139				
June 29-December 31	138				
Turbot/sablefish/ Arrowtooth	0				0
Rockfish	110	7			10,000
Jan. 1 - Mar. 29	30				
Mar. 30 - June 28	50				
June 29 - Dec. 31	30				
Pacific cod	1,685	22	10,000	250,000	260,000
January 20-October 24	1,585				
Oct. 25-December 31	100				
Pollockmackerel/o.species	430	154	30,000	75,000	690,000
January 20-April 15	330				
April 16- December 31	100				
Pelagic Trawl Pollock		1,227			
TOTAL	**3,775**	**1,697**	**200,000**	**1,000,000**	**3,000,000**

Note: unused PSC allowances may be rolled into the following seasonal apportionment.

Final 1996 BSAI Non-Trawl Fisheries PSC Bycatch Allowances and fixed gear Pacific cod seasonal apportionements

Fishery Group	Halibut Mortality (mt)	Seasonal Apportion of cod ITAC (mt)
Pacific Cod	800	
Jan 1 - April 30	475	80,000
May 1 - August 31	40	18,000
Sept. 1 - Dec. 31	285	2,980
Other Non-Trawl*	100	
Groundfish Pot	Exempt	
TOTAL	900 mt	100,980

Note: unused PSC halibut from first trimester will be rolled into the third trimester.

* 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.

NMFS/AKR
11/27/96
16:31:55

1996 BERING SEA/ALEUTIAN ISLANDS FISHERIES
PROHIBITED SPECIES BYCATCH MORTALITY
Week Ending: 11/23/96

TRAWL HERRING, BSAI

Fishery group	Herring (mt)	Cap (mt)	%
Midwater pollock	1,044	1,227	85%
Pacific cod	19	22	87%
Yellowfin sole	250	287	87%
Rockfish	0	7	0%
Other	76	154	49%
Total:	1,389	1,697	82%

TRAWL SALMON, BSAI

Fishery group	Chinook (#'s)	Other (#'s)	Total (#'s)
Midwater pollock	51,576	75,532	127,108
Pacific cod	5,890	190	6,080
Yellowfin sole	30	251	282
Rock sole/Other flatfish	481	0	481
Rockfish	439	186	626
Other	6,132	2,720	8,853
Seasonal Total:	64,548	78,880	143,429
Annual Cap:	48,000		
Remaining:	-16,548		

TRAWL BAIRDI TANNER CRAB

	ZONE 1			ZONE 2		
Fishery group	Crabs (#'s)	Cap (#'s)	%	Crabs (#'s)	Cap (#'s)	%
Rock sole/Other flatfish	342,452	345,000	99%	128,186	510,000	25%
Pacific cod	122,813	250,000	49%	37,012	260,000	14%
Yellowfin sole	292,023	330,000	88%	787,315	1,530,000	51%
PLCK/AMCK/OTHER	24,915	75,000	33%	11,055	690,000	2%
Rockfish	0	0	0%	0	10,000	0%
Rockfish	0	0	0%	434	10,000	4%
GTRB/ARTH/SABL	0	0	0%	0	0	0%
GTRB/ARTH/SABL	0	0	0%	1,470	0	0%
Total:	782,203	1,000,000	78%	965,471	3,010,000	32%

TRAWL RED KING CRAB

	ZONE 1		
Fishery group	Crabs (#'s)	Cap (#'s)	%
Rock sole/Other flatfish	9,085	110,000	8%
Pacific cod	2,650	10,000	26%
Yellowfin sole	689	50,000	1%
PLCK/AMCK/OTHER	4,411	30,000	15%
Total:	16,834	200,000	8%

Yellowfin Sole Fishery Seasons/Quotas:

Red King Crab Bairdi Tanner Crab - Zone 1

http://wwwfak.afsc.noaa.gov/1996/bsatrw96.txt

Jan 20 - Mar 31	=	5,000
Apr 01 - May 10	=	15,000
May 11 - Aug 14	=	10,000
Aug 15 - Dec 31	=	20,000
Annual Total		50,000

Jan 20 - Mar 31	=	50,000
Apr 01 - Dec 31	=	200,000
Annual Total		250,000

http://wwwfak.afsc.noaa.gov/1996/bh1.txt

NMFS/AKR
11/27/96

1996 BERING SEA / ALEUTIAN ISLANDS FISHERIES
FIXED GEAR HALIBUT BYCATCH MORTALITY (METRIC TONS)

	PACIFIC COD HOOK & LINE		OTHER SPECIES HOOK & LINE, JIG		ALL GROUNDFISH POT GEAR	
WED	WEEKLY	TOTAL	WEEKLY	TOTAL	WEEKLY	TOTAL
01/06/96	47	47	0	0	0	0
01/13/96	22	69	0	0	0	0
01/20/96	22	91	0	0	0	0
01/27/96	20	111	0	0	0	0
02/03/96	28	139	0	0	0	0
02/10/96	14	153	0	0	0	0
02/17/96	16	169	0	0	0	0
02/24/96	19	188	0	0	0	0
03/02/96	20	209	0	0	0	0
03/09/96	25	233	0	0	0	0
03/16/96	22	256	0	0	0	0
03/23/96	25	280	0	0	0	0
03/30/96	17	297	0	0	0	1
04/06/96	17	314	0	0	0	1
04/13/96	18	331	0	0	0	1
04/20/96	27	359	0	0	1	2
04/27/96	37	396	0	0	1	2
05/04/96	20	416	32	32	1	4
05/11/96	14	430	43	75	1	5
05/18/96	10	440	12	88	1	6
05/25/96	0	440	1	88	1	8
06/01/96	0	440	0	89	1	9
06/08/96	0	440	0	89	1	10
06/15/96	0	440	0	89	1	10
06/22/96	0	440	0	89	0	11
06/29/96	0	440	0	89	0	11
07/06/96	0	440	0	89	0	11
07/13/96	0	440	1	90	0	11
07/20/96	0	440	0	90	0	11
07/27/96	0	440	0	90	0	11
08/03/96	0	440	0	90	1	12
08/10/96	0	440	0	90	1	13
08/17/96	0	440	0	90	1	13
08/24/96	0	440	0	90	1	14
08/31/96	0	440	0	90	1	15
09/07/96	38	478	0	90	1	16
09/14/96	40	518	0	90	0	16
09/21/96	49	567	0	90	0	16
09/28/96	55	623	0	90	0	16
10/05/96	42	665	0	90	1	16
10/12/96	34	699	0	90	0	17
10/19/96	42	741	0	90	1	18
10/26/96	27	768	0	90	0	18
11/02/96	29	797	0	90	0	18
11/09/96	3	800	0	90	0	18
11/16/96	0	800	0	90	0	18
11/23/96	0	800	0	90	0	18

PCOD SEASONAL CAP: 800 OTHER SEASONAL CAP: 100 Pot gear is exempt
% OF SEASONAL CAP: 100% % OF SEASONAL CAP: 90% from bycatch allowances

REMAINING PCOD: 0 REMAINING OTHER: 10

1996 BSAI NON-TRAWL PACIFIC COD FISHERY HALIBUT BYCATCH ALLOWANCES

(Jan 01 - Apr 30)	475 MT
(May 01 - Aug 31)	40 MT
(Sep 01 - Dec 31)	285 MT
Annual Total	800 MT

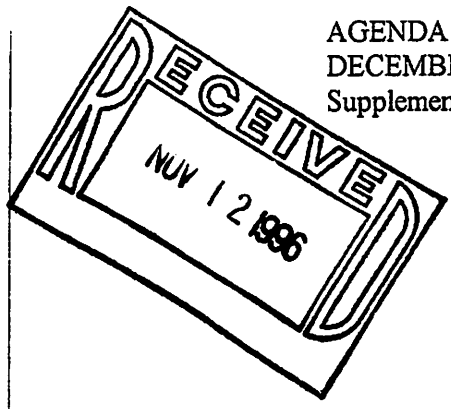
http://wwwfak.afsc.noaa.gov/1996/bt1.txt

NMFS/AKR
11/27/96
16:36:48

1996 BERING SEA / ALEUTIAN ISLANDS FISHERIES
TRAWL HALIBUT BYCATCH MORTALITY (METRIC TONS)

WED	PACIFIC COD	YELLOWFIN SOLE	ROCK SOLE/ FLATHEAD SOLE/ OTHER FLATFISH	PLCK/AMCK/ OTHER	ROCKFISH	ARROWTOOTH/ SABLEFISH/ TURBOT
01/20/96	4	0	0	0	0	0
01/27/96	38	0	54	20	0	0
02/03/96	24	0	130	36	0	0
02/10/96	41	0	41	33	0	0
02/17/96	16	0	96	90	0	0
02/24/96	20	0	85	8	0	0
03/02/96	88	0	47	14	9	0
03/09/96	125	20	0	17	8	0
03/16/96	81	69	0	2	2	0
03/23/96	112	26	0	7	0	0
03/30/96	125	18	0	1	0	0
04/06/96	108	29	34	10	0	0
04/13/96	169	37	41	0	0	0
04/20/96	171	32	12	3	1	0
04/27/96	87	25	0	0	1	0
05/04/96	166	41	0	0	2	0
05/11/96	75	15	0	0	2	0
05/18/96	33	12	0	0	3	0
05/25/96	0	34	0	2	1	0
06/01/96	0	20	0	0	1	1
06/08/96	0	16	44	0	0	0
06/15/96	0	50	0	1	0	0
06/22/96	10	11	0	0	0	2
06/29/96	1	0	0	0	0	0
07/06/96	0	0	17	35	0	1
07/13/96	0	0	25	11	0	0
07/20/96	0	0	23	2	0	3
07/27/96	0	0	43	4	0	1
08/03/96	0	0	14	7	0	0
08/10/96	0	0	0	0	0	0
08/17/96	0	25	0	2	0	0
08/24/96	0	111	0	0	0	0
08/31/96	0	64	0	0	0	0
09/07/96	0	23	0	5	0	0
09/14/96	0	33	0	8	0	0
09/21/96	1	44	0	8	0	0
09/28/96	0	50	0	11	0	0
10/05/96	0	22	0	12	2	0
10/12/96	0	0	0	18	16	0
10/19/96	0	14	0	15	0	0
10/26/96	0	77	0	2	0	0
11/02/96	100	0	0	1	0	1
11/09/96	48	0	0	0	0	0
11/16/96	0	0	0	0	0	0
	1,643	920	704	389	47	10
SEASONAL CAP:	1,685	870	730	430	60	0
% OF CAP:	98%	106%	96%	91%	78%	0%
REMAINING:	42	-50	26	41	13	-10
ANNUAL CAP:	1,685	870	730	430	60	0
% OF CAP:	98%	106%	96%	91%	78%	0%

TOTAL HALIBUT MORTALITY : 3,713
TOTAL ANNUAL HALIBUT CAP: 3,775



AGENDA D-1(e)
DECEMBER 1996
Supplemental

November 12, 1996

NPFMC

Attention: CLARENCE PAUTZKE

I am writing you concerning the fact that Ron Berg has informed me that cod fixed gear reserves were somehow decided not to be released until September 1 this last year but by a mistake they were released as they have been in the past.

The effect of not releasing these reserves is the closing of pot cod fishing early in the summer. This is great for the longline fleet but very detrimental to the pot fleet. I was told the council directed NMFS to proceed in this manner yet I believe this never came before the advisory panel and the public did not have a chance to comment.

I hope when the AP goes through the spec process in December this will be on our agenda.

Thank you for your consideration on this matter.

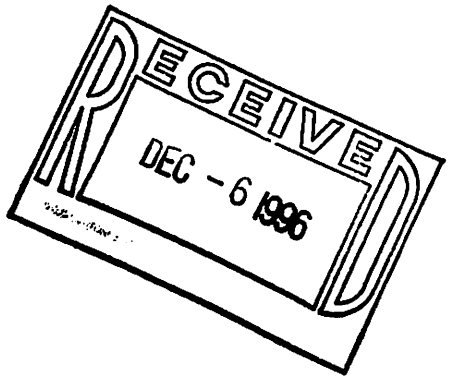
Michael (Spike) Jones

DEPARTMENT OF FISH AND GAME

COMMERCIAL FISHERIES MANAGEMENT AND DEVELOPMENT DIVISION

P.O. BOX 25526
JUNEAU, ALASKA 99802-5526
PHONE: (907) 465-4210

December 5, 1996



Dr. Clarence Pautzke
Executive Director
North Pacific Fisheries Management Council
P.O. Box 103136
Anchorage, AK 99510

Dear Dr. ~~Pautzke~~ Clarence:

The Alaska Department of Fish and Game estimates that the biomass of eastern Bering Sea herring returning to spawn in the spring of 1996 between Port Moller and Norton Sound will be approximately 157,887 metric tons (Table 1). This is a very slight decline from last year's estimate of 169,700 metric tons.

All Bering sea herring stocks are considered to be healthy and are expected to be above their thresholds for 1997. In almost all areas the age composition is dominated by the 1987 and 1988 year classes (Figure 1), which were aged 8 and 9 in 1996. The 1989 year class was weak everywhere. For herring spawning north of Togiak, the 1990 and 1991 year classes (aged 5 and 6) are at least moderately strong and are expected to support these populations as the 1987 and 1988 age classes approach senescence. Biomass in all areas is expected to decline moderately in 1997 (Figure 2).

Under Amendment 16A to the Bering Sea/Aleutian Islands groundfish fishery management plan, a prohibited species catch limit would be set at 1% of this biomass, or 1,579 metric tons.

Sincerely,

Robert C. Clasby
Director

Enclosures

cc: Dave Witherell

bcc: Earl Krygier

Table 1. Summary of preliminary 1997 forecast run biomass, and threshold levels for herring spawning in the eastern Bering Sea, by fishery area.

Fishery	Forecast Run Biomass (metric tons)	Forecast Run Biomass (short tons - 2,000 lbs)	Threshold (short tons - 2,000 lbs)
Port Moller	1,501	1,655	1,000
Bristol Bay (Togiak)	113,398 [a]	125,000 [a]	35,000
Kuskokwim Area			
Security Cove	4,210	4,640	1,200
Goodnews Bay	4,311	4,752	1,200
Cape Avinof	4,239	4,672	500
Nelson Island	4,802	5,294	3,000
Nunivak Island	3,448	3,801	1,500
Cape Romanzof	4,090	4,508	1,500
Norton Sound	17,888	19,718	7,000
Total:	**157,887**	**174,040**	
PSC Limit (at 1% of run biomass):	1,579		

[a] Preliminary 1996 aerial survey biomass estimate. The 1997 forecast biomass is expected to be similar.

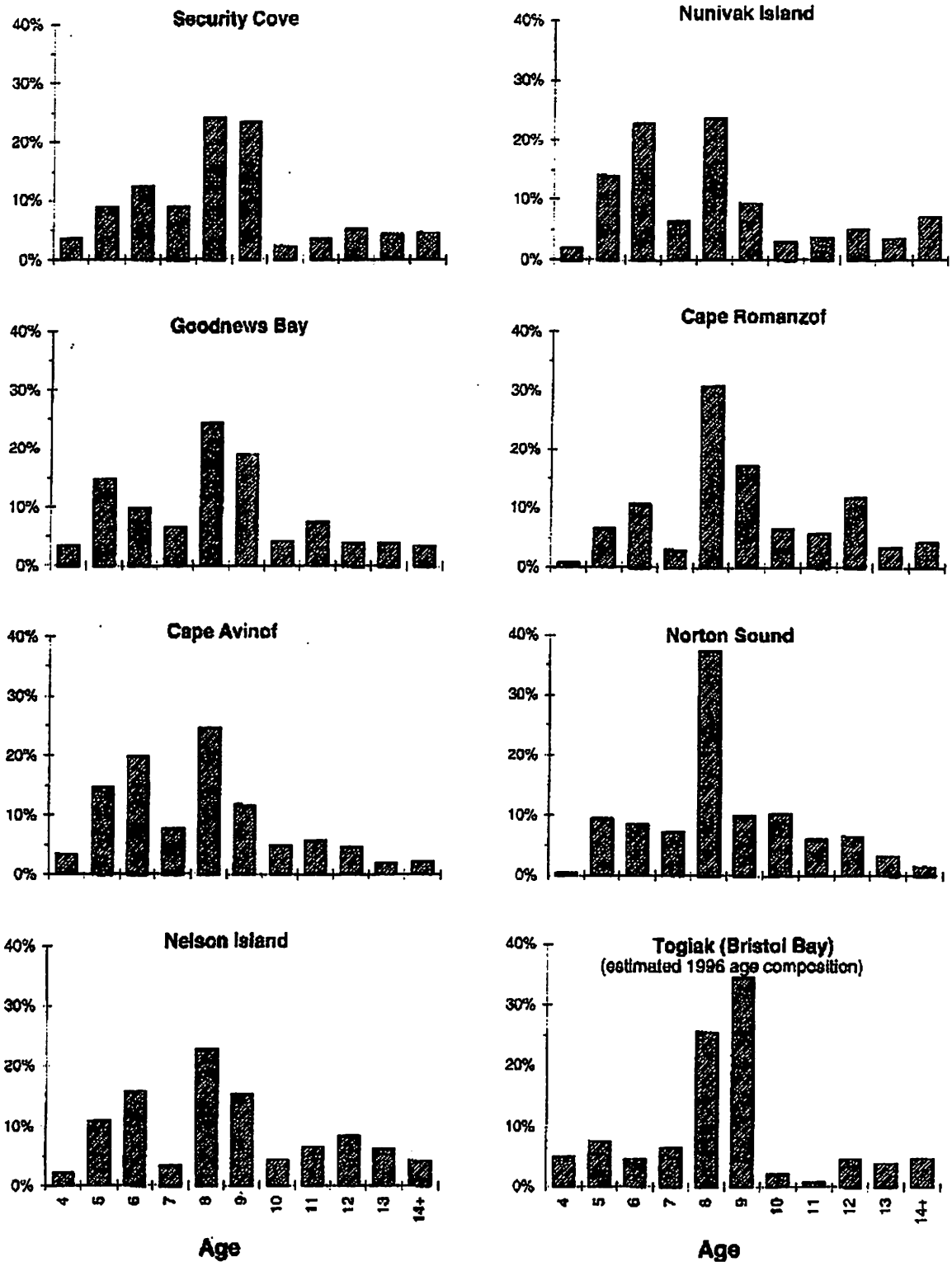


Figure 1. Observed run age composition by weight in 1996 at major herring spawning locations in the eastern Bering Sea. The observed 1996 age composition is not yet available for Togiak. The estimated 1996 age composition is shown.

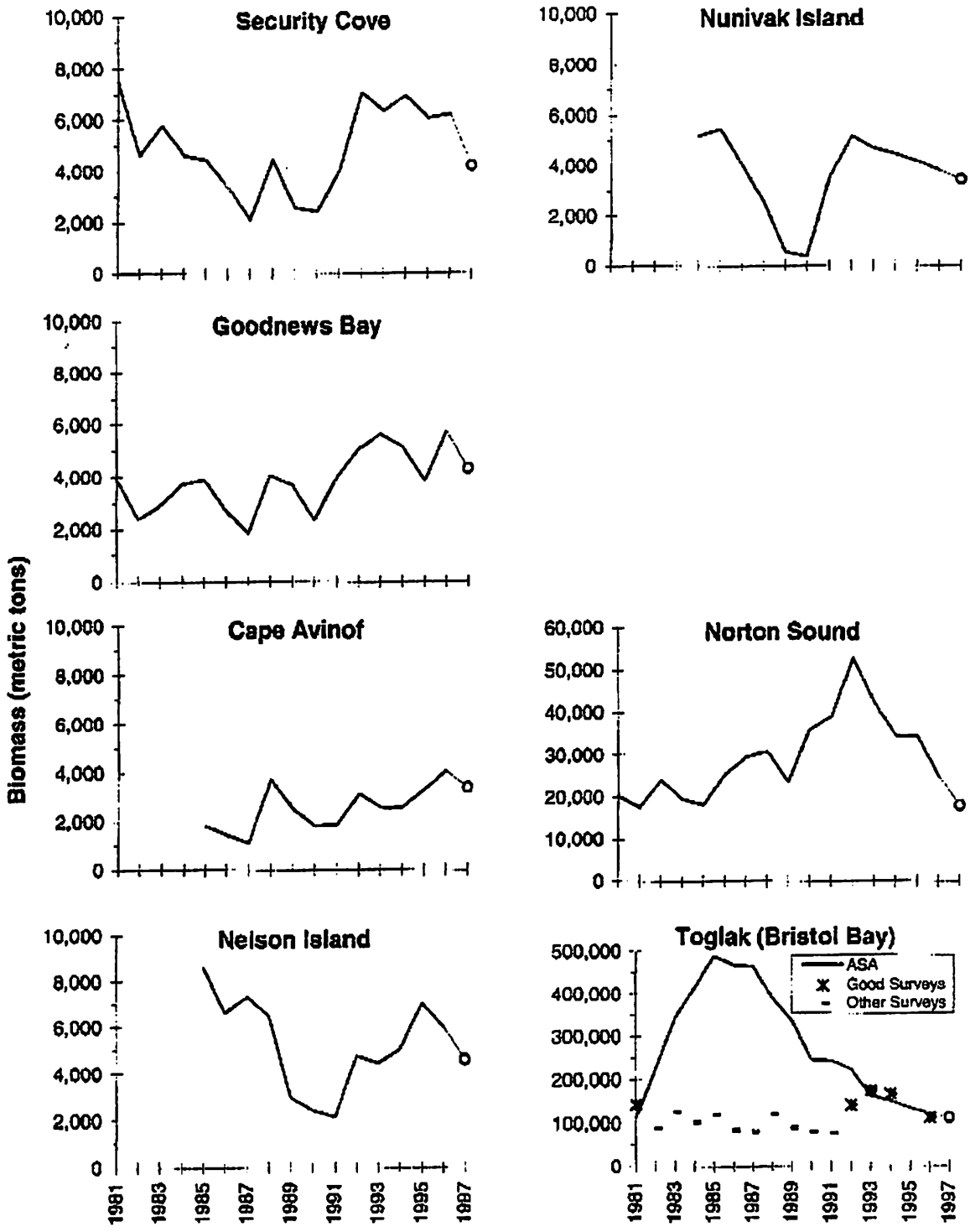


Figure 2. Estimated run biomass at major herring spawning locations in the eastern Bering Sea, 1981-96, with preliminary 1997 forecast run biomass.

ADELAIDE • AMSTERDAM • ANCHORAGE • AUCKLAND • BOSTON • BRUSSELS • BUENOS AIRES • CHICAGO • COPENHAGEN • FORT LAUDERDALE • GOTHENBERG • HAMBURG • LEWES — U.K. • LONDON • LUXEMBOURG • MADRID • MONTREAL • OSLO • PALMA PARIS • ROME • SAN FRANCISCO • SAN JOSE — COSTA RICA • SEATTLE • STOCKHOLM • SYDNEY • TORONTO • VANCOUVER • VIENNA WASHINGTON • WORLD PARK BASE — ANTARCTICA • ZURICH

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12/4/96
VIA FAX

Richard Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

RE: Groundfish specifications for Bering Sea/Aleutian Islands pollock for 1997.

Mr. Chairman:

On behalf of Greenpeace, we are submitting the following comments for consideration at the Council's December, 1996 meeting at which time the final Bering Sea/Aleutian Islands pollock catch levels will be set for 1997.

Greenpeace has long maintained that the high-volume pollock fishery has in the past and continues to distort and alter the North Pacific ecosystem, and should be reduced to a lower level of exploitation for that reason. We do not believe that the currently recommended BS/AI pollock ABC/TAC of 1.1 million metric tons is sufficiently conservative to meet the needs of other species. Additionally, it poses the risk of a serious stock depletion and steep reductions in catch after 1997.

Based on the data from the 1996 EBS pollock survey, the stock (age 3+) is down 50% or more from the mid-1980s. The virtual absence of age 1-2 pollock in the survey indicates the likelihood of poor recruitment into the fishery in the near future. The BS/AI Plan Team meetings of Nov. 18-21 acknowledged these concerns but ultimately concluded that next year's EBS pollock survey should clarify the situation with regards to recruitment beyond 1997. Until then, the Plan Team recommends a pollock ABC and TAC at the 31-year average of 1.1 million metric tons.

Greenpeace takes the opposite view: until the results from next year's survey are known, the Council should take a more risk-averse approach and reduce next year's catch quota. The declining biomass of the stock and the prospect of continuing poor recruitment, combined with continued low abundance of the Aleutian Basin/ Bogoslof Island stock, dictate a more conservative harvest strategy for 1997. Optimistic recruitment predictions beyond 1997 are nothing more than computer modelling exercises using a 17-year data series, and should be regarded as placeholders having very limited predictive value.

A reduction in catch for 1997 will serve several short-term goals by aiding in (1) mitigating further potential food web impacts resulting from low pollock biomass, (2) conserving the exploitable biomass in order to reduce the risk of severe stock depletion, (3) allowing more time to assess next year's survey data on future recruitment trends, and (4) easing the transition in the industry to lower catch levels based on what is known about current recruitment trends. In short, the Council should hedge its bets in the face of declining pollock trends and uncertainty about the future rather than waiting for the stock to crash before attempting to mitigate the damage.

The survey data and model forecast suggest that a failure to reduce catches now may require even steeper cuts in 1998. But while the potential for a sharp drop in pollock abundance is a threat to the overcapitalized pollock fishery, it poses an even greater threat to already depleted marine mammal and bird populations which rely on pollock. The widespread decline in top pollock predators should serve as a warning sign of an over-exploited ecosystem which can no longer support these wildlife species at their historical levels of abundance. In the words of the recent National Research Council report on the Bering Sea:

> "It seems extremely unlikely that the productivity of the Bering Sea ecosystem can sustain current rates of human exploitation as well as the large populations of all marine mammals and bird species that existed before human exploitation -- especially modern exploitation -- began."

In other words, unless exploitation of pollock is reduced, the recovery of depleted or endangered species appears unlikely. This is a key point which underlies our concern that the North Pacific is being over-exploited, despite the protestations of the Fisheries Service and North Pacific Council to the contrary.

RECOMMENDATIONS

In the interest of protecting pollock predators and ecosystem processes, as well as maintaining the long-term viability of the fishery, Greenpeace recommends a 35-40% reduction in the BS/AI pollock TAC for 1997. In addition, we are recommending that the Aleutian Islands allocation be designated as a bycatch-only fishery.

We believe a 35-40% reduction in the TAC is prudent from the point of view of the fishery alone, given the current declining status and poor recruitment of the stock. If recruitment indicators do not improve significantly, and if the stock continues to decline through 1997, the Plan Team the 1998 TAC could drop to under 700,000 metric tons and the risk of a severe stock depletion would increase substantially. A 35-40% reduction the 1997 TAC could avoid a much more drastic reduction later.

This number should not be regarded as a magic bullet that will ensure a "sustainable" level of exploitation in the context of the ecosystem. Rather, 35-40% is a first step toward the goal of allowing pollock stocks to recover a high proportion of their biomass that would occur in the absence of fishing in order to ensure that the pollock food web is not compromised. Given that pollock abundance fluctuates and that successful recruitment depends on numerous environmental variables which change from year to year, the exploitation rate which achieves the goal of maintaining a higher percentage of spawning biomass will also vary.

Furthermore, there is a compelling reason to believe that reductions in the "A" season roe fishery are likely to provide multiple benefits to pollock predators such as the endangered northern sea lion as well as marine bird species whose reproductive success has been strongly correlated with age 0-1 pollock abundance in the Pribilof Islands. The intensity of the pollock roe fishery in the eastern Bering Sea may reduce local availability of energy-rich pollock to foraging sea lions in particular.

Greenpeace is particularly concerned that the heavy concentration of fishing pressure on spawning pollock in the eastern Bering Sea "A" season may be depleting local areas of spawning pollock and depriving pregnant sea lions and weaned pups of a rich, concentrated, easily obtained food source in the critical winter months. Sea lions are known to forage far out at sea in winter, and readily available aggregations of energy-rich spawning pollock are thought to be crucial to the reproductive success of females and survival of weaned juveniles. Depletions of this important food source may cause food-stressed females to abort fetuses or wean nursing pups before they are able to feed themselves (Lavigne and NMML, 1991).

In addition, past studies of kittiwake and murre reproductive success on the Pribilof Islands show strong correlations with the abundance of age 0-1 pollock (Springer et al, 1986) in the eastern Bering Sea. Removal of large quantities of spawning pollock on the eastern Bering Sea shelf may be depriving these marine birds of young pollock prey that would otherwise have been produced earlier in the year. Studies have demonstrated that declines in kittiwake and murre populations on the Pribilofs since the 1970s have occurred in years of low availability of juvenile (<15 cm) pollock.

Current management of EBS pollock focuses on maximizing recruitment to the exploitable biomass rather than on maximizing the spawner biomass or the consistency of year class production for the ecosystem. Reduced availability of age 0-1 pollock to seabirds in areas such as the Pribilofs is but one example of the consequence of this management policy. The potential of overfishing and dangerously depleting the spawning stock is another, since reducing the spawning stock biomass is the intended outcome of this policy.

For all of the above reasons, Greenpeace recommends that a sizeable

proportion of the 35-40% reduction in TAC come from the pollock roe fishery.

SPATIAL CONCENTRATION OF THE BS/AI POLLOCK FISHERY

Although the annual eastern Bering Sea/Aleutian Island pollock allocation has remained fairly constant in the post-Magnuson Act era, there is a disturbing trend toward increasing concentration of fishing pressure and catch on the southeastern Bering Sea shelf in areas to the east and northeast of Area 518.

Upon closure of the Bogoslof pollock fishery (Area 518) in 1992, the pollock TAC remained constant -- meaning that the pollock harvest was effectively increased by 200,000 metric tons on the EBS shelf. Since 1991, pollock catch in the management areas 521 and 522 have declined steadily from over 500,000 metric tons (45% of TAC) to less than 100,000 tons (7%) in 1995 and 1996. Meanwhile harvests from the southeastern Bering Sea have risen from 654,000 metric tons (55% of TAC) to over 1.1 million metric tons (93%) in 1995 and 1996.

The catch quota has remained high throughout the 1990s but has been extracted from a smaller and smaller area. In effect, the southeastern Bering Sea has experienced an almost 50% increase in pollock catch since 1991. We believe that this intensified fishing pressure in a shrinking area is likely to have negative ecosystem impacts which neither the Council nor the Fisheries Service have addressed. There is no longer anywhere else to fish profitably for pollock and no way to spread out the fishing pressure and the harvest except by reducing the BS/AI catch significantly.

MSY FOR EASTERN BERING SEA POLLOCK

Management claims for sustainability of marine fisheries resources typically mean some level of continued, steady commodity production from individual species (Meyer and Helfman, 1993). The definition of overfishing in this context is "a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock to produce maximum sustainable yield on a continuing basis." (NPFMC, Draft 1997 Ecosystem Considerations)

Single-species management of pollock under MSY rests on the assumption that the stock can be fished down to half of its unfished "equilibrium population" in order to achieve maximum yield of new recruits to the fishery (Quinn and Collie, 1990). Based on Quinn and Collie's CAGEAN model, the biomass of pollock spawners which produces MSY is 6 million metric tons. According to the model, in the absence of fishing the stock biomass would stabilize at about 12 million tons on average. Even if pollock can withstand this level of exploitation indefinitely (30 years), that does not mean the Bering Sea ecosystem can.

MSY management of pollock in the eastern Bering Sea is intended to maximize production of recruits in a single-species context, without regard for the food web impacts at this level of exploitation. In order to minimize the risk of depleting or irreversibly altering the food web, Greenpeace believes that target stocks such as pollock should be maintained at a higher percentage of their estimated unfished biomass.

Additionally, MSY spawner-recruit estimates for pollock are gross oversimplifications and presume a greater ability to predict and control the population dynamics of the stock than actually exists. Generalizations about spawner biomass and recruitment are very different from knowing the actual quantity of spawners which will produce optimal year classes of pollock:

> "After many decades of intensive research on stock-recruitment problems, we now know that no simple relation exists between the size of the spawning stock and the amount of recruitment to an exploitable stock. It can only be stated in general terms that proportionally larger recruitment can result from a small spawning stock and proportionally smaller recruitment can result from a large spawning stock." (Laevastu and Favorite)

MSY estimates under current management of EBS pollock focus on maximizing recruitment to the exploitable biomass rather than on maximizing the spawner biomass or the consistency of year class production for the ecosystem. MSY gives fisheries scientists and managers the illusion of certainty that the current declining pollock abundance and recruitment trends will be reversed by large year classes and justifies unsustainably high harvest levels on the expectation of optimistic recruitment predictions for the future.

It is probably impossible to know what MSY for an individual stock is until it has been exceeded (Hilborn and Walters). Even supposing it is true that a lower spawner biomass may produce higher recruitment, MSY management also greatly increases the risk of stock collapse and offers no guarantee that big year classes will actually result. A larger spawning stock may dampen recruitment but poses no such risk of stock collapse or potential ecosystem damage.

ECOSYSTEM CONSIDERATIONS

Catch quotas for important prey fish need to be more conservative because abundance of these species varies naturally, and the ecosystem effects of natural fluctuations in abundance will be magnified by high-volume fishing.

Given the nodal position of pollock in the Bering Sea food web, we believe it is probable that current estimates of pollock predation are not adequately reflected in estimates of natural mortality. In addition to fish, pinnipeds and marine birds, pollock are preyed upon by some baleen whales (fin, sei, minke and humpback) as well

as Dall's porpoises, and may be seasonally important for beluga whales, harbor porpoises and killer whales (Lowry et al, 1988).

The uplisting of the Kenai-to-Kiska sea lion stock from "threatened" to "endangered" ought to be a signal to the Fisheries Service and the Council alike that current single-species management of the North Pacific pollock fisheries is unsustainable in an ecosystem context. Fishery effects on food availability are thought to be the only factor with a high likelihood of explaining the widespread and persistent declines of the Steller sea lion (NRC, 1996). Only by reducing pressure on sea lion prey are we likely to reverse their declines or the declines of other major pollock predators at the top of the food chain which are indicators of the integrity of the ecosystem processes which sustain them.

In addition to Steller sea lions, there have been large declines (50%) of fur seals since the 1970s which may be attributable to food shortages (Trites, 1990). Steep declines of harbor seals (Phoca vitulina) at Tugidak Island from 1977-88 occurred during and after the intensive trawl fishery for spawning pollock around Kodiak Island (Pitcher, 1990). Harbor seals are now declining in the Bristol Bay region, and are believed to have experienced an overall decline of 40% since the 1960s (NMFS, 1996).

Marine bird populations which rely on annual juvenile pollock availability for their reproductive success include black-legged kittiwakes and common and thick-billed murres, which have also declined since the 1970s in the principal area of study in the Pribilof Islands. Other pollock-eating seabirds which are known to be in decline include the red-legged kittiwake and three species of murrelet. Tufted and horned puffins, parakeet auklets and pelagic cormorants are also known pollock predators.

CONCLUSIONS

Given the evidence of declining pollock biomass and poor recruitment from the 1993 and 1994 year classes, Greenpeace recommends a reduction in the eastern Bering Sea pollock TAC of 35-40% for 1997. We recommend redesignating the Aleutian Basin portion of the pollock TAC as bycatch-only.

Greenpeace believes that the BS/AI pollock TAC reduction of 35-40% for 1997 is justified from the perspective of the fishery, quite aside from our concerns about overfishing in an ecosystem context. The most recent Bering Sea pollock survey indicates a stock in trouble. A 1.1 million metric ton TAC is justified only on the assumption that a big year class will appear in 1998 to replenish the stock, yet there is precious little evidence to justify this optimism.

The steady downward trend in pollock abundance has come at the same time that fishing effort on the southeastern Bering Sea shelf has increased dramatically. Catch in that area has increased nearly 50%

and has rapidly diminished the remainder of the older cohorts from the large '89 year class. Although a 35-40% reduction in the TAC will not achieve long-term sustainability and may not be sufficient to reverse declining trends in numbers of pollock predators throughout this region, it is a first step in the direction of a change in management that attempts to manage for the needs of the entire ecosystem. It may mitigate the worst effects of stock decline and relieve some of the fishing pressure on the southeastern Bering Sea, as well as minimize the risk of a stock crash in the near future.

Ultimately the North Pacific Council must reject flawed single-species management assumptions which we believe have precipitated this situation. The Council should adopt a precautionary, ecosystem-based management approach to the pollock fishery which maintains pollock spawner biomass nearer levels that would occur in the absence of fishing. The Council should acknowledge the importance of scientific data in the management of fisheries while recognizing its limitations. Science can neither prove that current pollock exploitation causes no harm to the ecosystem nor disprove our assertion that it is causing harm. In the face of formidable uncertainties, a precautionary and risk-averse harvest strategy recognizes how little we understand about the North Pacific ecosystem. Most importantly, it is a means of preventing damage rather than attempting to mitigate it after the fact

REFERENCES

D. Lavigne, Declaration, U.S. District Court, Western District of Washington, Case No. C91-887Z, July, 1991.

P.A. Livingston, "Importance of predation by groundfish, marine mammals and birds on walleye pollock and Pacific herring in the eastern Bering Sea," 1993.

L. Lowry, K. Frost, and T. Loughlin, "Importance of walleye pollock in the diets of marine mammals in the GOA and Bering Sea, and implications for fishery management," 1988.

National Research Council, "The Bering Sea Ecosystem," 1996.

National Marine Fisheries Service, Appendix A to the Preliminary Pollock stock assessment chapter.

North Pacific Fishery Management Council, Stock Assessment and Fishery Evaluation, 1996 and Draft 1997 Ecosystem Considerations chapter.

T.J. Quinn and J.S. Collie, "Alternative Population Models for Eastern Bering Sea Pollock," 1990.

T.J. Quinn and H.J. Niebauer, "Relation of eastern Bering Sea

walleye pollock (Theragra chalcogramma) recruitment to environmental and oceanographic variables," 1995.

National Marine Mammal Lab, "Northern Sea Lion Decline: Status and Proposed Actions," internal memo obtained by Greenpeace FOIA in 1991: "

> There are no major known natural environmental shifts which may have contributed to the decline. Northern fur seals, harbor seals, and some seabirds have also declined significantly, and all depend heavily on pollock."

And:

> "The February to April pollock roe fishery occurs at a time of presumed sensitivity for pregnant sea lions and weaned pups. This is a period of high energy demand for the females, and it coincides with poor weather and reduced space to haul out on land. REMOVAL OF LARGE QUANTITIES OF ENERGY-RICH SPAWNING FISH MAY COMPROMISE THE HEALTH OF PREGNANT FEMALES, THEIR FETUS, OR FORCE THEM TO WEAN THEIR PUPS BEFORE THE PUP CAN FEED ON ITS OWN."

A. Springer et al, "Seabird responses to fluctuating prey availability in the eastern Bering Sea," Marine Ecology Progress Series, Vol.32: 1-12, 1986.

Dec. 3, 1996

Mr. Rick Lauber, Chairman
Dr. Clarence Pautzke, Executive Director
North Pacific Fishery Management Council
Post Office Box 103136
Anchorage, Alaska 99510

Re: B-Season Pollock Start Date

Dear Rick,

The purpose of this letter is to request that the council review the impacts of its decision to delay the 96 pollock B-season in light of the experience of this year and to consider returning to an August start date for the 1997 B-season.

At the April 96 council meeting the council adopted the AP recommendation to move the start date to September 1st. That motion passed 9/8/3 in the AP. However the minority report, which stated that the delay:

"...originated at the request of a factory trawl company interested in salmon processing opportunities which may never materialize given the market conditions of the past few years. We feel that groundfish regulatory measures should primarily focus on the specifics of the fisheries being regulated by the Council and that the current starting date is appropriate based on the EA/RIR which balances bycatch impacts on chum and Chinook, balances CUPE and yield considerations with safety concerns of catcher boats about fishing after the equinox, and that August 15 is the optimum date."

It is significant that everyone on the AP who participates directly in the pollock fishery supported the August start date. It was signed by dave fraser, Pete Maloney, Stephanie Madsen, Dave Benson, Lyle Yeck, Al Burch, (and would have been signed by Craig Cross, however he left prior to the minority report being written up).

CPUEs for pollock in October were terrible this year, but this shouldn't have been a total surprise. October pollock fishing in past C - seasons and back in JV days was often much slower than in fishing in August, especially outside the CVOA. As a result,

- we spent more on fuel this year,
- we fished more days for the same number of tons,
- we had more wear and tear on the boat and gear,
- we fished in lousier weather,
- we missed part of hunting season,

None of the foregoing may have been of great concern to those on the AP and council who are not directly involved in the pollock fishery. ***However, there were other impacts which should be of particular concern to western Alaskans.*** Those impacts were the predictable (and predicted) impacts on herring and Chinook salmon bycatch. ***The late pollock season resulted in a 10,000 to 15,000 Chinook caught during the late portion of the B-season bycatch compared almost none in the 95 B-season, and a 250 metric ton increase in herring bycatch in the pollock fishery over 95.***

Despite the delay of the 96 B-season little if any salmon processing was done by factory trawlers. Unfortunately, salmon marketing is not a matter of "if you process them, the market will buy." The salmon dilemma, real as it is, is one of marketing, not one of a lack of processing capacity. As result sympathy for

salmon fishers is not an adequate basis for maintaining a delayed B-season in 1997, in the face of all the negative side effects.

Reviewing the start date will not take large amounts of staff resources. The February 96 council newsletter noted that last years action was going to rely largely on the original analysis by ISER which was stated to be "still relevant". That analysis, which was updated, combined with the actual experience of the 96 fishery, should provide an adequate basis for revisiting the start date question. Thus, the council should initiate a regulatory amendment process to shift the 97 B-season back to August.

Sincerely yours,

david fraser
F/V Muir Milach
PO Box 771
Port Townsend, Washington

Thorm Smith
D-1 et

FIXED GEAR (LONGLINE AND POT) REQUEST, 1997 BSAI COD TAC

1997 ABC	306,000 MT
1997 TAC	**270,000 MT (SAME AS 1996)**
FIXED GEAR	137,700 MT
ITAC	117,045
RESERVES	20,655

1997 SEASONAL APPORTIONMENTS

1ST	85,000 MT	73%
2ND	26,500 MT	23%
3RD	5,545 MT	4%
TOTAL	117,045 MT	

RESERVES

RESERVES OF 20,655 MT TO BE APPORTIONED AS ABOVE, ~~78%~~ 77% TO FIRST AND THIRD TRIMESTERS, ~~22%~~ 23% TO SECOND TRIMESTER.

ROLLOVERS

EXCESS COD TAC ROLLS FROM FIRST TO THIRD TRIMESTER.

LONGLINER REQUEST FOR 1997 BSAI HALIBUT PSC APPORTIONMENT

COD	840 MT
TURBOT	60 MT
TOTAL	900 MT

SEASONAL APPORTIONMENT, BSAI COD HALIBUT PSC

1ST	495 MT
2ND	40 MT
3RD	305 MT
TOTAL	840 MT

ROLLOVER

EXCESS HALIBUT PSC ROLLS FROM FIRST TO THIRD TRIMESTER.

NPLA REQUEST, COD AND TURBOT SEASON OPENINGS (REDUCE HALIBUT)

BSAI COD "B" SEASON OPENS SEPTEMBER 15 (NOW SEPTEMBER 1).

BSAI TURBOT SEASON OPENS APRIL 1 OR APRIL 15 (NOW MAY 1).

1997 BSAI TURBOT TAC - 10,000 MT

FIN

nice

AGENDA D-1
DECEMBER 1996
Supplemental

Dec. 3, 1996 D1e,f

Mr. Rick Lauber, Chairman
Dr. Clarence Pautzke, Executive Director
North Pacific Fishery Management Council
Post Office Box 103136
Anchorage, Alaska 99510

Re: Russian Zone Pollock Fishing

Dear Clarence,

During the panel discussion of the GreenPeace campaign to ban factory trawlers at the UW School of Marine Affairs seminar, there was a question raised as to what the council could do about the "loosely" (un)regulated pollock fishery on the convention line. In response to the question i suggested that the situation was analogous to the donut hole fishery and that the council could take actions similar to those regulating at least the activities of US vessels with permits to fish in our EEZ. The Donut hole regulations are as follows:

679.7 Prohibitions - section (a) -

(8) Fishing in Donut Hole. Except as authorized by permit issued pursuant to the section of the Donut Hole Convention implementing legislation authorizing NMFS to issue Donut Hole fishing permits (Public Law 104-43, section 104(d)), it is unlawful for any person to:

(i) Fish in the Donut Hole from a vessel for which a Federal fisheries permit has been issued pursuant to 679.4 during the year for which the permit was issued.

(ii) Possess within the EEZ fish harvested from the Donut Hole on board a vessel for which a Federal fisheries permit has been issued pursuant to 679.4 during the year for which the permit was issued.

The new SAFE document for the BSAI shows that we are in jeopardy of having the pollock ABC reduced to 650,000 MT in 1998, as a result of poor recruitment of 93, 94 and 95 year classes. The intense fishery on the Russian side of the convention line is clearly impacting the EBS pollock stocks, particularly when they are 2 and 3 years old. It is critical that this extra layer of exploitation of our EBS pollock be constrained as soon as possible if our industry is to survive.

As such, it is untenable that companies which are fishing in our zone are contributing to the potential destruction of our fishery. The council should take immediate steps to restrict access to pollock in our zone to any vessels of companies which are fishing in the eastern portion of the Russian EEZ on EBS pollock stocks.

At a minimum, no US vessel should be granted a permit to fish in our EEZ if they are fishing in the eastern Russian pollock fishery near the convention line. Additionally, no US vessel operated by a company with other vessels fishing in that area should be granted a permit to fish in our EEZ unless they provide the observer data, of a quality equal to our own observer program, from their Russian operations to our fisheries scientists.

Sincerely yours,

david fraser
F/V Muir Milach
P.O. Box 771
Port Townsend, Washington

Janet Smoker
D-1 ef

SUMMARY OF FIS PRESENTATION
HOOK-AND-LINE HALIBUT MORTALITY RATES IN BSAI PACIFIC COD FISHERY

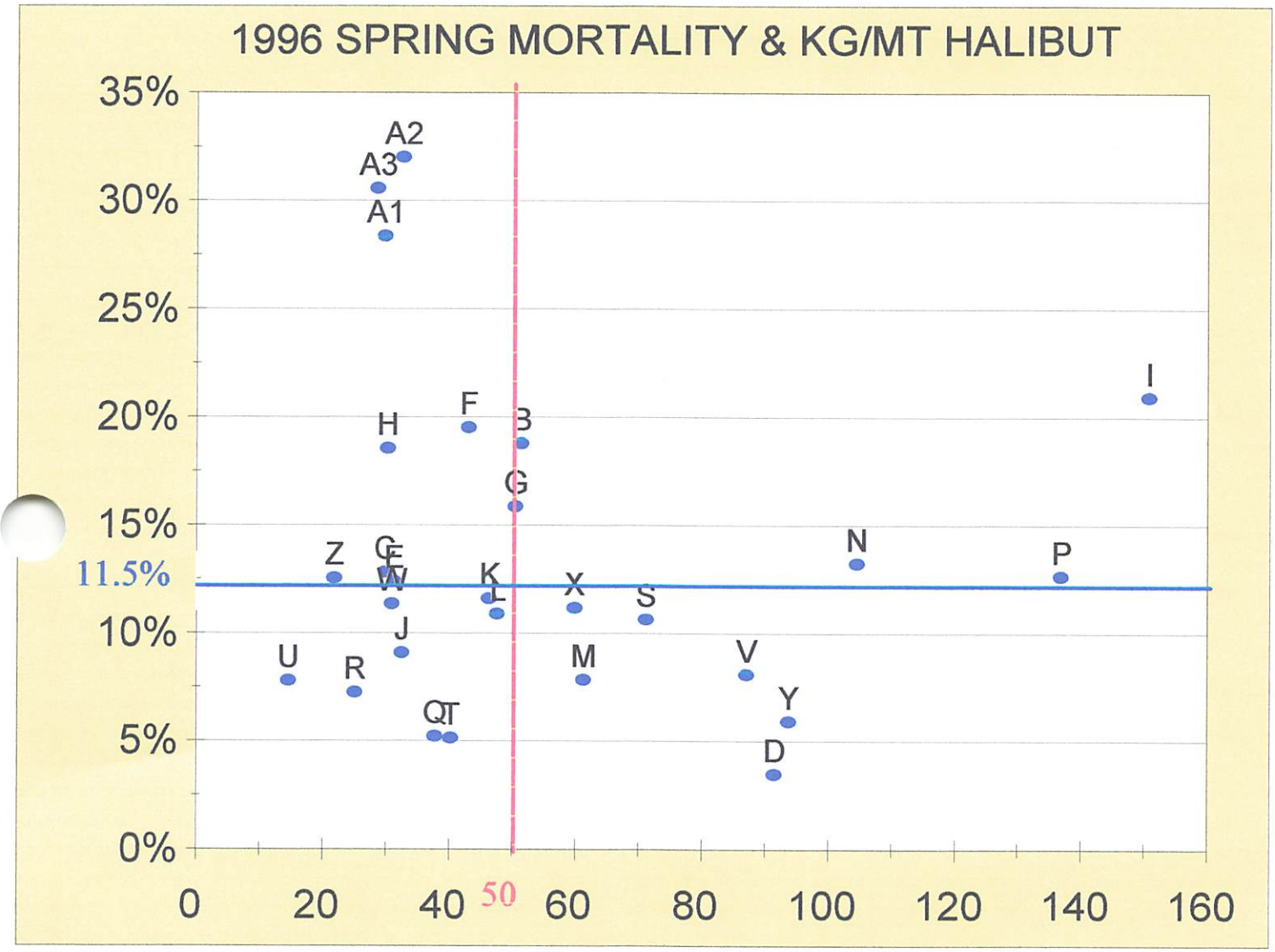
1. FIS INDUSTRY PROGRAM HAS FOCUSED ON HALIBUT MORTALITY FOR 2 YEARS.

2. DISCONNECTION OF BYCATCH RATES AND MORTALITY UNDERMINES PEER PRESSURE FOCUS, AS WELL AS PRODUCING SKEWED RESULTS UNDER OLD MODEL.

3. NEW IPHC MODEL ACCOUNTS FOR BOTH. HOWEVER 1995 DATA USED IN MODEL IS INAPPROPRIATE.

4. 1995 FALL SEASON WAS ATYPICAL. 1996 FALL SEASON WAS GREATLY IMPROVED AND ITS DATA SHOULD BE CONSIDERED.

09-Dec-96	SPRING 95 (NORPAC DATA)		FALL 95 (NORPAC DATA)		SPRING 96 (INSEASON DATA)		FALL 96 (INSEASON DATA)	
OLD MODEL		yes		yes		yes		yes
FIS PARTICIPANTS	12.9%	20	16.3%	28	13.8%	26	9.4%	25
NON-PART	16.6%	11	28.2%	4	13.6%	6	11.0%	5
FIS TOTAL EST.	13.8%	31	18.7%	32	13.8%	32	9.7%	30
IPHC MODIFICATION	11.5%		NOT DONE		NOT DONE		NOT DONE	
NEW IPHC MODEL	12.4%		17.4%		NOT DONE		NOT DONE	


1996 SPRING MORTALITY & KG/MT HALIBUT
35%
30%
25%
20%
15%
11.5%
10%
5%
0%
0
20
40
50
60
80
100
120
140
160
A2
A3
A1
H
F
B
G
I
N
P
Z
C
E
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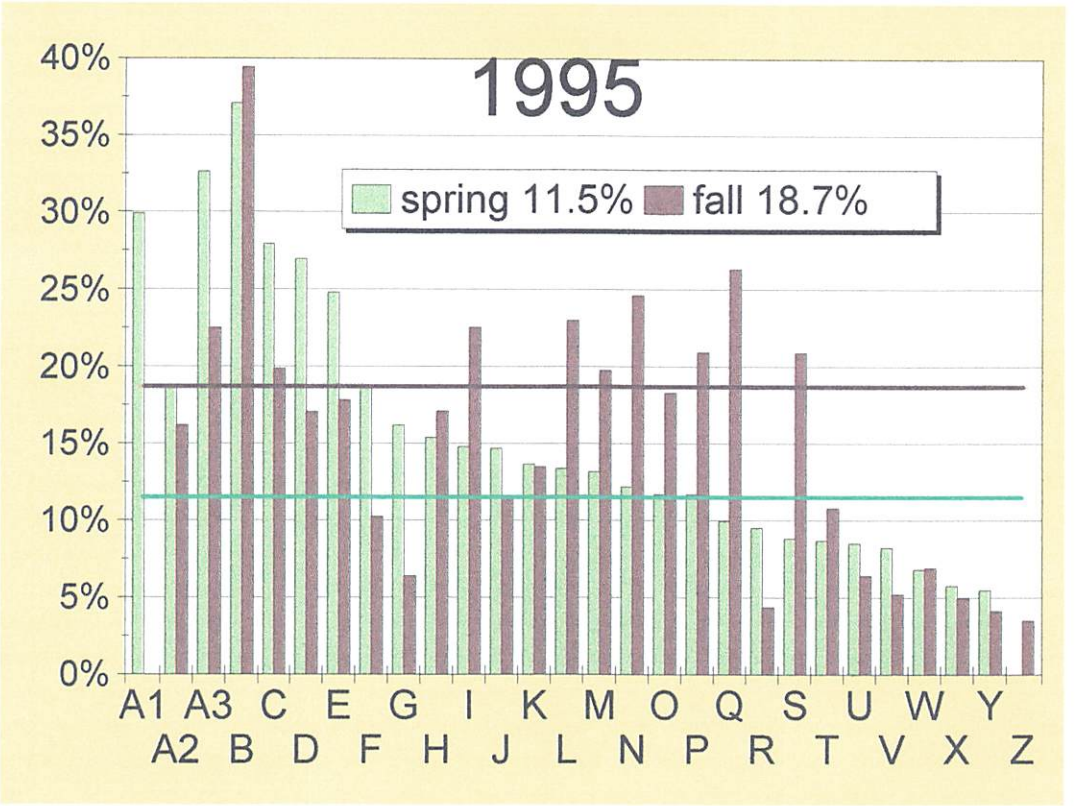
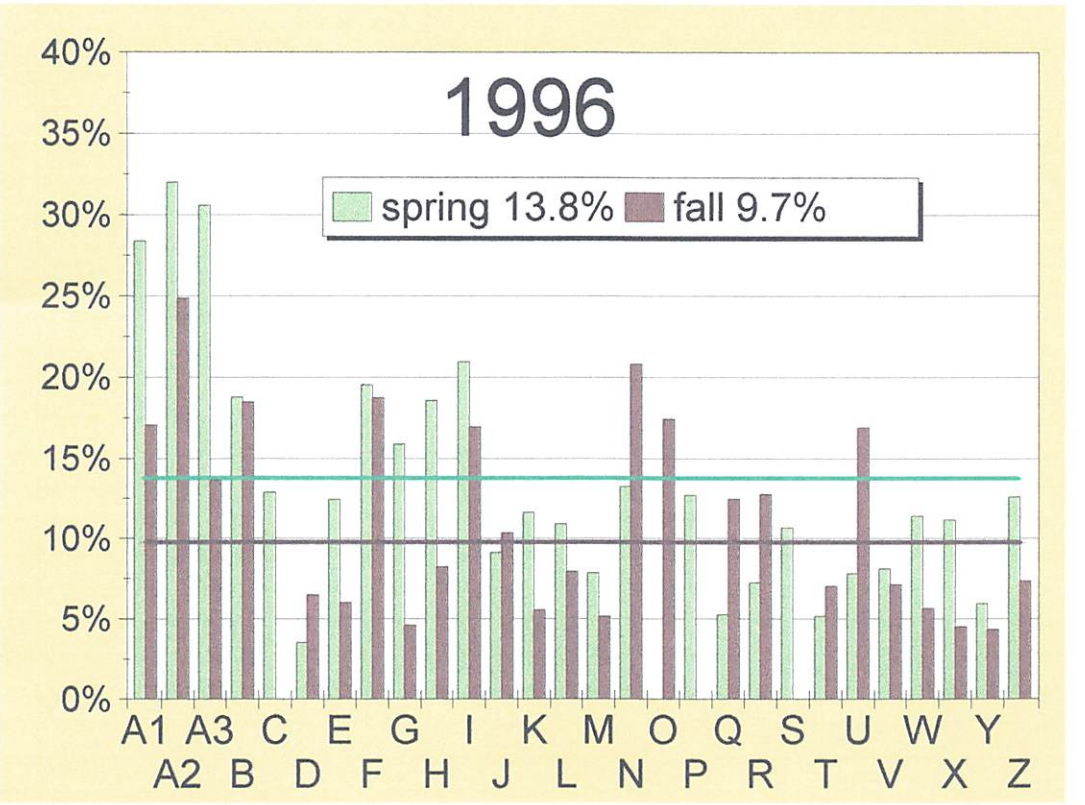
HALIBUT MORTALITY IN H&L COD FISHERIES





Steve Hughes
Brent Paine
D-1ef
BSAI

Date: Tuesday, November 26, 1996 6:40:36 PM
From: Vidar_Wespestad@racesmtp.afsc.noaa.gov (Vidar Wespestad)
Subj: Pass to Hughes
To: JAJfish@aol.com

Here's the biomass distribution from triennial surveys that I received from Gary Walters

POLLOCK BIOMASS FROM TRIENNIAL SURVEYS

1982	Standard shelf	2,989,000 mt	3,292,000
	North shelf	98,000	303,000 / 3,292,000 = 9.2%
	Slope	205,000	
1985	Standard shelf	4,650,000	6,429,000
	North shelf	1,699,000	1,779,000 / 6,429,000 = 27.7%
	Slope	80,000	
1988	Standard shelf	6,922,000	7,511,000
	North shelf	458,000	589,000 / 7,511,000 = 7.8%
	Slope	131,000	
1991	Standard shelf	5,109,000	5,363,000
	North shelf	181,000	254,000 / 5,363,000 = 4.7%
	Slope	73,000	
1994	Standard shelf	4,977,000	
	North shelf	56,000	(Western 1/3 surveyed only)
	Slope		(Not surveyed)

---------- Headers ----------
From Vidar_Wespestad@racesmtp.afsc.noaa.gov Tue Nov 26 13:39:59 1996
Return-Path: Vidar_Wespestad@racesmtp.afsc.noaa.gov
Received: from racesmtp.afsc.noaa.gov (racesmtp.afsc.noaa.gov [161.55.96.3]) by emin20.mail.aol.com (8.6.12/8.6.12) with SMTP id NAA13009 for <JAJfish@aol.com>; Tue, 26 Nov 1996 13:39:58 -0500
Received: from RACE-Message_Server by racesmtp.afsc.noaa.gov with Novell_GroupWise; Tue, 26 Nov 1996 10:42:58 -0800
Message-Id: <s29ac9b2.033@racesmtp.afsc.noaa.gov>
X-Mailer: Novell GroupWise 4.1
e: Tue, 26 Nov 1996 10:39:12 -0800

UNIFIED TRAWL INDUSTRY

BSAI

Brent Paine
Steve Hughes
D-1ef

Recommended ABCs and TACs for 1997 BSAI Groundfish Fisheries						
Species	Area	Seasons	TAC 1996 Council	ABC 1996 Council	ABC 1997 Plan Team	**TAC 1997 Industry Rec.**
Pollock	EBS		1,190,000	1,190,000	1,130,000	**1,130,000**
		Roe	45%			
		Non-roe	55%			
	AI		35,600	35,600	28,000	**28,000**
	Bogoslof		1,000	121,000	115,000	**1,000**
Pacific Cod	BS/AI		270,000	305,000	306,000	**275,000**
Yellowfin Sole			200,000	278,000	233,000	**230,000**
Greenland Turbot			7,000	10,300	16,800	**9,000**
Arrowtooth Flounder			9,000	129,000	108,000	**15,000**
Rock Sole			70,000	361,000	296,000	**97,185**
Flathead Sole			30,000	116,000	101,000	**43,500**
Other Flatfish			35,000	102,000	97,500	**50,750**
Sablefish	EBS		1,100	1,200	1,500	**1,500**
	AI		1,200	1,300	1,560	**1,560**
POP Complex						
True POP	EBS		1,800	1,800	2,800	**2,800**
Other red rockfish	EBS		1,260	1,400	1,050	**1,050**
True POP	AI		12,100	12,100	12,800	**12,800**
Sharp/Northern	AI		5,229	5,810	4,360	**4,360**
Short/Rougheye	AI		1,125	1,250	938	**938**
Other Rockfish	EBS		497	497	373	**373**
	AI		952	952	714	**714**
Atka Mackerel			106,157	116,000	66,700	**66,700**
Squid			1,000	3,000	1,970	**1,970**
Other Speces			21,125	27,600	25,800	**25,800**
Total			2,001,145	2,820,809	2,551,865	**2,000,000**

AP REC.

270,000

20,760

1,100

1,200

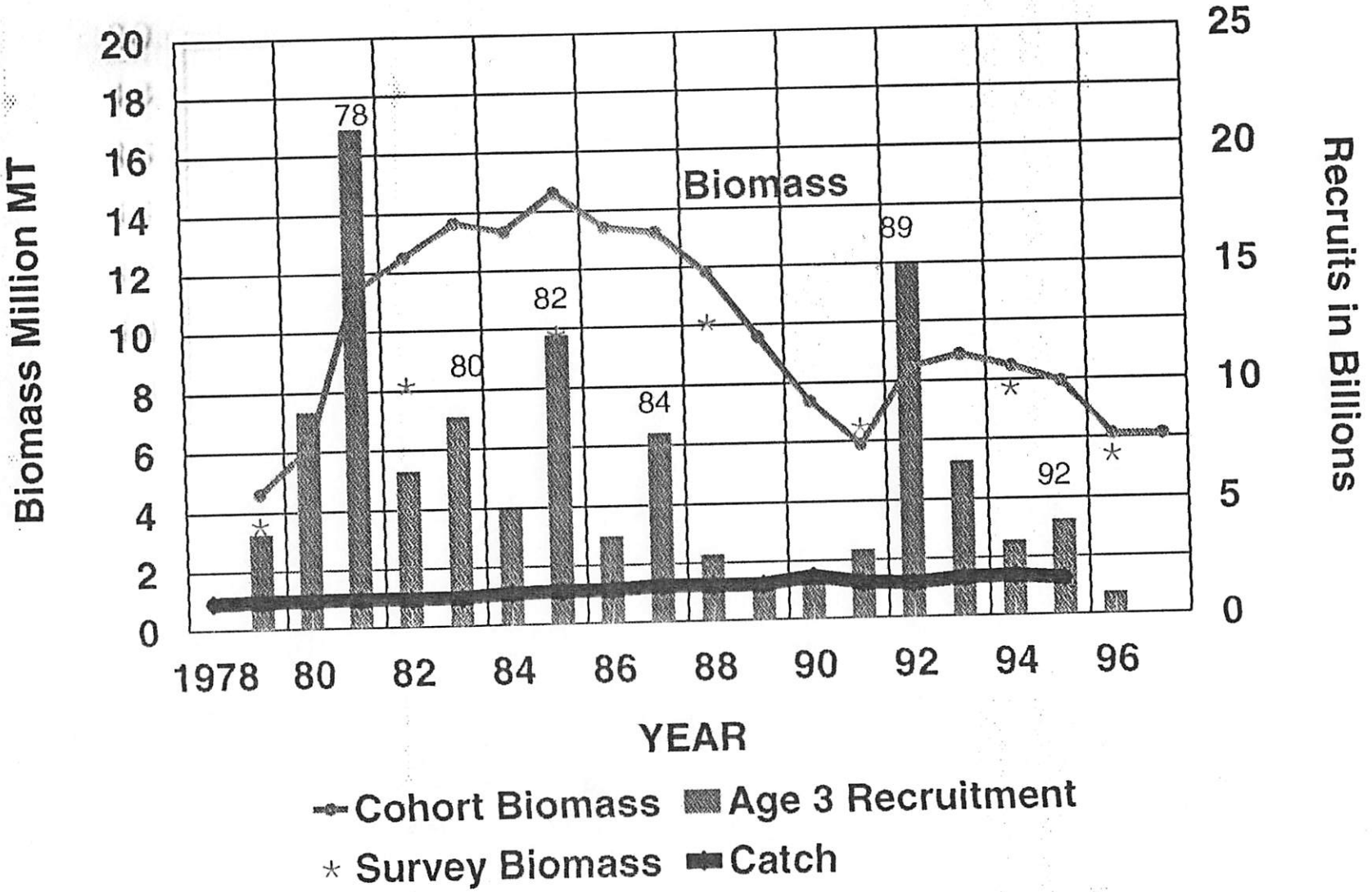
Draft Industry Proposed PSC Apportionments for 1997 BSAI Trawl Fisheries

Fishery Group	Assumed Mortality		Halibut Mortality Cap (mt)	Herring mt	Red King Crab (# of Animals)	Bairdi	Bairdi	Opilio
	1996	1997 Rec.			Zone 1	Zone 1	Zone 2	
Yellowfin Sole	73%	79%	930		10,000	276,316	1,071,000	
Jan 20 - Mar 31			210					
Apr 1 - May 10			210					
May 11 - Aug 14			100					
Aug 15 - Dec 31			410					
Rocksole/Other Flatfish	73%	73%	795		75,000	296,052	357,000	
Jan. 20-March 29			485					
March 30-June 28			130					
June 29-Dec. 31			180					
Arrowtooth/Sablefish	49%	23%	0					
Turbot	49%	66%	0					
Rockfish	75%	72%	100				7,000	
Jan. 20-March 31			30					
May 1 - June 30			45					
July 1 - Dec. 31			25				195,000	
Pacific Cod	63%	68%	1,600		7,500	133,224		
Jan. 20-			1,600					
Pollock/Mackerel/"O" Species	88%	79%	350		7,500	44,408	470,000	
Jan. 20-April 15			300					
April 15-Dec. 31			50					
Other Species	82%	68%	0					
MW Pollock (Herring only)			0					
Total			3,775		100,000	750,000	2,100,000	

Should be Correct per Cruz PSC

Vince Curry
D-1

Eastern Bering Sea Pollock
Biomass and Age 3 Recruitment 1978-97

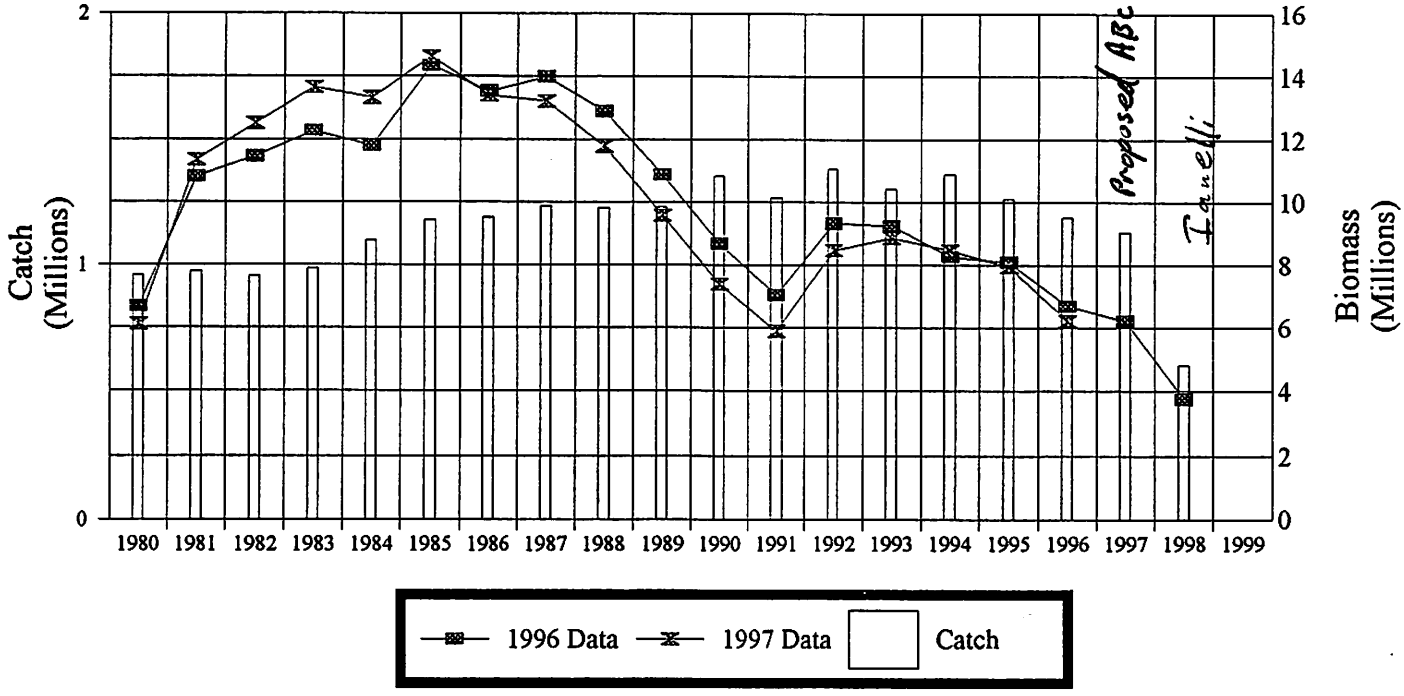


D-1 cf

Paul Seaton
D-1ef

Eastern Bering Sea Pollock

Biomass & Catch in million metric tons



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ADELAIDE • AMSTERDAM • ANCHORAGE • AUCKLAND • BOSTON • BRUSSELS • BUENOS AIRES • CHICAGO • COPENHAGEN • DUBLIN
FORT LAUDERDALE • GOTHENBERG • HAMBURG • LEWES — U.K. • LONDON • LUXEMBOURG • MADRID • MONTREAL • OSLO • PALMA DE MALLORCA
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GREENPEACE

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• Fax (206) 632-6122 •

Richard Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, AK 99510

12/4/96
VIA FAX

RE: Groundfish specifications for Bering Sea/Aleutian Islands pollock for 1997.

Mr. Chairman:

On behalf of Greenpeace, we are submitting the following comments for consideration at the Council's December, 1996 meeting at which time the final Bering Sea/Aleutian Islands pollock catch levels will be set for 1997.

Greenpeace has long maintained that the high-volume pollock fishery has in the past and continues to distort and alter the North Pacific ecosystem, and should be reduced to a lower level of exploitation for that reason. We do not believe that the currently recommended BS/AI pollock ABC/TAC of 1.1 million metric tons is sufficiently conservative to meet the needs of other species. Additionally, it poses the risk of a serious stock depletion and steep reductions in catch after 1997.

Based on the data from the 1996 EBS pollock survey, the stock (age 3+) is down 50% or more from the mid-1980s. The virtual absence of age 1-2 pollock in the survey indicates the likelihood of poor recruitment into the fishery in the near future. The BS/AI Plan Team meetings of Nov. 18-21 acknowledged these concerns but ultimately concluded that next year's EBS pollock survey should clarify the situation with regards to recruitment beyond 1997. Until then, the Plan Team recommends a pollock ABC and TAC at the 31-year average of 1.1 million metric tons.

Greenpeace takes the opposite view: until the results from next year's survey are known, the Council should take a more risk-averse approach and reduce next year's catch quota. The declining biomass of the stock and the prospect of continuing poor recruitment, combined with continued low abundance of the Aleutian Basin/ Bogoslof Island stock, dictate a more conservative harvest strategy for 1997. Optimistic recruitment predictions beyond 1997 are nothing more than computer modelling exercises using a 17-year data series, and should be regarded as placeholders having very limited predictive value.

A reduction in catch for 1997 will serve important short-term goals by aiding in (1) mitigating future potential food web impacts resulting from low pollock biomass, (2) conserving the exploitable biomass in order to reduce the risk of severe stock depletion, (3) allowing more time to assess next year's survey data on future recruitment trends, and (4) easing the transition in the industry to lower catch levels based on what is known about current recruitment trends. In short, the Council should hedge its bets in the face of declining pollock trends and uncertainty about the future rather than waiting for the stock to crash before attempting to mitigate the damage.

The survey data and alternative model forecast (AFSC/NMFS, 1996) suggest that a failure to reduce catches now may require even steeper cuts in 1998. But while the potential for a sharp drop in pollock abundance is a threat to the overcapitalized pollock fishery, it poses an even greater threat to already depleted marine mammal and bird populations which rely on pollock. The widespread decline in top pollock predators should serve as a warning sign of an over-exploited ecosystem which can no longer support these wildlife species at their historical levels of abundance. In the words of the recent National Research Council report on the Bering Sea:

> "It seems extremely unlikely that the productivity of the Bering Sea ecosystem can sustain current rates of human exploitation as well as the large populations of all marine mammals and bird species that existed before human exploitation -- especially modern exploitation -- began."

In other words, unless exploitation of key prey species such as pollock is reduced, the recovery of depleted or endangered species appears unlikely. This is a key point which underlies our concern that the North Pacific is being over-exploited, despite the protestations of the Fisheries Service and North Pacific Council to the contrary.

RECOMMENDATIONS

In the interest of protecting pollock predators and ecosystem processes, as well as maintaining the long-term viability of the fishery, Greenpeace recommends a 35-40% reduction in the BS/AI pollock TAC for 1997. In addition, we are recommending that the Aleutian Islands allocation be designated as a bycatch-only fishery.

We believe a 35-40% reduction in the TAC is prudent from the point of view of the fishery alone, given the current declining status and poor recruitment of the stock. If recruitment indicators do not improve significantly, and if the stock continues to decline through 1997, the risk of a severe stock depletion would increase substantially. As a consequence, the Plan Team speculates that the 1998 TAC could drop to under 700,000 metric tons. A 35-40%

reduction the 1997 TAC arrives at the 700,000 ton threshold a year early. We believe this is a wise precaution which may avoid a much more drastic reduction in 1998 and beyond.

This number should not be regarded as a magic bullet that will ensure a "sustainable" level of exploitation in the context of the ecosystem. Rather, 35-40% is a first step toward the goal of allowing pollock stocks to recover a high proportion of their biomass that would occur in the absence of fishing in order to ensure that the pollock food web is not compromised. Given that pollock abundance fluctuates and that successful recruitment depends on numerous environmental variables which change from year to year, the catch level which achieves the goal of maintaining a higher percentage of spawning biomass will also vary.

Furthermore, there is compelling reason to believe that reductions in the "A" season roe fishery are likely to provide multiple benefits to pollock predators such as the endangered Steller sea lion and other marine mammals and birds which breed in Alaska. Greenpeace is particularly concerned that the heavy concentration of fishing pressure on spawning pollock in the eastern Bering Sea "A" season may be depleting local areas of spawning pollock and depriving pregnant sea lions and weaned pups of a rich, concentrated, easily obtained food source in the critical winter months. Sea lions are known to forage far out at sea in winter, and readily available aggregations of energy-rich spawning pollock may be crucial to the reproductive success of females and perhaps to the survival of weaned juveniles. Depletions of this important food source may cause food-stressed females to abort fetuses or wean nursing pups before they are able to feed themselves (Lavigne and National Marine Mammal Lab, 1991).

In addition, past studies of kittiwake and murre reproductive success on the Pribilof Islands show strong correlations with the abundance of age 0-1 pollock in the eastern Bering Sea (Springer et al, 1986). Removal of large quantities of spawning pollock on the eastern Bering Sea shelf may be depriving these marine birds of young pollock prey that would otherwise have been produced earlier in the year. Studies have demonstrated that declines in kittiwake and murre populations on the Pribilofs since the 1970s have occurred in years of low availability of juvenile (<15 cm) pollock.

Current management of EBS pollock focuses on maximizing recruitment to the exploitable biomass rather than on maximizing the spawner biomass or the consistency of year class production for the ecosystem. Reduced availability of age 0-1 pollock to seabirds and reproductive failures in the Pribilofs are but one example of the possible consequences of this management policy. The potential of overfishing and dangerously depleting the spawning stock is another, since reducing the spawning stock biomass is the intended outcome of this policy. We believe that risk is high today.

For all of the above reasons, Greenpeace recommends that a sizeable

proportion of the 35-40% reduction in TAC come from the pollock roe fishery.

SPATIAL COMPRESSION OF THE BS/AI POLLOCK FISHERY

Although the annual eastern Bering Sea/Aleutian Island pollock allocation has remained fairly constant in the post-Magnuson Act era, there is a disturbing trend toward increasing concentration of fishing pressure and catch on the southeastern Bering Sea shelf in areas to the east and northeast of Area 518. The catch quota has remained high throughout the 1990s but has been extracted from a smaller and smaller area.

Upon closure of the Bogoslof pollock fishery (Area 518) in 1992, the pollock TAC remained constant -- meaning that the pollock harvest was effectively increased by 200,000 metric tons on the EBS shelf. Since 1991, pollock catch in the management areas 521 and 522 have declined steadily from over 500,000 metric tons (45% of TAC) to less than 100,000 tons (7%) in 1995 and 1996. Meanwhile harvests from the southeastern Bering Sea have risen from 654,000 metric tons (55% of TAC) to over 1.1 million metric tons (93%) in 1995 and 1996.

In effect, the southeastern Bering Sea has experienced an almost 50% increase in pollock TAC since 1991. We believe that this intensified fishing pressure in a shrinking area and over a short period of time is likely to have highly adverse ecosystem impacts which neither the Council nor the Fisheries Service has addressed, although NMFS has acknowledged that spatial and temporal compression of the BS/AI pollock fishery during the 1980s and 1990s may be contributing to and exacerbating the decline of the Steller sea lion population. Pollock catch in Steller foraging areas of the eastern Bering Sea soared from the 1980s to the early 1990s:

> "Estimated removals of pollock from Steller sea lion critical habitat in the BS/AI region have increased from between 250,000 and 300,000 t in 1981-1986 (between 20-30% of total BSAI pollock landings) to between 410,000 and 680,000 t in 1987-1993 (between 35-53% of total BSAI pollock landings). Much of this increase in pollock landings from critical habitat came from the EBS foraging area..."(AFSC, 1995).

Spatial compression of the fishery in the eastern Bering Sea has intensified into the present. There is no longer anywhere else to fish profitably for pollock and no way to spread out the fishing pressure and the catch except by reducing the BS/AI catch significantly.

MSY FOR EASTERN BERING SEA POLLOCK

Management claims for sustainability of marine fisheries resources typically mean some level of continued, steady commodity production

from individual species (Meyer and Helfman, 1993). The definition of overfishing in this context is "a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock to produce maximum sustainable yield on a continuing basis." (NPFMC, Draft 1997 Ecosystem Considerations)

Single-species management of pollock under MSY rests on the assumption that the stock can be fished down to half of its unfished "equilibrium population" in order to achieve maximum yield of new recruits to the fishery (Quinn and Collie, 1990). Based on Quinn and Collie's CAGEAN model, the biomass of pollock spawners which produces MSY is 6 million metric tons -- about where the Plan Team estimates age 3+ pollock abundance to be today. According to the model, in the absence of fishing the stock biomass would stabilize at about 12 million tons on average. Even if pollock can withstand this level of exploitation indefinitely (30 years), that does not mean the Bering Sea ecosystem can.

MSY estimates under current management of EBS pollock focus on maximizing recruitment to the exploitable biomass rather than on maximizing the spawner biomass or the consistency of year class production for the ecosystem.In order to minimize the risk of depleting or irreversibly altering the food web, Greenpeace believes that target stocks such as pollock should be maintained at a higher percentage of their estimated unfished biomass.

Additionally, MSY spawner-recruit estimates for pollock are gross oversimplifications and presume a greater ability to predict and control the population dynamics of the stock than actually exists. Generalizations about spawner biomass and recruitment are very different from knowing the actual quantity of spawners which will produce optimal year classes of pollock:

> "After many decades of intensive research on stock-recruitment problems, we now know that no simple relation exists between the size of the spawning stock and the amount of recruitment to an exploitable stock. It can only be stated in general terms that proportionally larger recruitment can result from a small spawning stock and proportionally smaller recruitment can result from a large spawning stock." (Laevastu and Favorite)

MSY gives fisheries scientists and managers the illusion of certainty that the current declining pollock abundance and recruitment trends will be reversed by large year classes and justifies unsustainably high harvest levels on the expectation of optimistic recruitment predictions for the future.

It is probably impossible to know what MSY for an individual stock is until it has been exceeded (Hilborn and Walters, 1992). Even supposing it is true that a lower spawner biomass may produce higher recruitment, MSY management greatly increases the risk of stock collapse and offers no guarantee that big year classes will actually result. A larger spawning stock may dampen

recruitment but poses no such risk of stock collapse or potential ecosystem damage.

ECOSYSTEM CONSIDERATIONS

Catch quotas for important prey fish need to be more conservative because abundance of these species varies naturally, and the ecosystem effects of natural fluctuations in abundance will be magnified by high-volume fishing.

Given the nodal position of pollock in the Bering Sea food web, we believe it is probable that current estimates of pollock predation are not adequately reflected in estimates of natural mortality. In addition to fish, pinnipeds and marine birds, pollock are preyed upon by some baleen whales (fin, sei, minke and humpback) as well as Dall's porpoises, and may be seasonally important for beluga whales, harbor porpoises and killer whales (Lowry et al, 1988).

The uplisting of the western Alaska Steller sea lion stock from "threatened" to "endangered" ought to be a signal to the Fisheries Service and the Council alike that current single-species management of the North Pacific pollock fisheries is unsustainable in an ecosystem context. Fishery effects on food availability are thought to be the only factor with a high likelihood of explaining the widespread and persistent declines of the Steller sea lion (NRC, 1996). Only by reducing pressure on sea lion prey are we likely to reverse their declines or the declines of other major pollock predators at the top of the food chain which are indicators of the integrity of the ecosystem processes which sustain them.

In addition to Steller sea lions, there have been large declines (50%) of fur seals since the 1970s which may be attributable to food shortages (Trites, 1990). Steep declines (85%) of harbor seals (Phoca vitulina richardsi) at Tugidak Island from 1977-88 occurred during and after the intensive trawl fishery for spawning pollock around Kodiak Island (Pitcher, 1990). Harbor seals counts are now declining in the Bristol Bay region, and the species is believed to have experienced an overall decline of 40% since the 1960s (NMFS, 1996). In Southeast Alaska, where there has been no extensive trawl fishery, there no similar instances of large declines either in sea lion or harbor seal populations.

Marine bird populations which rely on annual juvenile pollock availability for their reproductive success include black-legged kittiwakes and common and thick-billed murres, which have also declined since the 1970s in the principal area of study in the Pribilof Islands. Other pollock-eating seabirds known to be in decline include the red-legged kittiwake and three species of murrelet. Tufted and horned puffins, parakeet auklets and pelagic cormorants are also known pollock predators.

CONCLUSIONS

Greenpeace believes that the BS/AI pollock TAC reduction of 35-40% for 1997 is justified from the perspective of the fishery data, quite aside from our concerns about overfishing in an ecosystem context. The most recent Bering Sea pollock survey indicates a stock in trouble. A 1.1 million metric ton TAC is justified only on the assumption that a big year class will appear in 1998 to replenish the stock, yet there is precious little evidence to justify this optimism.

The steady downward trend in pollock abundance has come at the same time that fishing effort on the southeastern Bering Sea shelf has increased dramatically. Catch in that area has increased nearly 50% and has rapidly diminished the remainder of the older cohorts from the large '89 year class. Although a 35-40% reduction in the TAC will not achieve long-term sustainability and may not be sufficient to reverse declining trends in numbers of pollock predators throughout this region, it is a first step in the direction of a change in management that attempts to manage for the needs of the entire ecosystem. It may mitigate the worst effects of stock decline and it will immediately relieve some of the fishing pressure on the southeastern Bering Sea, as well as minimize the risk of a spawning stock crash in the near future.

Ultimately the North Pacific Council must reject flawed single-species management assumptions which we believe have precipitated this situation. The Council should adopt a precautionary, ecosystem-based management approach to the pollock fishery which maintains pollock spawner biomass nearer levels that would occur in the absence of fishing. The Council should acknowledge the importance of scientific data in the management of fisheries while recognizing its limitations. Science can neither prove that current pollock exploitation causes no harm to the ecosystem nor disprove our assertion that it is causing harm. In the face of formidable uncertainties, a precautionary and risk-averse harvest strategy recognizes how little we understand about the North Pacific ecosystem. Most importantly, it is a means of preventing damage rather than attempting to mitigate it after the fact.

Sincerely,

Fred Munson
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> "There are no major known natural environmental shifts which may have contributed to the decline [of Steller sea lions]. Northern fur seals, harbor seals, and some seabirds have also declined significantly, and all depend heavily on pollock."

And:

> "The February to April pollock roe fishery occurs at a time of presumed sensitivity for pregnant sea lions and weaned pups. This is a period of high energy demand for the females, and it coincides with poor weather and reduced space to haul out on land. REMOVAL OF LARGE QUANTITIES OF ENERGY-RICH SPAWNING FISH MAY COMPROMISE THE HEALTH OF PREGNANT FEMALES, THEIR FETUS, OR FORCE THEM TO WEAN THEIR PUPS BEFORE THE PUP CAN FEED ON ITS OWN."

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