

MEMORANDUM

TO: Council, SSC, and AP Members

FROM: Jim H. Branson  
Executive Director

DATE: July 18, 1983

SUBJECT: Groundfish in the Gulf of Alaska

**ACTION REQUIRED**

1. The Council should re-appraise the possibility of increasing the pollock OY in the Central Regulatory Area for 1983.
2. The Council should appoint Council and AP members to the Prohibited Species Phase II Workgroup.

*Marasco will give report on Phase I*  
*Reps 2 Gary Stauffer*

**BACKGROUND**

1. At the May meeting the Council considered a request from the Japan Deep Sea Trawlers Association to increase the pollock OY in the Central Gulf in order to maintain their fishery at the 1982 level. The pollock TALFF has been reduced due to the successful joint venture catches in Shelikof Strait. An OY increase of 40,000 mt (from 143,000 mt to 183,000 mt) would satisfy the needs of the foreign fishery for pollock. The Council did not change the OY in May, due, in part, to the unavailability of information on the current status of stocks.

New information on the pollock resource may be available at this meeting. Gary Stauffer of the Northwest and Alaska Fisheries Center should be able to report on the preliminary results from the age structure analysis of the fishery statistics through 1982 and NMFS resource surveys conducted during the 1983 spring spawning surveys. This updated information should be useful in further consideration of the 1983-84 pollock OY.

2. At the December 1982 meeting the Council established a workgroup to study the by-catch of prohibited species by foreign fisheries in the Gulf of Alaska. The group's work was organized into two phases. Phase I was to examine the nature and scope of the problem and quality of the available data. Phase II was to be devoted to the development of options to control the prohibited species by-catch and an analysis of the impacts, benefits, and costs of the options.

The Phase I working group met on January 27 to make work assignments and on June 29 to discuss the reports which have been developed. A compilation of those reports should be available shortly after this meeting. Rich Marasco will present a summary of the Phase I reports.

If the Council decides to continue with Phase II, Council members and AP members should be assigned to the working group to assist in the group's task. Council and AP members currently assigned to the Gulf of Alaska Groundfish subgroups are as follows:-

Council - John Harville  
Don Collinsworth

AP - Robert Alverson  
Alvin Burch  
Richard Goldsmith  
Jack Phillips

3. At the June 28, 1983 PMT meeting, Phil Chitwood reported on the problem of sablefish catch reports in the East Yakutat and Southeast management districts. Currently the State of Alaska reporting area in the Cape Spencer area is intersected by the line between the FMP districts at 137°W. longitude. Fishermen report by State area and not by FMP district, therefore it is not possible to separate the catch from the East Yakutat and Southeast areas.

A review of historical foreign sablefish catches revealed that most sablefish caught in East Yakutat came from the overlap area, along the 100 fathom line. Agenda item D-5(a) shows these areas.

Because catches from this area cannot be assigned to either East Yakutat or Southeast, NMFS would like to manage these areas as one management district and combine the OYs. The combined OYs will total a range of 1,320 mt to 2,570 mt. The sablefish catch from these areas as of July 18 is about 1,800 mt.

The PMT would like more time to develop an amendment to the FMP to solve the problem. The Team will try and prepare an amendment package for Council review for the September meeting.

4. On July 7 and 8 Gary Stauffer of the Northwest and Alaska Fisheries Center attended a sablefish research needs and planning meeting in Tiburon, California. He will report on the results of the meeting so that the SSC can determine sablefish research priorities for the North Pacific area.



PROGRESS REPORT ON THE STATUS OF POLLOCK  
IN THE GULF OF ALASKA, JULY 1983

By Dr. Gary D. Stauffer  
NMFS-NWAFC and  
GOA Groundfish PMT  
Seattle, WA  
July 25, 1983

Council staff asked the Northwest and Alaska Fisheries Center (NWAFC) to provide an update for the July meeting on the analysis of the status of the pollock stocks to reconsider an increase of 40,000 t in pollock OY in the central area of the Gulf of Alaska for 1983. As a member of the NWAFC staff and the Gulf of Alaska Groundfish PMT, I have prepared the following update based on the progress of the analysis of the 1983 NMFS surveys in Shelikof Straits and commercial fishery statistics.

AGE STRUCTURE ANALYSIS

Early results from the ongoing cohort analysis incorporating the 1982 age composition data for the foreign and joint venture fishery suggests that the 1977, 1978, and 1979 year classes are of similar magnitude to the 1975 and 1976 year classes, and that the annual pollock abundance has not changed much since 1980. The addition of the 1982 data to the analysis did not improve the precision of the estimates as anticipated. Apparently the fish within the age groups 7, 8, 9, and 10 from the 1975, 1974, 1973, and 1972 year classes respectively occurred infrequently in the 1982 catch samples compared to the earlier years. As a result the assumption of constant age selectivity coefficients from year to year must be modified in order to apply Alton and Deriso age structure model. The age compositions from the age samples processed to date for the 1983 joint venture fishery and the NMFS surveys have a more normal percentage of these older year classes suggesting that the low occurrence of the older ages in the 1982 fishery samples may not persist. One alternative for modifying the above assumption is to allow the age selectivity coefficients for the 7-10 age groups in 1982 to be estimated separately. The consequence of this modification is that the advantage of the 8 new data points from 1982 in reducing the measure of error or variance about the estimates is counterbalanced by the addition of the new parameters, such that we do not gain any precision. The average exploitable annual surplus production (ASP) for this alternative is nearly identical to the previous estimate of annual surplus production from Alton and Deriso. As a result our best estimate of ASP for pollock in the western and central Gulf is still 344,000 t with a range of 180,000 to 506,000 t. The attached risk analysis presented at the May Council meeting is still applicable to this current OY consideration.

NMFS SURVEY RESULTS

Estimates for the 1983 spawning biomass in the western and central Gulf derived from the NMFS acoustic and bottom trawl surveys are available.

Provisional 1983 spawning biomass from the two acoustic surveys conducted in March are 2,550,000 and 2,360,000 t. These estimates apply to the area of Shelikof Straits since only negligible quantities of pollock were found outside of Shelikof St. The 1983 biomass estimate for the bottom component within 2-3 meters of the bottom is 184,000 t for Shelikof St. or about 7% of the combined bottom and midwater total of 2.5 to 2.7 million t. This percentage is in line with what is expected based on the vertical distribution of the stock in the water column. The acoustic estimates are considerably higher than the previously reported estimates that ranged from 558,000 to 801,000 for the 1980 and 1981 acoustic surveys. This large difference lead to the reexamination of the earlier estimates in which it was found that the echosounder/transducer calibration constant, used in scaling echo integration voltages to estimates of fish density, had been inadvertently miscalculated in 1981. Based on this reexamination, the 1981 estimates for the two March surveys are now being revised upward to 4,380,000 and 3,150,000 t.

The revised 1981 acoustic biomass estimates which do not include an estimate of the bottom component are inbetween Alton and Deriso estimates of total biomass and exploitabele biomass; this iliminates our earlier concern about the discrepancy between the two methods. This agreement also adds support to the hypothesis that the Shelikof St. is the major spawning area for pollock between the Shumagin and Kodiak Island areas.

The biomass estimates for the acoustic surveys conducted during the first half of April are less than 1,000,000 t for 1980 and 1983 while the estimate for a similarly scheduled survey in 1981 is about 3,000,000 t. We suspect that the low abundance estimates for early April 1980 and 1983 compared to 1981 are related to differences in the timing of the dispersion of the pollock concentrations at the end of the spawning season.

The decline of about 1,000,000 t in the acoustic biomass estimates from 1981 to 1983 suggest that the stock has declined. The 95% confidence intervals, though, for these overlap the mean estimates which says that this difference is not statistically significant. The low percentage of the age 3 fish in the 1983 NMFS surveys and joint venture fishery provides a first indication that the 1980 year class may be weak. The 1983 foreign fishery will provide additional information on the relative abundance of the 1980 year class.

#### PRORATING OY BY AREA

The recent increase and the proposed additional 40,000 t increase in pollock OY apply to just the central Gulf. The FMP originally assigned 37% of the pollock OY to the western Gulf and 63% to the central Gulf. This was done prior to the development of the Shelikof joint venture fishery within the central area. These changes in OY have not considered prorating the increase among the two areas. The most recent survey information supports the hypothesis that the winter pollock concentration within Shelikof St. is probably the major spawning area for the western

and central Gulf. The estimates of biomass and ASP discussed above apply to the western and central area combined. The best estimate for the percentage split between the two areas is still 37-63% although in reality the proportion of the stock among the two areas probably varies annually. If a 240,000 t OY were to be prorated between the western and central regions by the 37-63% split, then the OY for the western and central areas would be 88,000 and 151,200 t respectively. With nearly all the 1983 JV harvest coming from the central area, the remaining harvest for TALFF, Reserve, and DAP combined would be about 83,000 t in the western area and 20,000 t in the central area. It is unlikely that 83,000 t would be caught in the western area. The remaining 20,000 t for the central area would not be enough to allow the foreign fisheries to continue at the harvest levels for recent years in this area, unless the 1983 JV catch of 130,677 t were also prorated over the two areas. This action would have to be based on the assumption that the Shelikof spawning concentration was the major spawning area of pollock from the western and central Gulf.

If the 1983 JV catch and the past and proposed increases in OY are assigned to the central area then the OY values are 57,000 t for the western area and 183,000 t for the central area. The TALFF, Reserve, plus DAP would be about 51,000 t for the western area and 52,000 t for the central area. This results in a 23-77% split. If the fisheries including the foreign fleets were to be allowed to harvest about 50000 t in each area, when in reality the 1983 JV catch should have been prorated between the two areas, then the actual harvest would be about 99,000 t in the western area and 134,000 t in the central. This would result in a 44-56% split. This latter case probably approximates reality if OY were to be increased as proposed.

#### INCIDENTAL HALIBUT CATCH

An incidental halibut catch equal to 0.9-1.2% of 40,000 t or 360 to 480 t can be expected from a 40,000 t increase in OY if the foreign fishery harvests most of the increase. The total incidental halibut catch by a 240,000 t pollock fishery in the Gulf should not increase much over 1982. The 1983 foreign pollock fishery would not be expected to exceed its 1982 harvest level. On the other hand, if the pollock OY is not changed then the 1983 incidental catch of halibut by the foreign trawl fleet could decrease by some 360 to 480 t over 1982.

#### CONCLUSION

The current condition of the pollock resource in the western and central Gulf is strong. The 1977, 1978, and 1979 year classes continue to appear strong. The stock increased in abundance from 1978 through 1980 as the strong '75 and '76 year classes recruited to the fishery. Since 1980 the stock size appears to have remained relatively constant. The acoustic biomass estimate for 1981 now agree with the earlier estimates derived from the cohort analysis by Alton and Deriso. The 1983 biomass

estimates for Shelikof St. spawning concentration are 2.5 to 2.7 million tons. The estimated risk of overfishing is about 20% at an OY of 200,000 t and 26% at 240 000 t, the same as presented at the May Council meeting. The incidental catch of halibut from a 40,000 t increased in OY would be expected to be about 360 to 480 t if caught entirely by the foreign trawl fleet. If the 1983 pollock OY is increase by 40,000 t, it appears reasonable to assign all the increase to the central Gulf.

STAUFFER 7/23/83

TABLE 1. PERCENT OF ANNUAL CATCH OR SURVEY SAMPLE FOR EACH AGE GROUP.

SEASON	AGE									
	1	2	3	4	5	6	7	8	9	10
76	*	*	8.7	60.3	20.6	5.8	1.6	1.6	1.0	<0.05
77	*	*	4.5	11.1	54.5	14.2	5.3	1.1	0.5	0.6
78	*	*	46.4	5.8	8.1	14.3	3.2	1.1	0.6	0.2
79	*	*	43.9	32.2	5.6	4.4	8.3	2.8	0.9	0.4
80	*	*	14.3	25.8	15.0	5.4	3.2	3.4	1.4	0.4
81	*	*	16.5	37.7	27.4	8.4	2.3	1.9	1.9	0.3
82	*	*	20.1	33.1	23.8	16.4	2.5	0.3	0.2	0.06
						'76 y/c				'72 y/c
82 JV CATCH	-	3.1	22.5	25.2	23.2	22.4	2.6	0.4	0.2	0.02
83 JV ** CATCH	-	0.4	4.0	31.4	29.4	16.0	15.0	3.3	0.4	-
			'80 y/c			'76 y/c				

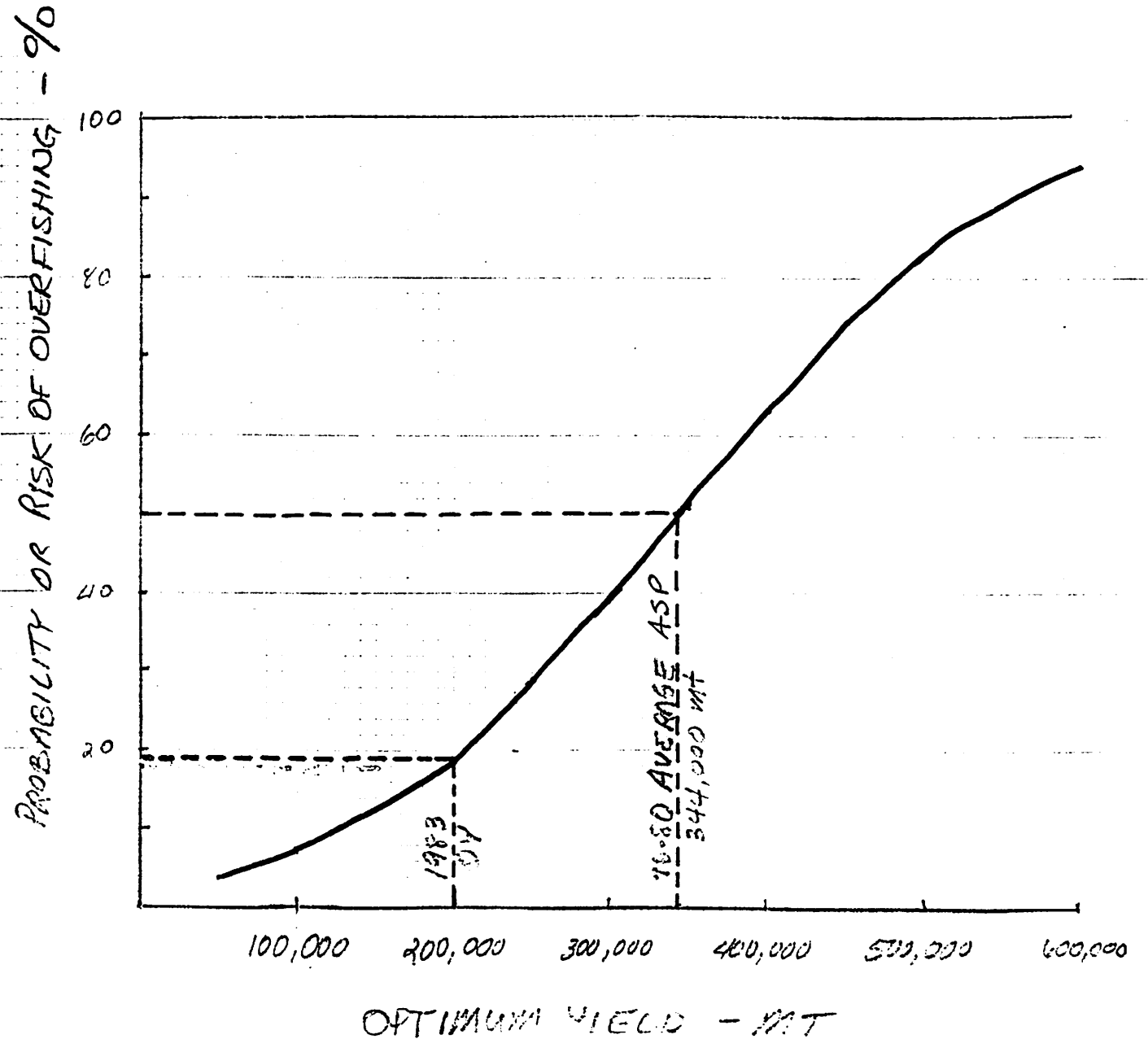
\* AGE COMPOSITION WAS TRUNCATED

\*\* PRELIMINARY NUMBERS



# GULF OF ALASKA POLLOCK

RISK OF OVERFISHING GIVEN THE AVERAGE EXPLOITATION RATE OF 344,000 MT WITH SD EQUAL TO 104,000 MT. FOR THE YEARS 1976-1980.



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PLEASE REPLY TO SEATTLE OFFICE

July 22, 1983

Mr. Jim H. Branson  
Executive Director  
North Pacific Fishery  
Management Council  
Post Office Box 3136 DT  
Anchorage, Alaska 99510

Re: Gulf of Alaska Pollock OYs

Dear Mr. Branson:

We are sending you this letter as attorneys for the Japan Deep Sea Trawlers Association. By letter dated January 17, 1983, we brought to the Council's attention a new study by the Northwest and Alaska Fisheries Center of the condition of the pollock resource in the Central and Western Gulf of Alaska. That study, authored by Miles Alton and Rick Deriso, indicated that the MSYs=ABCs=OYs for these areas had been seriously underestimated for recent years, and had in fact been set substantially below the relevant EYs. Based upon what was clearly then the best available scientific information, Alton and Deriso estimated annual surplus production (i.e., EY) of the Central and Western Gulf pollock resource at between 180,000 metric tons and 508,000 metric tons. The point estimate for EY produced by the Alton/Deriso analysis was 344,000 metric tons. It was on the basis of this analysis that we requested the Council and its advisory bodies to consider increasing the combined OYs for the Central and Western areas from the present level (200,000 metric tons) to 344,000 metric tons.

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Our intention in making this proposal was to provoke discussion on the full range of options between 200,000 metric tons and 344,000 metric tons. At the May meetings, we made clear that we are primarily seeking a 40,000 metric ton increase in the 1983 Central Gulf of Alaska pollock OY to permit the Japanese trawl fishery to operate in that area at approximately the same level as in the last several years. A 40,000 metric ton increase would also benefit U.S. joint venture fishermen in 1984, since 1984 joint venture harvests in Shelikof Strait are currently projected to exceed the present OY for the Central Gulf.

In addition, however, we continue to urge that the Council consider a substantially larger increase in the Central Gulf OY. An OY of 183,000 metric tons in the Central area (i.e., an increase of 40,000 metric tons) will probably restrict the development of the Shelikof Strait joint venture fishery as early as 1984. Since the Shelikof Strait fishery is a highly efficient operation and has few adverse incidental effects (i.e., the halibut incidental catch is essentially zero), it would seem to be in the interests of all concerned to maximize the harvest in that fishery within the limits of sound resource management.

The decision of the Regional Council at the May meeting was to follow the SSC recommendation to maintain the existing OYs in the Central and Western areas until analyses of recent data -- then under study by NWAFC -- became available. The uncertainties identified by the SSC upon which additional data were thought to be needed included the following:

1. The Alton/Deriso stock assessment was based on the estimated conditions in 1981; i.e., the data on which their study was based were two years old and thus might be unreliable.
2. Current conditions are greatly dependent on the strength of the 1977, 1978 and 1979 year classes, and confirmation of the strength of these year classes depends on the 1982 and 1983 catch-at-age data and the 1983 hydroacoustic survey results.

These uncertainties have now been largely resolved. NWAFC has completed the basic catch-at-age analysis for the 1982 foreign and joint venture fisheries and for the 1983 joint venture fishery. Although this data will be further refined before it is published in an NWAFC document, the scientists responsible for the analysis indicate that such refinements should not affect the basic conclusions which may be derived from the data. In addition, biomass estimates are now available from the 1983 hydroacoustic and bottom trawl surveys. From our discussions with Dr.

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Stauffer of NWAFC, we believe that the following conclusions may fairly be drawn from this information:

1. Essentially all pertinent data has been analyzed and is available to the Council now.
2. Analysis of the 1982 and 1983 data indicate that the 1977, 1978 and 1979 pollock year classes in the Central and Western areas of the Gulf are strong year classes. They are as strong as the 1975 and 1976 year classes, previously identified as strong year classes.
3. The 1982 and 1983 catch-at-age data tend to confirm the biomass and EY estimates contained in the Alton/Deriso paper.
4. The NWAFC hydroacoustic surveys conducted earlier this year in Shelikof Strait have produced a biomass estimate of between 2.3 million and 2.5 million metric tons. Data from the bottom trawl surveys conducted at the same time indicate that the bottom component of the Shelikof Strait pollock concentration would add approximately 200,000 metric tons to this biomass estimate. The resulting 1983 Shelikof Strait biomass estimate of 2.5-2.7 million metric tons exceeds the high end of the range of biomass estimates contained in the Gulf of Alaska Groundfish FMP for the entire Gulf of Alaska (1.1-2.1 million metric tons). The FMP biomass estimates are outdated. The Gulf pollock biomass has plainly increased.
5. The  $MSY=ABC=OY$  figures contained in the FMP were derived from this outdated biomass data and are themselves outdated and inaccurate.
6. NWAFC scientists have reanalyzed the data from their 1981 hydroacoustic survey and have revised their biomass estimates for that year from the range originally estimated (500,000 to 800,000 metric tons) to between 3 and 4 million metric tons.
7. The new biomass estimates from the hydroacoustic surveys are now quite comparable to the biomass numbers produced by the Alton/Deriso analysis. The convergence of these estimates tends to support the conclusion that the Central and Western Gulf pollock resource has been substantially underestimated and underharvested in the recent past.

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8. The results of the 1983 bottom trawl survey tend to confirm the reliability of the 1983 hydroacoustic survey. The scientists analyzing the two surveys believe that the results of the surveys are complementary and consistent.
9. Applying the exploitation rate employed in the FMP to the 1983 biomass estimate for Shelikof Strait (.16 x 2.3 million metric tons) produces an OY figure of approximately 370,000 metric tons. The range of OY figures generated using the .16 exploitation rate from the range of biomass estimates falling within 95% confidence limits ( $\pm 43\%$ ) is approximately 201,000 metric tons to 503,000 metric tons. From this perspective the present combined OY of 200,000 metric tons would appear to be overly conservative.
10. Applying the FMP exploitation rate (.16) to the Shelikof Strait biomass estimates derived from the hydroacoustic surveys for 1981 and 1983 produces OY figures which exceed 1981-83 catches by several hundred thousand metric tons. This would appear to indicate that there is a carry-over of several hundred thousand tons from earlier years which should be available for harvest during the next few years.

The uncertainties which concerned the Regional Council in May have been substantially eliminated. All of the pertinent data are available. That data strongly support an increased harvest level in the Central Gulf of Alaska. The best available scientific information would support a substantial increase. We believe that an increase of 40,000 metric tons would actually be a minimal response to the data.

Consequently, we urge the Council to increase the Central Gulf of Alaska pollock OY for 1983 by 40,000 metric tons and to seriously consider a substantially larger increase for 1984.

Thank you very much for your consideration of our views.

Very truly yours,

GARVEY, SCHUBERT, ADAMS & BARER

By  
Stephen B. Johnson

SBJ:jj