AGENDA E-6
September, 1980

M E M O R A N D U M

TO: Council, SSC, and AP

FROM: Jim H. Branson
Executive Director

DATE: September 10, 1980

SUBJECT: Herring FMP

ACTION REQUIRED

Review and possible approval of Herring Fishery Management Plan.

BACKGROUND

During the April meeting, the Council reviewed and acted upon several alternatives that were presented as a result of extensive public comment on the draft FMP. The minutes of the meeting are attachment E-6(a).

The Plan Development Team has since revised the draft accordingly to incorporate the public comments and Council direction on these issues. The revisions to the Plan are listed by section in Attachment E-6(b).

The FEIS and FRA will not be available for review until early October.

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regulation and its ensuing enforcement cost. An explanation was offered by Nick Szabo, Chairman of Alaska Board of Fisheries, who said the pot limit had been a compromise proposal between large and small boat Tanner crab fishermen in the Kodiak area and had been adopted by the Board of Fisheries principally because it represented an industry proposed compromise. The Council also questioned the intent of proposal #8 which would require all floating processors to report their location of operation. Chief among the Council concerns was the impact this might have on catcher/processors who could be disadvantaged in their fishing operations over those fishing vessels that did not have to report their locations. John Gissberg, Assistant Attorney General for the State of Alaska, told the Council he believed the Board of Fisheries and the Council's desires on this proposal were the same and that the intent was not to require catcher/processors to report in the same manner as floating processors.

The Council unanimously adopted proposals #2, #4, #5, #6, and #7.

In a separate motion, the Council also adopted proposal #8, expecting however a clarification from the State of the intent.

The Council abstained from approving or disapproving proposal #3 (pot limit proposal), and instead expressed its intent to allow that State regulation to be enforced in Federal waters and to convey this idea to NMFS with the proposed amendments.

G-3. Herring FMP

The Executive Director announced that the Council had received numerous public comments on the draft plan. The Plan Development Team had responded to these comments by developing additional options to those already in the plan. They were requesting guidance from the Council on some of these options before going ahead and finalizing the plan to present to the Council in September, 1980.

The Scientific & Statistical Committee supported the postponement of the plan due to the lack of time to incorporate the proposed options.

The Chairman of the SSC reported that the SSC conducted a preliminary review of "The Assessment of Herring and Capelin Stocks on Selected Coastal Areas in the Eastern Bering Sea." They provisionally approved the report prior to a comprehensive review by the SSC Subgroup. ADF&G were highly commended for the excellent execution of the project under extreme weather and logistic difficulties.

The following members of the public testified before the Council:

Steve Johnson, representing the Japanese Trawlers Association, was concerned that unnecessary regulations and restrictions be avoided. He supported the recommendations of the SSC and AP on the proposed options.

Norm Cohen, representing the villages of the Yukon-Kuskokwim Area, participated in the suit against Luther Hodges and Cyrus Vance. His testimony is attached as APPENDIX D-1.

David Hoffman representing the Bering Sea Fishermen's Association. His testimony is attached as APPENDIX D-2.

Each option was introduced by the Plan Drafting Team and followed by the AP and the SSC reports. The Council discussed the issue and took appropriate action as follows:

(The numbering scheme refers to that of the decision paper (APPENDIX D-3), and the issue paper (APPENDIX D-4).

2. Incidental Catch - The PDT stated that in order to allow the offshore groundfisheries to harvest their quota of groundfish species, a certain amount of incidentally caught herring must be recognized as a loss. As this is a long term loss not available for allocation to the directed fishery, an Allowable Incidental Catch (AIC) is subtracted from the Acceptable Biological Catch (ABC) rather than the Optimum Yield (OY)as originally proposed in the plan.

There are two options for regulating the incidental catch of herring; Option 1 - consider herring as a prohibited species and Option 2 - establish an allowable incidental catch quota.

Under Option 1 there are two suboptions, either have no quota or a quota as in the mechanism proposed for the groundfish plan for prohibited species (TAC). Under Option 2 there are three suboptions (a) AIC quota would be calculated as a fixed amount from the formula in the plan, (b) would be AIC calculated as a percentage and (c) AIC would be calculated as a fixed amount from historic catch level. These suboptions are discussed at length in the issue paper (APPENDIX D-4). The PDT recommended Option 2 (a) and mentioned that the periodic adjustment which would be made to the percentage to include the consideration of the changing relationship between herring stock status and the groundfish stock and fishery has not yet been finalized.

AP Comments: After extended discussion the Advisory Panel chose Option 2(a).

SSC Comments: The SSC agreed that under the current stock conditions, herring should not be considered a prohibited species and Option 1 was rejected as being without scientific merit or justification. Allowable incidental catch, Option 2(b), seemed to provide adequate protection for herring stocks by allowing the foreign groundfish fishery to operate within reasonable conservation guidelines. The SSC recommended that the AIC be determined by calculating the percentage of incidentally caught herring the last year of record and that this percentage be applied to the projected current year's catch.

Council Action: The Council chose Option 2(a), adding in a recommendation that the plan contain a means of accommodating the changing relationships to avoid annual amendments.

3. Offshore Allocations - After the estimation of the available surplus in September of each year, all or part of the amount can be allocated to the offshore domestic and foreign fisheries.

There are two options, allocation of all the surplus, or, partial allocation of the surplus. These are discussed in greater length in the issue paper. The PDT recommended Option 2, although they did not specify which suboption they preferred.

Chairman Tillion remarked that there was no doubt that a lower exploitation rate on the offshore stocks would be more appropriate if one could determine the right figure. The Team replied that there was no good data on which to base a decision.

Bevan stated that the Council might wish to include "fudge" factors and requested the team to continue looking into possible mechanisms of controlling the offshore fishery. He stated that the mechanism might be needed in the future. However, he remarked that the methods currently proposed made biological nonsense. He also added that there were conservation factors included in the plan, (for example, the selection of the low end of the ranges).

AP Comments: The AP chose Option 1. The motion was passed on a vote of 7 to 4.

SSC Comments: The SSC majority opinion favored Option 1, allocation of all the surplus. They noted that there is no scientific evidence to support or suggest an appropriate downward adjustment. They noted that major herring stocks are generally in good condition and most are increasing throughout the Bering Sea. If stock conditions change, then other options should be reconsidered. Some members expressed concern regarding the potential for overharvest of small discrete stocks by the offshore mixed stock fishery and the current inability of the resource agencies to evaluate this problem.

Council discussion centered around the problem of protection of the stocks either through a reduced exploitation rate for the offshore stocks emergency provisions in the plan, or partial allocation to the offshore fishery.

Steve Pennoyer discussed the issue of a fishery on a mixed stock and compared the situation to the salmon fisheries.

Bevan alerted the Council to the problems inherent to the suggestion to implement emergency management measures. Specific guidelines and mechanisms would have to be prepared for the Regional Director to implement these measures. He requested the scientists to prepare further advice on the best means of doing this and cautioned the use of arbitrary figures.

Steve Pennoyer further elaborated the issue of a mixed-stock fishery. On a point of clarification, Pat Travers elaborated that if a mechanism for establishing a new exploitation rate was included in the plan with Regional Director authority, a discretionary set of standards for his decision should be included based on the assessment of stocks. Bevan stressed the necessity for an annual update of OY which would not need to be implemented through the amendment process. He made the motion to proceed with the recommendations of the SSC with the understanding that the team would keep working on the issue. The motion to adopt option 1 was carried 7 to 4

10. TALFF

The Plan Drafting Team introduced the option of either (1) no TALFF or (2) TALFF. The option to have no TALFF was included in response to the request to consider no allocations to the foreign fisheries because of market considerations.

AP Comments: The AP moved to adopt Option 2 with the understanding that the OY will be reassessed after the inshore fishery is conducted. That motion was unanimously passed.

SSC Comments: The SSC noted that any reduction of TALFF must be a result of no surplus OY and not simply a preferential statement against the allocation to foreigners. They went on to say that since foreign fleets may be competing with the same markets as the U.S. industry, the Council may wish to have economic and marketing studies to evaluate this and other OY issues for future Council consideration.

Council Action: The Council unanimously approved the motion to adopt Option 2.

11. Time/Area closures during the inshore roe season.

During the inshore roe season, the plan proposes that the FCZ be closed to herring fishing from April 1 to July 1 south of 60° N. latitude and to August 1 north of 60° N. latitude. This is further discussed in the issue paper. There are three options for management under this issue: Option 1 - close the FCZ to the food and bait fishery, Option 2 - open the FCZ in all areas, Option 3 - open the FCZ either west of 168° West longitude or south of 56° North latitude. These are discussed in greater detail in the issue paper.

AP Comment: On the matter of the inshore roe fishery - April 1 to July 1
- the offshore domestic food and bait fishery - the Panel chose option 1, to close the FCZ to the food and bait fishery. The motion passed unanimously.

SSC Comment: The SSC recommended that the FCZ be closed to herring fishing during the inshore roe fishing period to prevent potential conflicts between inshore and offshore domestic fisheries and in consideration of plan priorities.

Council Action: The motion passed unanimously to adopt Option 1.

12. Domestic food and bait fishery; harvest of any remaining initial allocation after September 30th.

The PDT explained if only the inital allocation remained for the winter food and bait fishery (i.e. no allocation of surplus from the inshore roe fishery), then the amount of initial allocation remaining could be harvested, either, Option 1, unrestricted or Option 2, South of 56° North latitude until the quota is taken, or, Option 3, unrestricted until quota taken except in the herring savings area.

AP Comment: If any part of the initial offshore food and bait allocation remains after September 30, the AP recommended Option 1.

SSC Comment: Except for the previously noted closure of the FCZ during the roe fishery, the SSC supports Option 1, which is unrestricted fishing for any allocated quota. There was no evidence presented to justify restrictions on the winter harvest of the initial allocation.

COUNCIL ACTION; The Council approved Option 1 unanimously with no comment on the issue.

14/13. Implementation and configuration of the Herring Savings Area.

The Plan Drafting Team introduced the issue, (further discussed in the issue paper) and outlined the Options for the implementation of a herring savings area: Option 1, close all fishing when there is no TALFF or when TALFF does not exceed AIC; or Option 2, when observer coverage is below a minimum level during November to March in Statistical Area 2 whether TALFF is available or not; and/or Option 3 allow individual vessels with observers to fish; and/or Option 4, exempt longlining from the closure.

These options are discussed in greater detail in the issue paper.

AP Comment: The AP endorsed the concept of establishing a herring savings area to protect herring when stock biomass is down. However, there appears to be no problem for the 1980-81 fishing year and a closed area seems to be unnecessary. The AP supported the SSC recommendation. The minority opinion supported a mechanism whereby an area closure could be implemented but not necessarily limited to the areas described.

SSC Comments: The SSC endorsed the concept of establishing a herring savings area to protect the herring when stock biomass is down. However, there seems to be no problem for the 1980-81 fishing year. They suggested that discussion of a closed area remain in the plan but that no regulations be promulgated at present. They requested further evaluation of the herring savings area concept to determine which areas should be considered under various conditions, the potential impacts to the groundfisheries and how such a closure should be implemented. The SSC recommended increased Coast Guard surveillance in the proposed savings area to prevent any direct targeting on herring stocks when there is no TALFF.

The SSC also recommended that the longline fishery be exempt from any closure.

Council Action: A motion was proposed to adopt Options 1 and 4 with the understanding that flexible procedures be included in the plan which would allow the implemention of a herring savings area if necessary and that the PDT would continue to study this issue.

The PDT recommended Area C because this area included the greatest concentrations of herring over a number of winters. They also elaborated on the catch of pollock in these areas and the percentage of herring in the catch. They recommended Area C in conjunction with Regional Director in season authority to close areas within Area C, if necessary (i.e., Option 3 of issue 13).

In response to the query of whether the herring were likely to go beyond Area C, the Plan Development Team responded that most of the herring are generally found within Area C. The AP Chairman noted that pots should also be considered exempt from closures.

The Council moved and carried a motion to approve Options 1 and 4. The PDT proposed an area to be defined within Statistical Area 2 giving specific criteria and a mechanism for seasonal adjustment.

G-4. Gulf of Alaska Groundfish FMP

The Scientific and Statistical Committee presented the groundfish subgroup review of proposed amendments for both the Gulf of Alaska and the Bering Sea/Aleutian Islands Groundfish FMP's. The subcommittee directed their review to the BS/AI plan and no comments were made on the Gulf of Alaska plan.

The Advisory Panel presented a report to the Council recommending a joint venture policy statement to be included in both groundfish plans. The language approved by the AP is:

> "The Council finds that one method of implementing provisions of the processor amendment (P.L. 95-354) requires that ocean areas in the vicinity of U.S. processing facilities be designated as closed areas to joint venture processing operations.
>
> "The Fishery Management Plan therefore provides that the Regional Director, NMFS, Alaska Region, upon the recommendation of the Council, designate such areas within which foreign fishing vessels may not receive U.S. harvested fish."

The Advisory Panel also approved the idea of specific time/area closures for the Kodiak king crab district to prohibit foreign trawling to avoid gear conflicts and ground preemption.

AGENDA E-6(b)
September, 1980

REVISIONS TO HERRING FMP 1/

Section

4.0 Operational definition of terms. OY, AIC, and DAH definitions revised; editorial.

5.0 Fisheries data updated; marketing data updated; editorial.

6.0 State management information updated; offshore management under PMP updated; editorial.

7.0 Editorial.

8.0 Editorial.

9.0 Stock units updated; stock biomass estimates expressed as a percentage; expansion of marine mammal and herring interaction discussion and transfer to Environmental Impact Statement; status of stock updated; spawning biomass methodology updated; clarification of methodology for annual determination of ABC; incorporation of Allowable Incidental Catch methodology concept.

10.0 Expansion of discussion on time/area closures to consider general issue of incidental harvest of herring in the trawl fishery; tables updated.

11.0 Fisheries data updated; annual estimation of Domestic Annual Harvest methodology incorporated.

12.0 Optimum Yield/Total Allowable Catch concept revised; OY concept redefined; annual estimation of OY methodology incorporated.

14.0 Objectives revised; justification and rationale of objectives incorporated; allocation of preliminary OY methodology clarified; Allowable Incidental Catch estimation methodology incorporated; final OY allocation modified, conditions for closing areas to herring fisheries expanded; reduction in offshore OY methodology deleted; management measures for domestic fisheries modified to incorporate closed time/area during inshore roe season; food and bait management measures modified to include less restrictive options; update of permit requirements and statistical reporting requirements; time/area closures discussion and expanded by additional data and analysis; PDT recommendation incorporated; operational costs updated.

15.0 Consideration of other applicable law transferred to the EIS.

18.12 Revised Environmental Impact Statement.

1/ Not in order of priority.

MUNDT, MACGREGOR, HAPPEL, FALCONER & ZILAUF
ATTORNEYS AT LAW

[illegible]

[illegible]

September 16, 1980

Clement V. Tillion, Chairman
North Pacific Fishery
Management Council
Post Office Box 3136 DT
Anchorage, Alaska 99510

TELECOPIED

Re: Proposed Bering-Chukchi Sea
Herring Fishery Management Plan

Dear Mr. Tillion:

It is my understanding that the North Pacific Fishery Management Council will consider and possibly take action on the above-referenced FMP during its meeting in Sitka next week. In that regard, we would like to reiterate several of the points discussed in our original comments on the plan which were submitted to the Council on February 29, 1980.

First, we do not believe that the FMP should automatically prohibit a foreign directed fishery for herring. Although we recognize that biomass estimates and projected DAH levels in any given year might preclude the existence of a TALFF, we believe that the FMP should be flexible enough to allow a directed fishery--particularly a gillnet fishery--in those years when a surplus does exist. As discussed in our earlier comments, there are a number of distinct advantages, both from a biological as well as a socio/economic viewpoint, in having available surpluses taken by gillnet. The FMP should not, therefore, restrict the options which would otherwise be available to the Council in those years when a surplus does exist.

Second, we believe that foreign longliners should be exempt from the closure provisions of the FMP which would prohibit any further fishing by vessels of a nation once that nation's allocation of the herring TALFF has been exhausted. As no herring is taken in longlining operations, there would appear

to be no justification for including longline vessels in the closure provisions of the FMP.

Thank you for your consideration of these comments. If you or any of the other Council members have any questions concerning the points discussed in this letter, or our letter of February 29, 1980, we will be happy to discuss them with you in Sitka.

Sincerely yours,

MUNDT, MacGREGOR, HAPPEL,
FALCONER & ZULAUF

Paul MacGregor

PM:as

AGENDA E-6(d)
September, 1980

AMERICAN FISHERIES PRODUCTS
"HARVESTERS OF THE NORTH PACIFIC"

4315 11TH N.W.
Seattle, Washington 98107
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Ken Petersen
Carl Perovich

F/V AMERICA NO. 1

September 17, 1980

SEP 18 1980

Clement V. Tillion, Chairman
North Pacific Fishery Management Council
P.O. Box 3136DT
Anchorage, Alaska 99510

Dear Clem:

As you are aware the draft FMP for herring has been under consideration by the Council for some time and it is my understanding that a revised version will soon be sent to the Council for public review. It is difficult to interpret the intent of the current plan as it would impact on domestic high seas fishing. We are sympathetic with the priority established for the subsistance fishery. The division between and/or priorities for other domestic fisheries are less evident and largely unsupported in terms of allocation between domestic users.

As owners and operators of the American No. 1 we are vitally interested in the ultimate allocation procedure established. We are hopeful of conducting a winter trawl fishery commencing in January of 1981, and hence an allocation for a domestic high seas fishery becomes essential.

I am aware that the 1980 ariel surveys conducted by the ADF&G observed substantially less herring on the spawning grounds than in 1979 which may influence the 1981 management regime. However, we are also aware that the NMFS has extablished (in a draft) a suggestion that the minimum possible biomass during 1980 was 170,000 tons amd that the 1981 preliminary ABC be established at about the same level as 1980, or 42,000 metric tons.

We would much appreciate your informing the Council of our interest and need as it relates to an offshore domestic fishery. Currently we are hopeful that a quota of 10,000 tons could be identified for high seas trawl fishery. Your assistance in this matter would be greatly appreciated.

Sincerely,

Kenneth R. Petersen

AMERICAN FISHERIES PRODUCTS
Kenneth R. Petersen

AGENDA E-6(e)
September, 1980

DRAFT SUMMARY

HERRING SYMPOSIUM

February, 1980

F O R I N F O R M A T I O N O N L Y

--DRAFT--

HERRING SYMPOSIUM SUMMARY

The purpose of the research workshop was to discuss research methodologies used among the different herring investigators and to examine the feasibility of utilizing various methods for improving research on Alaskan herring stocks, particularly eastern Bering Sea stocks where extensive research activities have only recently begun. Originally, the workshop organizers hoped that it would be possible to identify a single best method for a research area, and avoid expensive and time-consuming false starts and blind ends; however, one overriding theme was that each geographic area and stock are unique, and it may be imprudent to discard methodology because it was unsuccessfully employed in other stocks or areas.

Different geographical approaches to research became clear in the workshop discussions. These differences were partly due to basic biology, especially spawning behavior: Atlantic herring spawn mainly in deep water (greater than 100 feet), while Pacific herring spawn mainly in the intertidal and shallow subtidal areas. The sharpest differences were between Pacific coast biologists who advocated direct measurements or estimates of stock abundance, and Western Atlantic biologists who preferred methods based on cohort analysis. Europeans fell somewhere in between and mixed direct and indirect methods.

The workshop covered stock assessment, stock separation, environmental factors, and general fishery statistics. Stock assessment discussions focused on the methods used with various stocks and their relative advantages and disadvantages. Stock separation dealt with the necessity of identifying separate stocks, various efforts to define stocks, and the methods employed. The discussion of environmental factors examined possibilities of predicting or monitoring changes in herring abundance through various oceanographic

or climatological parameters. Discussion of fishery statistics centered on collection, use, and interpretation of various fisheries statistics.

Stock Assessment

The section on stock assessment covered: aerial surveys, spawn surveys, hydroacoustic-trawl surveys, larval-juvenile surveys, and statistical assessment procedures.

Stock assessment methodology differences were found to exist between biologists working with Atlantic stocks and those working with Pacific stocks. In the Pacific, efforts are concentrated on direct assessment of biomass, generally prespawning or spawning adults, while in the Atlantic fishery data is used to assess adults direct assessment in the Atlantic is generally limited to assess fishery prerecruits.

Aerial Surveys. Aerial surveys are utilized by Alaska Department of of Fish and Game to assess spawning biomass along eastern Bering Sea spawning grounds. This method is also reportedly utilized in the USSR on spawning grounds in the western Pacific Ocean. Basically, the procedure in the eastern Bering Sea involves counting herring schools and determining the total surface area of schools on the spawning grounds per day. The highest daily surface area count obtained for the season is used to estimate spawning biomass where spawning grounds are in close proximity, while in areas where spawning grounds are widely separated, peak counts separated by two-week intervals are summed. Peak counts are used to prevent multiple counts of the same school which could occur from prolonged stays on the spawning grounds or movement between spawning areas. Movement patterns are presently unknown, but within the major spawning area, two post-spawning "staging" areas and exit routes are postulated.

Herring school surface area is converted to biomass estimates on the basis of herring density estimates obtained from commercial purse seine catches. A range of densities, derived from the observed densities, are applied in converting school surface area to biomass to account for depth differences between areas. The estimated biomass of schooling fish is adjusted to account for other schooling fish in the area as determined from variable mesh gillnet samples.

Most of the participants in the workshop were unfamiliar with aerial assessment of spawning biomass, but all believed that it was a very advantageous method. The prevailing view was that aerial surveys should be utilized as a primary stock monitoring technique for eastern Bering Sea herring stocks and that emphasis should be placed on refining the technique.

It was pointed out that in the absence of data on movement patterns into, within, and out of spawning areas that it was advantageous to utilize peak counts to avoid erroneous estimates due to multiple counts of the same schools. Also, it was thought that efforts should be placed toward obtaining a greater number of school density estimates, since the present sample size is extremely small.

Some concern was expressed that biomass estimates may be overly conservative since herring are known to spawn in waves over the spawning season. Concern was also expressed that since surveys were flown during the day at low tide, a significant portion of the biomass might not be observed. This was recognized as a problem which might be solved with increased effort to measure variability but of secondary importance. Herring are known to spawn at night in other areas, and movement into and out of spawning areas is highly variable. Stocks act differently and annual variation is also common, and a high degree of variability was felt to be a standard problem with

instantaneous surveys of this kind.

Spawn Surveys. Spawning deposition surveys are used in California, Washington, and British Columbia as a means of estimating the size of the spawning stock. Spawning substrates are observed during the spawning period to monitor egg deposition. The number of eggs deposited is estimated, and the stock size is estimated by calculating age composition, eggs per female, and sex ratios. In British Columbia, harvest strategy is designed to allow an escapement of an "optimum" amount of spawning herring. The premise of optimum egg coverage is that if enough eggs are properly distributed, the maximum number of eggs survive into the critical larval stage. Applying growth and mortality rates to the estimated spawning escapement provides an estimate of survivors from the previous fishery. Addition of recruitment estimates total population for the next fishery.

Hydroacoustic-Trawl Surveys. Hydroacoustic-trawl surveys are utilized for stock assessment with varying success depending on local conditions. In southeastern Alaska, British Columbia, and Washington, hydroacoustic surveys are performed prior to spawning in order to assess recruitment and total spawning biomass. In Norway, hydroacoustic surveys are done in the autumn on juvenile herring to estimate recruitment; however, in the past they found it difficult to use on adults. In the northwest Atlantic, groundfish trawl surveys are believed to provide good estimates of adult herring biomass.

The consensus of the group was that hydroacoustic-trawl surveys were a useful assessment tool but, as with other methods, have shortcomings. Especially critical are the requirements for a good knowledge of distribution, and for surveys to be accomplished in a short time frame to avoid multiple observations. Densities obtained in a narrow trackline need to be extrapolated over

a larger area, and extensive trawl sampling is needed where herring are mixed with other species.

Hydroacoustic-trawl surveys also have potential in assessing juvenile herring; however, as with adults, it is very important to have a good knowledge of distribution patterns. As with adult surveys, effort must be intensive; examples were cited from the Barents Sea (which is equivalent in area to the Bering Sea), where young capelin have been surveyed acoustically annually using 3-4 vessels in a 10-12 day period. This survey has been conducted for 15 years, and the biologists believe that they may not have enough distributional data to reduce the current level of survey effort.

Larval-Juvenile Surveys. In regard to larval-juvenile surveys, it was felt that results are proportional to the size of the fish (i.e. better results from largest fish). Larval surveys were believed to be of little value, when it was possible to carry out assessment at later life stages. In the North Sea, larval surveys are used because there is no direct access to the spawning grounds, larvae are well dispersed, and standard surveys give some indication of spawning stock size and an estimate of the size of the year-class. In the Pacific, it was felt that larval and juvenile surveys may be invalid in some areas due to variable, patchy distribution patterns, and that standard grid patterns may give very imprecise results. Washington State biologists, however, reported that surveys of 6-9 month-old juveniles are providing a good index of recruitment.

In all stocks discussed, juveniles are known to have a distribution pattern distinct from adult herring, and age 0 herring are generally separate from age 1. The typical pattern for age 0 and 1 herring is to remain inshore; offshore movement and increased migration occurs as the juveniles approach

maturity. In the Gulf of Main, juvenile surveys were found to be difficult because of the behavior of juvenile herring to concentrate nearshore in scattered schools except when strong year-classes occur. In these years, young herring are more widely distributed and are found in offshore areas in large numbers.

In general, it was felt that prerecruit surveys are only usable after a long-time series has been established, thereby enabling comparisons with direct estimates and identification of inconsistencies. Pilot studies are needed to define distribution patterns, and behavioral anomalies induced by density and environmental changes. Also, the closer the survey is to recruitment to the fishable stock, the more reliable the estimates are; however, there was some concern expressed that if young herring from several discrete stocks were intermingled it may be difficult to apportion estimates to the various stocks.

Fishery Statistics. Virtual population analysis (VPA) or its variant, cohort analysis, was discussed as a stock assessment tool. This method is utilized extensively in the North Atlantic for herring and other species. In the North Pacific, its use has been limited to a few demersal species for which a long-time series of catch data exists. The method involves computations of stock size based on rates of fishing and natural mortality. It estimates past values of fishing mortality and stock size, which then may be utilized to indicate present stock conditions and to forecast future conditions. Good catch-at-age data and estimates of natural and fishing mortality are needed. The procedure only estimates the portion of the population subject to fishing, and the abundance of newly recruiting fish must be estimated independently.

The application of this method to Pacific herring was questioned from the standpoint of much higher natural mortality rates for Pacific herring ($m = .4-.5$) versus Atlantic herring ($m = .2-.3$), and the high variability in age and rate of maturity (recruitment to the roe fishery). This and the fact that Pacific herring survive for only a few years following recruitment caused concern that the method would yield results vastly different from those obtained from direct measurements, such as spawn, trawl, or aerial survey. However, biologists working with Atlantic herring did not feel that these factors precluded the use of the method, and that the method would be a very useful means of examining variability. Also, they felt that the data used for cohort analysis are standard management data, and very little extra effort or expense is needed to collect the data needed. The opinion was offered that while exploitation was low (as in the Bering Sea), attempts should be made to get a data base on rate processes to use later on to prevent overfishing in years of low abundance.

Various aspects of fishery statistics were discussed during the discussion of stock assessment. Topics included use of catch per unit effort (CPUE) data, gear selectivity, age composition data, aging techniques and fecundity analysis.

CPUE data was generally felt to be of little value as an indicator of herring abundance. Opinions were expressed that schooling behavior makes CPUE data misleading. Also in roe fisheries or other intensive fisheries, gear saturation can occur if there is a rapid congregation of a large amount of gear. CPUE data is also negated if quota or effort limitations exist. However, it was pointed out that if fishermen do not alter their fishing behavior during declines or increases in stock abundance, then CPUE data can be useful, but not sufficient.

Gear selectivity was discussed as an important aspect of determining and evaluating abundance data, and measuring age compositon. Variable mesh gill nets, as used to sample age composition in the Bering Sea, were believed to be an adequate means of sampling age composition, but care must be taken in the interpretation of data as there may be a tendency toward sampling larger, faster growing fish in a year-class.

Trawl sampling of pre- or post-spawning concentrations was suggested as a possible means of estimating age composition and obtaining reliable abundance data. Canadian scientists found that in Barkely Sound, B.C., age distribution and relative abundance were essentially the same between pre-spawning and post-spawning herring. Traps, weirs, and other similar gear types were suggested as possible sampling tools to overcome problems of gear saturation in determining CPUE and age composition.

Age composition data were generally regarded as a major consideration in designing a field program. It was emphasized that care must be taken in sampling gear and in differentiating between catch samples and population samples. Age composition data are needed from both the catch and the population to determine relative removals and for input into analytical models for determining stock status and trends.

Some discussion occurred relative to what structure should be utilized for aging. North American biologists studying Atlantic herring utilize otoliths, while those involved with Pacific herring utilize scales. Otoliths were generally regarded as having the advantage that they can be recovered from every fish in a sample, whereas herring can be completely scaled or have a high percentage of regenerated scales. Lack of clarity of the first annulus of an otolith was cited as a reason for not utilizing otoliths from

Pacific herring, but samples from the Bering Sea indicate that herring in that region may be aged using otoliths. Ease of collecting, processing, and storing scales is a factor favoring these structures.

Herring fecundity analysis was discussed along with spawn surveys. The concensus was that for purposes other than to compute the size of the parent population, there was little purpose in collecting this data. Further, it was noted that if spawn surveys are utilized, it should be recognized that fecundity is variable and fecundity measurements must be reevaluated annually or semiannually.

Environmental Parameters

Oceanographic and environmental relationships were discussed with the purpose of determining parameters which could indicate changes in year-class survival. This subject has been explored to varying degrees among the major herring stocks, but definite predictive relationships have not been identified. The parameters discussed as having potential impact on year-class success were temperature, salinity, currents, food availability, and predation. Generally, it was regarded that these factors were most effective during the larval stage of development.

Temperature relationships have been found to exist at a gross level. An example cited was the occurrence of large year-classes in the northwest Atlantic which were associated with years of high water temperatures in the mid-1950's. Temperature was also believed to indirectly influence year-class abundance through food availability. In the North Sea, Calanus sp. distribution and abundance have been found to be temperature related. Indications are that the distribution and abundance of Calanus sp. at the time larvae begin to feed is an important factor of larval survival and subsequent year-class strength.

Currents or net water transport were also considered to be factors affecting herring survival. In the North Atlantic, herring spawn in deep water where temperature and other oceanographic parameters are nearly constant. In these areas, drift patterns are believed to be important determinants of survival as it regards the movement of larvae into or away from predators or food sources. Some discussion occurred on whether or not larvae were mobile and unaffected by drift. Canadian scientists reported that in the Bay of Fundy herring drift to some extent, especially prior to formation of the caudal fin, and that some correlation was found between year-class strength and the length of time drift bottles remained in the bay.

Salinity did not appear to correlate with year-class strength, but it was observed that in western Canada the best survival of eggs under laboratory conditions occurs at 17-20°/00 salinity. It was speculated that survival may be greatest in years of above average precipitation and run-off, where fresh water inflows maintain coastal salinity at this level.

Mathematical models as management tools were touched upon during the discussion of ecosystem relationships and environmental parameters. Multi-species ecosystem-type models received support as a learning tool, however, poor data and lack of understanding of biotic and abiotic interrelationships make these models unreliable (and possibly dangerous) for management use. Single species models were viewed as a more useful techniques, recognizing that models developed for demersal species are not applicable to herring. Hindcasting and forecasting through use of cohort analysis seem to be a valuable tool that requires an independent index of abundance.

Stock Identification

The problem of stock identification was discussed, focusing on studies currently in progress in the eastern Bering Sea, to examine the methodology

employed and the potential of these and other methods of stock identification. Two papers presented to the workshop on current eastern Bering Sea stock separation research formed much of the discussion on stock separation, and summaries of the papers are included.

The consensus of the participants was that there is no method that is totally definitive of stock structure, but of all the methods available, tagging provides the most conclusive results. However, results are dependent on recovering a sufficient number of tags, which may not be possible when some stocks are not fished or only lightly fished.

Morphometric measurements, growth differences, parasite analysis, and scale analysis have all been tried among the world's major stocks with mixed results. However, although a method was unsuccessful in separating stocks in one area, it may be useful in another, and these methods have been found to corroborate results achieved through tagging.

Biochemical Genetic Variation in North Pacific Herring[1/]

The rationale for using biochemical genetic markers to identify herring stocks, or any fish stocks, is that whenever populations become isolated from one another they tend to diverge genetically because of chance changes in their genetic structures. Isolation can be achieved through the imposition of physical barriers to migration or through behavioral changes in spawning. At any point in evolutionary time, the degree of divergence between geographic stocks can be measured by surveying a large number of genetic loci to assess the gene similarity among the stocks. One class of structural loci, those coding for enzymatic proteins, can be assayed for inherited variants using starch gel electrophoresis.

In this study, samples of herring were collected from several locations in the western and eastern North Pacific Ocean and in the eastern Bering Sea. Gene frequencies at 28 polymorphic loci were determined from the samples and used to describe the prominent features of population subdivision of North Pacific herring. Cluster analysis of genetic similarities between the samples revealed two major geographic races. One group included populations in the western North Pacific Ocean and Bering Sea and the other group included populations in the Gulf of Alaska and the eastern North Pacific Ocean. Presumably, the Alaska Peninsula and the Aleutian Island chain is the boundary between these two groups. Future sampling will provide a better understanding of the populations in the transition area. Analyses of the Bering Sea samples and the eastern Pacific samples indicated that within each area gene frequencies were homogeneous.

1/ Stewart Grant; National Marine Fisheries Service; 2725 Montlake Blvd. East; Seattle, WA 98112

The results of this study indicates that there are large genetic differences between two groups of North Pacific herring but that within each group genetic differences among populations are minimal. This genetic population structure suggests that within each area mixing between populations is sufficient to prevent major local genetic differentiation. Furthermore, the homogeneity of gene frequencies within each major group does not permit the use of biochemical genetic marker for local stock identification.

Separation of Spawning Stocks of Bering Sea Herring Based on Scale Growth Patterns[1/]

The reasoning behind the use of scale patterns to identify fish stocks is that scale growth patterns reflect to varying degrees environmental and genetic differences between stocks. In an effort to determine whether scale analysis would be useful for identifying stocks of herring within the eastern Bering Sea, a study was initiated with the following objectives: (1) to examine scale growth patterns of fish from four spawning location, (2) to examine scale growth patterns in one brood year for successive years, (3) to examine temporal variation during the spawning season, and (4) to quantify scale pattern differences among locations using discriminant function analysis.

Scales were collected from fish at four spawning locations in the eastern Bering Sea in 1978 and 1979 (Fig. 1): Port Clarence, Cape Denbigh, Cape Romanzof, and Togiak. Age classes with sample sizes large enough for analysis were the 1979 age 3, 1978 age 4, 1979 age 5, and 1978 age 6 groups. Only the 1979 age 5 group was represented from all locations. The remaining age classes were represented by samples only from Cape Denbigh, Cape Romanzof, and Togiak. The standard length of each fish was measured, gonad development noted, and several scales removed for analysis. Scales were observed at 40X magnification, and the distance from each annulus to the focus of the scale was measured in millimeters. Fish body lengths were backcalculated from these measurements, and growth increments were computed for each year.

All of the scale measurements and body lengths for each age class were normally distributed except for the measurements of the Port Clarence 1979,

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1/ Katherine A. Rowell; Alaska Department of Fish and Game; 333 Raspberry Rd.; Anchorage, AK 99504

age 5 samples, which were bimodally distributed. Bimodality was apparent in both fish length and total scale radius measurements. These results suggest that this sample was composed of two populations and was, therefore, divided into two groups having body lengths of 200 mm or less (A), or greater than 200 mm (B).

An examination of growth curves indicated that the Cape Denbigh and Cape Romanzof samples were similar for all age classes. These data also indicated that Togiak fish grew faster and, hence, were larger than fish at other locations for comparable age classes. Age 5, 1979 fish were available from all locations sampled and backcalculated growth curves for these samples (Fig. 1) indicated the presence of three distinct geographic groups. The first group, Port Clarence A, had the lowest growth rates. Growth curves for Port Clarence B, Cape Denbigh, and Cape Romanzof were similar and were considered to encompass the second group. Togiak fish had the greatest growth rates and formed the third group.

Samples were taken at Togiak throughout the 1978 and 1979 spawning seasons to detect possible temporal variation in scale characters. However, scale variables and body lengths for each age class did not change during the spawning season. In addition, the backcalculated body lengths, estimated from the same brood year, did not change for the two successive years. These results suggest that one sample per spawning season is adequate to characterize a population and that data taken one year can be used in subsequent years.

Discriminant function analysis was used to distinguish among the samples where the backcalculated body lengths of each annulus were used as the discriminating variables. This method could not distinguish between Cape Denbign and Cape Romanzof fish for any of the age classes. Togiak fish were distinct from the other locations.

Classification of test samples using a discriminant function generated by learning samples at the same locations was most successful with 1978, age 5 fish. Overall, the classification success was 84%. The classification success rate for the Port Clarence A sample was 100%, for the Port Clarence B-Cape Denbigh-Cape Romanzof group was 81%, and that of the Togiak sample was 71%. Another classification test was made where 1979, age 5 Togiak samples were classified using data from 1978, age 4 fish for the discriminant functions. In these results, 71% of the Togiak fish were correctly classified as Togiak fish.

The results of this study show that at least three distinct stocks can be distinguished in the eastern Bering Sea using discriminant analysis of scale growth patterns. The high success rate in correctly classifying samples of one year class using discriminant function based on the same brood class collected in the previous year indicates that this method can be useful for identifying stocks in areas of mixing.

Management Workshop

The management workshop focused on four issues: (1) yield strategies, (2) mixed stock fishing, (3) juvenile fisheries, and (4) allocation between gear types. Management differences were found to exist between the Pacific herring currently falling under single country management and Atlantic herring subjected to multi-national management. The common thread through discussions of Atlantic herring management is the inability of the participating nations to respond rapidly to seriously declining stocks with an effective coordinated program which all nations could accept.

In the Atlantic, before the crash of the herring populations, fisheries occurred on nearly all stages of the herring life cycle. Fishing began on herring as early as age 0, often for reduction to oil and meal and for use as sardines. Heavy fishing occurred on spawning herring and also on the feeding grounds. Technology increased effectiveness of the fleets, and the stocks characteristically declined during the 1960's. Scientists pointed out warning signs and recommended drastic reduction in harvest, but the multi-national management regime prevented effective action. Concomitant with the declining abundance, the stocks often showed major deviations in behavior, commonly reducing the migratory range and increasing rates of growth and time of maturity.

Yield Strategies

Yield strategies utilized in herring management worldwide moved from a maximum yield basis to ones which recognize the importance of maintaining a certain level of spawning biomass. It is generally recognized that herring cannot be managed on a sustained yield basis, and MSY should only be utilized as a general guide.

In the northwest Atlantic, herring stocks are managed to produce yields at or below the $F_{0.1}$ level. The $F_{0.1}$ level is derived from yield-per-recruit analysis and is the point on the yield-effort curve where yield/effort deminishes to 10% of what would have been achieved in a virgin fishery. The $F_{0.1}$ level is regarded as a guideline upper limit, and some stocks are fished at lower levels. Control of fishing effort is recommended by some biologists as a means of achieving the proper level of yield rather than catch quotas. Harvesting above the $F_{0.1}$ level occurs when strong year-classes occur, but it was recommended that pulse fishing of strong year-classes should only take place if it can be done without adding additional fishing effort.

European scientists also recommend management be based on yield strategies that maintain spawning biomass above a minimum threshhold level. Regulation is by quota and is largely influenced by assessment of recruiting year-classes. They believe that by maintaining an adequate spawning biomass and adjusting catch quotas to recruitment trends exploited herring populations should achieve a balanced age structure which in turn should stabilize fisheries and planning.

In the northeastern Pacific, herring are generally managed on escapement (egg deposition) or catch quotas based on total population size. In British Columbia, escapement is set at a level that historically produced the greatest recruitment; herring that are surplus to escapement requirements are harvested. In southeastern Alaska, optimum escapement is unknown but stock abundance is known to be low and only 10% of the estimated biomass is harvested in order to increase abundance. When a stock is below a determined minimum biomass, no fishing occurs, and if strong year-classes are present 20% of the biomass

may be harvested. In Washington, harvest is limited to a catch ceiling of 20% of the total abundance, with a minimum spawning escapement threshhold below which fishing will not be allowed. In this way, it is assumed the stock will be protected from sharp reductions due to recruitment failures, and herring are maintained at a level that provides adequate forage for predators (i.e., salmon).

Management for escapement requires that the spawning population be evaluated prior to spawning in order to assess the recruiting age classes. Also, it necessitates a close monitoring of spawning to insure that the proper level of escapement occurs.

Mixed Stock Fisheries

The subject of fishing on mixed stocks was discussed in great detail in the workshop. Discussion centered on whether it is best to limit fishing to the spawning period when stocks are separated into discrete units or to allow fishing when stocks are mixed. Also discussed were the impacts of mixed stock fishing.

The general consensus among the biologists present was that mixed stock fishing *per se* could not be viewed as detrimental to individual stocks or the well being of a group of stocks. In the Atlantic Ocean, herring are generally fished when stocks are mixed. Atlanto-Scandia herring are composed of Icelandic and Norwegian spawning stocks which are fished together. When stocks declined, the decline was equal in all stocks and independent of stock size. Canadian and U.S. herring stocks in the northwest Atlantic mix as adults off Nova Scotia and Maine and as juveniles mix along the New Brunswick coast. Year-classes in the different stocks fluctuate similarly, indicating that a mixed stock fishery does not affect stocks differentially.

In the northeastern Pacific Ocean, stock relationships are not clearly understood. Tagging studies of the herring reduction fishery in southeastern Alaska showed that fishing occurred on mixed stocks and that fishing mortality was often disproportionate among the stocks, but no indications of stock decline were evident. In British Columbia, scientists are uncertain of stock discreteness, since evidence indicates that 25% of the herring population stray between stocks annually. The greatest amount of mixing is between stocks spawning within the same general area, but large stock composition changes have been documented. They feel that if small stocks are overexploited, an accretion may occur from other stocks.

Conditions under which mixed stock fishing could have deleterious impacts were discussed. The primary conditions appear to be when small local stocks are available in conjunction with a larger migratory stock. Overfishing of the smaller stock can occur if fishing commences prior to the arrival of the larger stock. Also, it was noted that for migrating stocks fishing rates are more evenly distributed at greater distance from spawning grounds, and that the likelihood of exceeding the desired level of harvest in small stocks increases as herring migrate to the spawning grounds. However, studies of Atlantic stocks have indicated that migrational distance varies with stock size, that small stocks migrate less than larger stocks, and that migrational patterns can alter.

The general concensus of the workshop was that in a mixed stock fishery, the percentage removal is related to the percentage of mixing of the stocks, and that if management objectives are for a general level of exploitation, then underfishing of the smaller stocks is as likely as overfishing.

Juvenile Fisheries

The harvesting of juveniles was brought out during discussions of mixed stock fisheries as an aspect of mixed fisheries that could have serious detrimental impacts on the resource. Scientists working with north Atlantic stocks were unanimous in pointing out that fisheries conducted on juveniles, or large juvenile bycatches in adult fisheries, can rapidly deplete a herring stock. Herring fisheries in the Gulf of Maine were primarily juvenile fishery for over one hundred years; in the 1960's a large scale adult fishery began, and stocks rapidly declined under the combined fisheries. The recent depletion of North Sea and Atlanto-Scandia stocks were also largely due to juvenile and adult fisheries, but these juvenile fisheries were added to established adult fisheries.

Even if directed juvenile fisheries do not occur, incidental juvenile harvests can pose a potential problem. Care must be taken in analyzing juvenile incidence rates, for even though it may comprise a small percentage of tonnage caught, the loss in numbers of herring and potential growth may equal or exceed the yield possible had the juveniles survived to maturity. It was also stated that harvests of juveniles in a trawl fishery may only be a minimum estimate of total mortality as a high proportion of juveniles may pass through trawl nets and suffer high mortality rates.

A solution to controlling incidental catches of juveniles is to close areas of high juvenile-adult mixing. This problem exists in the Barents Sea capelin fishery and the Icelandic cod fishery, and area closures have been effective in both cases in reducing juvenile fishing mortality. It was also suggested that in cases where catches could not be controlled by area closure, the impact of juvenile harvests could be lessened by reducing the overall rate of fishing mortality.

Impacts of Fishing on Spawning Grounds

The subject of impacts on the resource from fishing on the spawning grounds was discussed; however, most of the discussion was general and speculative, owing to a lack of specific impact data. In some North Atlantic stocks, it was felt that fishing on the spawning grounds disrupted spawning behavior and caused reduced rates of reproduction. In the North Sea, the first declines in stock abundance were associated with fishing on spawning grounds in the southern North Sea. Closures made in the Barents sea to protect capelin spawning were reported to be based on evidence that fishing activity has interfered with capelin spawning migration and inhibited movement to coastal spawning sites. British Columbia scientists have not found any definitive impacts of fishing on the spawning grounds, since they have found fished and unfished stocks to exhibit similar behavioral patterns. However, they cautioned that gear losses on the grounds could cause problems. A specific concern was possible continued fishing by lost gill nets. They felt that the problem may be severe if more than one gill net is fished. With more than one gill net, unattended nets may fill with fish and sink, and possibly continue to fish.

Allocation Between User Groups

Allocation of a stock between user groups was found to be primarily a concern in western North America, and chiefly directed toward allocation between purse seine and gill net roe fisheries. Various allocation schemes are utilized from a court mandated 50:50 allocation in Washington between Indian and non-Indian fishermen, to a 55:45 allocation between purse seine and gill net gear in British Columbia based on economic analysis. Most allocations are made by stock, but in British Columbia the allocation is a coastwide average with some stocks exclusively gill net, and some exclusively purse seine.

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September 22, 1980

Mr. Clement V. Tillion
Chairman
North Pacific Fishery Management Council
P. O. Box 3136 DT
Anchorage, AK 99510

Re: Herring FMP

Dear Clem:

I want to take this opportunity to express our strong concern over the lack of a reasoned balance in the continuing debate over allocation of the Bering Sea herring stocks, and in particular the negative impact that refusal to recognize the legitimate rights of high seas harvesters of herring is having on the overall development of Bering Sea fishery resources by American fishermen.

As you are aware, our Company, together with a number of American trawler skippers has been eager and willing to make a major commitment to expanding domestic participation in the Bering Sea fisheries. Our commitment to this goal, which by law should also be one of the Council's goals, is underscored by the 24,000 metric tons of Bering Sea bottomfish we harvested this year in our two experimental fisheries -- our winter/spring fishery for cod and pollock, and our summer/fall fishery for yellowfin sole.

Although 11,300 tons were taken during the course of our winter/spring fishery directed at cod and pollock, in actuality the fishery was not particularly profitable for any of the participants. This unfortunate situation was due in part to the court order which resulted in herring being temporarily declared a prohibited species because of some procedural irregularities in the promulgation of the PMP. (Ironically this negative declaration was not based on any concern for the health of the resource as the Council and NMFS had found the herring resource to be capable of supporting a modest high seas fishery.) As it turned

out, without the revenues which would have been generated by the inclusion of some herring in our deliveries, the fishery was not profitable.

Based on this experience, we made plans to initiate a pollock fishery again this fall with the expectation that some herring would be available for a high seas domestic fishery. Then ADF&G observed substantially less herring on the spawning grounds this spring than they did in 1979, indicating to them that the herring resource may be declining. To help shed some light on this critical situation, we proposed to modify our operation so as to permit the collection of much needed data on the age structure and high seas distribution of the herring resource. Unfortunately, for reasons not related to the proposed research plan, we failed to receive the endorsement necessary to proceed.

Due to non-tariff trade barriers, our Company is unable to sell pollock in certain Far Eastern domestic markets (e.g. ROK). This limits our market opportunities with regard to pollock and makes it mandatory that we have other higher valued species (e.g. herring) included in the catches to allow us to mount a profitable fishery.

Unfortunately the question of a high seas herring fishery has still not been resolved. Herring is considered a prohibited species under the existing PMP which means we cannot retain it aboard our processing boats. As mentioned above, due to limited market opportunities for pollock, without herring we cannot organize a profitable fall pollock fishery. Consequently, we have had to abandon our plans for any bottomfish operations in the Bering Sea this fall. Furthermore our late winter/spring Bering Sea fishery is still up in the air pending an equitable resolution of the herring allocation issue or the elimination of certain non-tariff trade barriers so we can offer a stronger market for pollock.

The above-mentioned turn of events is unfortunate given the need for expanded markets for our growing high seas fleet. For this reason we hope that in considering the herring allocation issue the Council will take into consideration the legitimate rights of <u>all</u> harvesters of this valuable resource. Moreover, we ask that you take into consideration the importance of a high seas herring allocation in supporting the development of a domestic pollock fishery in the Bering Sea.

We agree that the subsistence needs should be given a high priority. The stated goals and objectives of the Draft Herring FMP give second priority to the inshore sac roe fishery because of the higher economic value of spawning herring and the lack of information on stock distribution in offshore waters. Conditions have changed since these goals and objectives were written. Had U.S. fishermen working with us in the Bering Sea in January-April 1980 been allowed to deliver herring to our processors, they would have received a 50% higher value per ton than fishermen did receive during the later sac roe herring fishery. The market value for roe herring is obviously less stable than that for food herring. Additionally our proposed fishery provides the platform for stock research which is so critically needed. Therefore, we cannot agree with an allocation scheme that would favor the inshore sac roe fishery to the exclusion of a high seas food fishery for herring.

Sincerely,

Walter T. Pereyra
Vice President and General Manager

WTP:kb

cc: Terry Leitzell
Bob McVey

BEFORE THE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

In the Matter of the Petition for an Amendment to the Preliminary Fishery Management Plan for the Trawl Fisheries and Herring Gillnet Fishery of the Eastern Bering Sea and the Northeast Pacific Ocean	)

To: Executive Secretariat
National Oceanic and Atmospheric Administration
Main Commerce Building
Washington, D.C. 20230

1. Petitioners are the following organizations and villages of southwestern Alaska: City of Chevak, City of Eek, City of Goodnews Bay, City of Hooper Bay, City of Kipnuk, City of Mekoryuk, City of Newtok, City of Nunapitchuk, City of Platinum, City of Quinhagak, City of Toksook Bay, City of Tununak, City of Scammon Bay, Indian Reorganization Act (IRA) Council of Kwigillingok, Traditional Council of Kongiganak, Lower Yukon Fish and Game Advisory Committee, Lower Kuskokwim Fish and Game Advisory Committee, Central Bering Sea Fish and Game Advisory Committee, Stoknavik Fishermen's Cooperative, Nunam Kitlutsisti, Inc., and the Association of Village Council Presidents, Inc.

2. The petitioners, pursuant to NOAA Directive 21-24, entitled "Procedures for Development of Regulations", hereby petition the National Oceanic and Atmospheric Administration to undertake rulemaking by publishing for public comment and review the following amendment to regulations implementing the Preliminary Fishery Management Plan for the Trawl Fisheries and Herring Gillnet Fishery of the Eastern Bering Sea and the Northeast Pacific Ocean:

"A new 50 CFR 611.93(d)(2)(iii) is promulgated as follows:

> From October 1 to March 31 in the "Winter Salmon/Herring Savings Area" which is the area enclosed by that Portion of the Fishery Conservation Zone encompassed within Groundfish Regulatory Areas of the Bering Sea/Aleutian Island Region Nos. I and II. See Figure 16, 42 FR 9328 (February 15, 1977) and Figure 2, 50 CFR 611.9."

3. Petitioners are interested in this matter by virtue of the following facts:

a. Petitioners represent residents of villages located on the coast of the Bering Sea and along the Kuskokwim and Yukon Rivers in southwestern Alaska. Most residents of these villages are subsistence and commercial fishermen who harvest king salmon and herring from the eastern Bering Sea. The petitioners have expressed their extreme concern to the North Pacific Fishery Management Council and the National Marine Fisheries Service about the interception of king salmon in the eastern Bering Sea by the foreign trawl fishery. But for their interception by the foreign trawl fishery, the intercepted salmon would be harvested inshore by residents of villages represented by petitioners.

b. Petitioners have testified before the North Pacific Fishery Management Council and have submitted comments to the National Marine Fisheries Service concerning the interception of king salmon and herring in the Bering Sea. Petitioners have submitted a proposed amendment to the Fishery Management Plan for the Bering Sea/Aleutian Island Goundfish Fishery to the North Pacific Fishery Management Council which is identical to the amendment to the Preliminary Fishery Management Plan set forth in the

instant petition.

4. Petitioners submit the following information in support of the proposed amendment:

a. Because of the salmon interception issue and the re-drafting of the environmental impact statement, the Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish Fishery will not be approved, and no regulations implementing the plan will be promulgated by the Secretary of Commerce, until 1981.

b. This petition is based upon new information received by the petitioners and the North Pacific Fishery Management Council at the council meeting on July 24-25, 1980. As a result of this new information, the Fishery Management Plan now being reviewed by the Secretary of Commerce is already out of date. The new information is set forth in Attachment #1 and details the dramatic increase in the incidental catch of king salmon in the Bering Sea during the first and fourth quarters of the calendar year. Although they are classified by the National Marine Fisheries Service as a prohibited species, approximately 107,000 salmon, 93% of which are of western Alaska origin, have recently been taken in the Bering Sea by the foreign fishing fleet.

c. The North Pacific Fishery Management Council has included the amendment proposed here by petitioners in its amendment package to the Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish Fishery. Unfortunately, the council's amendment package cannot be approved or implemented until after the conclusio of the 1980-81 winter groundfish fishery in the Bering Sea. Consequently, unless the proposed amendment is now adopted as a result of the instant petition, the unacceptably high level of interception of western Alaskan king salmon will continue unabated (See Attachment #1, p. 2).

d. Based upon observer coverage for calendar year 1979, approximately 92% of the known interception of king salmon in the Bering Sea can be eliminated during 1980-81 by the closure of Groundfish Regulatory Areas Nos. I and II from October 1 to March 31. (See Attachment #1, Attachment #2, p. 2).

e. The best available information indicates that nearly 100% of the king salmon intercepted in 1979, and which will be intercepted during 1980-81 if the proposed amendment is not adopte are from western Alaska stocks which would otherwise be harvested for subsistence and commercial purposes by fishermen represented by the petitioners. Assuming an annual mortality rate ranging from 15% to 34%, the 100,129 king salmon intercepted during 1979 represent a loss to western Alaska fishermen of between 46,000 and 86,000 fish. Attachment #1 indicates a range of loss of between 67,000 and 68,000 fish. Assuming a cash value of $ 1.00 per pound and an average weight of 24 lbs., the total economic loss to western Alaska fishermen is $ 1,620,000, and the per capita loss to each of the approximately 2,610 individual fisherme (850 fishermen on the Kuskokwim River, 1,000 fishermen on the Yukon River, and 760 fishermen in Nushagak/Togiak) is $ 620.00, a siginificant sum to families residing in the most cash poor region of Alaska.

f. Unless curtailed by the adoption of the proposed amendment, the unacceptably high level of salmon interception may also have an adverse effect on the king salmon resource itself. Due to a variety of unique circumstances (e.g. no smolt indicies, sil load prohibiting visual observation, the magnitude of watersheds, limited manpower, weather constraints on aerial escapement surveys the limited number of counting towers, inadequate funding, and the lack of egg/fry survival rate surveys) salmon biomass cannot be accurately predicted in western Alaskan streams. Consequently the level of interception by mothership and land based distant

sea fisheries of Japan, coupled with inadequate observer coverage, compound the conservation and management problems associated with the high level of salmon interception within the fishery conservation zone, and further compromise the ability of resourse managers to determine the number of king salmon which can safely be taken by the subsistence and commercial fisheries in western Alaska. (See Attachment #2).

g. And finally, the closure of Groundfish Regulatory Areas Nos. I and II also will eliminate the interception of overwintering eastern Bering Sea herring. The regulations implementing the Preliminary Fishery Management Plan (hereinafter "PFMP") which are the subject of this petition were challenged in a lawsuit filed in the United States District Court for the District of Alaska entitled, Napoleon v. Hodges, Civil Action No. A80-005. The petitioners herein were the plaintiffs in that litigation. The Court held that the regulations for foreign fishing for eastern Bering Sea herring were void, and, as a result, herring is now classified as a prohibited species in the Bering Sea. 45 F.R. 15933 (March 12, 1980). No new regulations to implement the herring portion of the PFMP have been proposed by the Secretary of Commerce. However, even though eastern Bering Sea herring are now ostensibly protected, preliminary estimates of the Alaska Department of Fish and Game indicate that the spawning biomass of eastern Bering Sea herring dropped from a range of 258,079 to 637,583 metric tons in 1979 to a range of 82,000 to 183,000 metric tons in 1980. Adoption of the proposed amendment will provide additional protection to over exploited stocks of eastern Bering Sea herring.

ARGUMENT

Foreign fishing within the fishery conservation zone in the Bering Sea must be consistent with the provisions of the Fishery

Conservation and Management Act, 16 U.S.C. 1801(c)(4), (hereinafte the "FCMA"). And continued fishing allocations to a foreign natio are contingent upon the nation's continued cooperation with United States enforcement, conservation, and management efforts, 16 U.S.C 1821(c)(3). In the instant case, the level of interception of king salmon in the Bering Sea is patently inconsistent with foreign fishing regulations promulgated by the Secretary of Commerce pursuant to the FCMA, as well as with the conservation of the king salmon biomass.

The proposed amendment will close a portion of the Bering Sea to foreign trawling during the first and fourth quarters of each calendar year. 92% of the salmon interception has occurred within the area of the closure, as has 100% of the herring interception.

Such a closure is necessary because although each foreign fishing vessel in the Bering Sea is required to minimize its catch of prohibited species, including king salmon and herring, 50 C.F.R 611.13, the incidental catch of king salmon did not diminish durin 1979, it doubled in size from the level of incidental catch recorded during 1978. Obviously, the foreign fishing fleet is <u>not</u> attempting to minimize its interception of salmon through voluntary action. Consequently, adoption of the proposed amendment is not only a timely response to a critical management problem, it is arguably a mandatory administrative action necessary to achieve the goals of the FCMA. It also should be noted that the dramatic increase in the level of interception is based upon statistical data gathered from vessels with almost nonexistent observer coverage, and, consequently, such data must be considered extremel conservative. The actual level of interception may be significant higher than is even indicated in Attachment #1, and the necessity for adoption of the proposed amendment also even more compelling than petitioners' arguments based upon existing data.

The FCMA provides adequate statutory authority for adoption of a regulation such as that proposed by petitioners, closing area of the Fishery Conservation Zone to foreign fishing, 16 U.S.C. 1821(h)(4)(c), 16 U.S.C. 1853 (b)(2). Further, while regulations implementing the PFMP must be consistent with the national standards set forth in 16 U.S.C. 1851(a),[1] absent adoption of the proposed amendment the regulations now in effect are inconsistent with at least five of the national standards.

National standard #1 requires conservation and management measures to prevent overfishing while achieving the optimum yield from each fishery. Overfishing is defined as a level of fishing which results in a reduction in the capacity of a management unit to produce maximum biological yield on a sustained yield basis. 50 C.F.R. 602.2(b)(1). In the instant case interception of king salmon within the closure areas which will be established by adoption of the proposed amendment is unacceptably reducing the capacity of western Alaska king salmon stocks to produce maximum biological yield on a sustained yield basis due to the high level of interception of females. Because of the unhealthy sex ratio within the stock of up to one female for every seven males, the Alaska Department of Fish and Game has not permitted an optimum yield harvest level in the king salmon fishery on the Kuskokwim River. The level of interception of females within Regulatory Areas Nos. I and II is a significant factor which has reduced the ability of the king salmon stocks to produce maximum biological yield. See Attachment #2.

Conservation and management measures also must be based on the best scientific information available. See National Standard #2. In the instant case the best scientific information available is the information set forth in attachments #1 and #2. This in-

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1. See Maine v. Kreps, 563 F.2d 1052, 1056 (1st Cir. 1977).

formation was not available to either the petitioners or the North Pacific Fishery Management Council until late July 1980. As better data becomes available the Council is required to modify its Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish Fishery, 50 C.F.R. 602.2(c)(3), and has initiated steps to do so in the instant case. National standard #2 compels the Secretary to adopt a similar approach with respect to the implementation of the PFMP. Indeed, to ignore this new information and permit a level of salmon interception to continue which the Secretary now knows is unreasonable would be a clear violation of this important national standard.

National standard #3 requires individual stocks of fish to be managed as a unit throughout their range and interrelated stocks to be managed as a unit or in close cooperation. 50 C.F.R. 602.2 (d)(1). Since it is a prohibited species, this national standard requires that salmon be managed so as to prevent any fishing, much less the near unbridled level of interception which has been at least tacitly condoned by the existing regulatory scheme. If the proposed amendment is not adopted, the existing regulatory scheme will continue to permit the harvest of large numbers of king salmon throughout their range pursuant to what is in reality no management whatsoever.

It also should be emphasized that whatever management techniques are employed to minimize the interception of king salmon must be effective. 50 C.F.R. 611.13. A 140% increase in the level of interception of a prohibited species in one year (1978 to 1979) unequivocally demonstrates the ineffectiveness of the existing regulatory scheme, and compels adoption of the proposed amendment.

National standard #5 requires efficiency in the fishery without making allocations based upon economic considerations alone. Obviously, permitting a year-around fishery within Regulatory Areas

No. I and II promotes a greater degree of efficiency in the foreign groundfish fishery than a closure of these ares during the winter months. However, efficiency in utilization of a fishery is intended to be a consideration only to the extent practicable, and must be weighted against other objectives of the FCMA. 50 C.F.R. 602.2(f)(2).

With the exception of the conservation of the fishery resources themselves, the major objective of the FCMA is to encourage the maximum development of the domestic fishery. In the instant case, permitting the foreign fishery to continue to fish within Regulatory Areas Nos. I and II during the periods during which the proposed amendment would close the areas to fishing, subordinates the development of two domestic fisheries to the convenience of the foreign groundfish fishery. As a result of the interception of salmon on the high seas, the established subsistence and commercial in-shore domestic salmon fishery has been forced to reduce its take below the domestic capacity to harvest and process fish. See Attachment #2. The development of the in-shore domestic herring fishery, an important goal of the North Pacific Fishery Management Council, also is adversely affected by the foreign groundfish fishery within the proposed closure areas.

And perhaps most significantly, adoption of the proposed amendment will not compromise the efficiency of the groundfish fishery. A TALFF fulfilled is a TALFF fulfilled. If the proposed amendment is adopted the TALFF can easily be harvested within the regulatory areas unaffected by the amendment, and within the affected areas during the time periods they are open to the groundfish fishery. Consequently, at worst adoption of the proposed amendment will result not in inefficiency in the groundfish fishery but rather merely in some moderate inconvenience to some foreign participants in that fishery. A result which on balance is con-

sistent with the goals of the FCMA, including national standard #5.

And finally, national standard #6 requires that conservation and management measures take into account variations and contingencies in regard to fisheries and fishery resources. The PFMP is presently inconsistent with this standard in that it does not reflect the dramatic increase in the level of interception of salmon in the Bering Sea or the equally dramatic reduction in the eastern Bering Sea herring biomass. Both developments require an immediate regulatory response. Consequently, adoption of the proposed amendment will conform the PFMP and its derivative regulations to the requirements of this national standard. See 50 C.F.R. 602.2(g)(2).

CONCLUSION

For each of the reasons set forth above, the petitioners respectfully request the National Oceanic and Atmospheric Administration to publish the proposed amendment in the Federal Register for public comment, and again as a final regulation in order that the interception of king salmon and herring by the foreign groundfish fishery will be minimized during the winter groundfish fishery which commences the beginning of October.

DATED at Anchorage, Alaska, this 16th day of August, 1980.

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