North Pacific Fishery Management Council

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SSC MINUTES
May 19-21, 1985
Anchorage, Alaska

The Scientific and Statistical Committee of the North Pacific Fishery Management Council met in Anchorage on May 19-21, 1985. Members present were:

Richard Marasco, Vice-Chairman
Donald Bevan
Tom Northup
Bud Burgner
Doug Eggers
Larry Hreha
John Burns
Scott Marshall
William Aron

D-1 Salmon FMP Amendment

The SSC feels that, while questions and issues listed in the May 15, 1985 Branson memorandum are relevant, it is difficult to either address or answer some of them without knowing what course salmon management will take once the U.S./Canada Treaty is made operational. In our opinion, any attempt to rewrite the FMP at this time would be premature. While it is clear that the Treaty implementing legislation contemplates Council participation in the salmon management process, more guidance is required before taking action.

D-2 Gulf of Alaska Groundfish FMP

I. Amendment 14

The following documents were used by the SSC in reviewing the eight issues addressed in this amendment package:

1. Overview of Comments by Issue
2. Public Comment Summary
3. Draft Regulatory Impact Review/Initial Regulatory Flexibility Analysis: Part I Sablefish Management and Gear Regulations May 1985
4. Draft Regulatory Impact Review/Initial Regulatory Flexibility Analysis: Part II May 1985
5. Draft Environmental Assessment

The SSC found all these documents helpful during its review of the amendment. All the individuals involved in the preparation of these documents should be commended for their efforts.

1. Establish a gear and/or area restriction in the sablefish fishery.

An excellent statement of the problem currently associated with the Gulf of Alaska sablefish fishery is given on page 9 of the May 1985 RIR:

> "The Alaska sablefish fishery has undergone a very rapid transformation, within little over a year's time, from a foreign- dominated fishery to a fishery fully-utilized by domestic fishermen, and which will, in the near future if left unregulated, experience serious problems with gear conflict and excess effort."

To facilitate development of management options, the Team developed four objectives. These objectives appear on page 10 of the May 1985 draft of the RIR. While recognizing the importance of having specific objectives in the amendment development process, the SSC has several concerns over the current set. First, and perhaps most important, is the lack of an objective that recognizes that the sablefish fishery takes place in a multi-species/multi-fishery environment. This being the case, management measures developed for the fishery must take into account the impact any such action will have upon other fisheries that occur in the area. The Gulf is currently experiencing rapid expansion of a domestic trawl fishery. For any analysis to be considered complete, the issue of how various management measures under consideration would affect the trawl fishery must be considered. To ensure that full benefits are realized from the use of all fishery resources located in the Gulf, it is critical that this issue be addressed. Second, stated in objective 1 is the concern over ensuring an equitable distribution of access to the sablefish resource among different gear types. It is noted that a definition of what is meant by equitable was not given in the RIR. This makes it difficult to know what is implied by this objective. Lastly, objective 2 makes reference to the reduction of negative economic impacts on local communities. The question asked is, "The negative economic impacts of what activities?"

Deficiencies associated with the objectives specified for this amendment issue made it difficult for the SSC to evaluate the management measures proposed. If objective 2 is taken to mean protection of the share of the sablefish resource taken by fishermen in various communities that are economically dependent upon the sablefish fishery, a quick examination can be made of the ability of options discussed in the RIR to lead to achievement of Objectives 2, 3 and 4. The table below provides an indication of the type of impact options under consideration will have upon these three objectives. A negative sign indicates that the option will have either no effect or an unfavorable one; while, a positive sign indicates that the impact will more than likely be positive.

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	OPTION					
OBJECTIVE	Status Quo	Quota Allocations by gear type	Area Closures for various gear types	Cap on #s of vessels	Cap on #s of either pot or longline vessels	License limitation
Protect Local Community Catch Shares	-	-	-	-	-	-
Limit Concentration of Incompatible Gear Types	-	-	+	-	-	-
Prevent Excess Capacity	-	-	-	+*	-	+*

* Impact is dependent upon the type of program used. It is assumed that the system is designed to prevent expansion of all factors of production.
\+ Indicates favorable impact.
\- Indicates either no or negative impact.

As indicated by this table, none of the options are capable, individually, of leading to the realization of all of the objectives. Three of the options, status quo, quota allocations and a cap on a selected gear type, will either have no effect or a negative one. Area closures will limit the conflicts between incompatible gear types. The Benefits that stem from the reduction of the number of conflicts between different gear types will disappear as the amount of effort expands. Both a cap on the number of vessels allowed in the fishery and license limitations are capable of preventing unconstrained effort expansion if properly designed. However, neither option does anything to prevent gear conflicts. It should be noted that none of the options do anything to protect local community catch shares. Community share protection requires very specific quota allocations.

In short, the SSC feels that adoption of any of the measure under consideration will yield only limited short-term benefits. Rational management of the sablefish fishery must consider effort limitation.

Lastly, the SSC was given a report that summarized the results of a study which was undertaken to determine how sablefish management might affect

community employment. The results of this study are given in "Employment Impacts of Changing Sablefish Harvests" by Douglas M. Larson and Biing-Hwan Lin. The SSC did not have adequate time to review this document. The SSC does wish to caution the Council with respect to using the results of this study. Though the study indicates that there have been reductions in hours worked and employment at Southeast Alaskan processing plants, none of the management measures being considered appear capable of preserving community shares of the sablefish catch.

2. Establish rockfish areas/quotas and OY.

The SSC suggests a Gulfwide OY for other rockfish be set on the basis of historical catches with allowance for expansion of domestic groundfish fisheries. Examination of catch data indicate that the average 1982-1984 joint venture and foreign fisheries harvest was about 1,500 mt. The recent harvest of the domestic fishery was 800 mt. Summing these two values yields 2,300 mt. The addition of 2,700 mt to allow expansion of domestic fisheries yields an OY of 5,000 mt. The SSC wishes to note that only limited information is available on the abundance of these stocks. There is some feeling that these stocks may not be capable of supporting catches at the proposed OY level. While it has been suggested that the Gulfwide OY be subdivided, the SSC notes that there is no scientific basis for division at this time.

With respect to the demersal rockfish found in the area of exploitation near Sitka, these stocks were not included in the determination of the OY specified in the plan. Information on the status of stocks in Sitka Sound leads to concern over their ability to withstand increased levels of fishing or perhaps over the ability to maintain present levels. We recommend a limit of the present catch level (600 tons) be placed on the area of present catches of demersal rockfish (56°N latitude - 57°30'N latitude). Since this group was not counted in the original FMP OY determination, they can be considered separately. The demersal species in the remainder of southeastern do not warrant special attention at this time and can serve to supply the fishery when the 600 ton quota closes Sitka Sound.

The suggestion for a change in the accounting year will not provide a solution to the perceived problem of a late fall closure without a concurrent change in the season. No economic data was provided in support of this proposal. We suggest that price information on Alaska rockfish be collected and entered into the PACFIN data system to allow analysis of such proposals.

Rockfish market price trends on the Pacific coast support the idea that a closure, if needed, should be in the summer time when price often drops. This should not be a problem in Southeast, at least for this year, since the demersal fishery can move to other areas if a quota is reached in Sitka Sound.

3. Implement new optimum yields for pollock, Pacific ocean perch, Atka mackerel and other species.

Pollock

The SSC recommends that harvest levels not exceed 305,000 mt in the Western and Central areas combined. The 1984 OY of 400,000 mt was set using cohort

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analysis of the 1976-82 catch-at-age data. The 1982 exploitable biomass was 2.6 million mt. The 1984 hydro-acoustic trawl survey estimated the exploitable biomass at 1.7 million mt and the March 1985 survey projected about 1.2 million mt.

The 1982 year class was the third consecutive failure, the 1983 year class is average to good, and preliminary indications are that the 1984 year class is good. It was noted that while CPUE in the 1985 Shelikof fishery remained steady, the fish occupied relatively smaller areas of concentration and reduced depth of schools within the water column.

In December 1984 the Team provided a forecast of the exploitable biomass for different levels of harvest for different recruitment values. The worst case showed that a harvest of around 300,000 mt in 1985 would require a substantial reduction in the 1986 harvest to prevent depleting the stock to a level where recovery would be hindered.

Pacific ocean perch

The SSC reiterates its position stated in December 1984 that POP stocks remain at low level and OY should be set at bycatch levels only. The SSC notes that in recent years catches have remained below current OY and there is no evidence that POP stocks are yet rebuilding.

Atka mackerel

The 1984 trawl survey indicated that the total biomass was 1,000 mt in the Central area and no fish were found in the Eastern area. There was no apparent recruitment in the Central area. The 1984 OYs were 20,836 mt in the Central area and 3,186 mt in the Eastern area. In December 1984 the SSC supported the Team recommendation that the harvest levels be set at bycatch levels only in the Central and Eastern areas. The Council, by emergency order, subsequently established OYs of 100 mt in the Central area and 10 mt in the Eastern area to provide for an Atka mackerel bycatch. Because these numbers were extremely small, NMFS adjusted the OYs for these areas to 500 mt and 100 mt respectively to minimize the chance of operational problems. The SSC notes that a 500 mt OY for the Central area constitutes a 50% harvest rate. However, it is recognized that there is not a high degree of confidence in the biomass estimate.

Other species

The SSC recommends that the Council maintain the present framework approach.

4. Establish a reporting system for catcher/processors.

A report was given by Council and NMFS Regional staff describing reasons why this issue was included in the amendment package and the options under consideration. Catch reports from vessels included in this category currently are submitted upon returning to port. These reports represent the results of several months of fishing. Characteristics of the catch reporting process used by these vessels make it difficult to monitor catches of target species in a timely fashion. Additionally, there is no method for determining the incidental catch of prohibited species.

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The lack of near real-time catch data could result in catches that exceed established quotas. Further, without timely data, reserve allocation decisions could be made that would impede operation of domestic fisheries. These factors and the recognition that effective management requires the monitoring of all sources of fishing mortality necessitates implementation of a reporting system that supplies timely catch data.

The SSC prefers the alternatives that use observers because of the desire to monitor bycatch and prohibited species catches. However, it is recognized that funds are not currently available for this type of program. We urge the Council to explore methods that could be used to fund an observer program. Until funds are obtained, the SSC recommends implementation of Alternative 2. This option requires that catcher/processor vessels obtain FCZ processing permits, notify NMFS via U.S. Coast Guard radio each time they enter or leave an FMP management area, and submit a report to NMFS by U.S. mail or telex for each fishing week documenting the hail weight estimates of catch by FMP species group in each FMP area. The SSC was concerned over the added burden imposed on fishermen by requiring written catch reports.

5. Establish closures to control the Pacific Halibut bycatch.

The SSC repeats its comment made to the Council in March 1985 that "It is difficult to imagine any real control over bycatch on a domestic vessel processing onboard or delivering to shore without an observer program." Of the alternatives suggested, Alternative 1 is based upon outmoded data and at present has no scientific validity. Alternative 4 is not legal under the Magnuson Act. It is possible that imposing costs on fishermen to handle and preserve halibut until delivered onshore to be used for charitable purposes might provide the same disincentive as a fee and yet be legal.

The new alternative suggested during the public comment period does not provide a means to get the incidental catch within the limits proposed. Alternative 2 provides a figure that will be valid only for a year and then require a new plan amendment. This leaves Alternative 3 as the only long-term, viable option. The SSC recommends the Council implement Alternative 3 with the inclusion of provisions that allow for:

a. a method for changing the areas for which PSC limits are established; and

b. allocation of PSC limits by area to individual operations, with individual PSC limits transferable (The method that will be used to make initial and supplemental allocation will be determined by procedures specified in the FMP).

6. Implement NMFS habitat policy.

In March 1985, the SSC recommended that the Habitat Draft Amendment not be a part of the fishery management plans, but instead be a separate document referenced in each plan that might be changed, without plan amendment, as new information became available. In specific, the SSC suggested adoption of the following habitat policy:

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"To assure the long-term productivity of the Bering Sea and the marine waters of the Aleutian Islands Archipelago (Gulf of Alaska), the Council will take all necessary and appropriate steps to prevent or minimize man-made environmental changes that have adverse ecosystem impacts. The Council will maintain a document which identifies the habitat requirements of all species managed by the Council and that identifies critical habitats and potential threats. This document will include a statement of actions that the Council will take to respond to man-made activities which could have adverse impacts on habitats. This document will be updated as needed."

The SSC in March had serious concerns over a number of omissions, ambiguities and inaccurate statements in the draft. It is recognized that since the last meeting NMFS staff has worked very hard to respond to our concerns. As a result, the present draft is a much improved version. However, we still believe that it needs further revision before we can recommend it be made a part of an FMP. It is our opinion that there is not sufficient time to accomplish the necessary revisions at this Council meeting. Some examples of changes we suggest be made are:

1. There is a need for additional citations and a more comprehensive bibliography that would lead to adequate detailed descriptions of the Gulf of Alaska (Bering Sea) region and resource characteristics.

2. A revision of the Research Needs section so that implied Council research priorities are not locked into a plan and to ensure that readers will not improperly construe the relative importance of biological, economic, social and habitat research.

3. The draft contains a number of examples of habitat alterations such as timber harvest in Tongass National Forest and Quartz Hill mine tailings. While these are examples of real environmental concerns, they have not been adequately connected in the draft to Gulf of Alaska groundfish resources. We suggest that such examples should not be in the FMP unless they have a potential to affect the habitat in a way that is harmful to the fishery resources being considered. A future revised draft should address the likelihood of occurrence of various activities that could have an adverse impact on the habitat and the expected intensity of the activity.

At this time, the SSC recommends the Council proceed with Alternative 1b, with the addition of the section that the Council staff has prepared on gear discharge. We have carefully examined the legal analyses of Alternatives 1 and 1b and believe most to be wise advice. Our suggestion for adoption of Alternative 1b meets all of the Council needs to seek habitat protection through non-regulatory means. Mr. Travers' report states that:

"The authority of the Council and NOAA to pursue the non-regulatory recommendations would probably not be affected in any significant way by the presence or absence of the habitat texts in the FMPs themselves. The advocacy and research activities treated in these recommendations are ones that do not depend upon the underlying authority of an FMP. In fact, many of them are the types of activities that any interested member of the public could undertake. Thus, the Council could adopt either of

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the two alternatives described above, or even the third, no action, without significantly affecting its ability to carry out the non-regulatory recommendations of the habitat texts."

We also agree that the exclusion of some of the habitat text would prevent the Council and NOAA from pursuing the types of regulatory actions described in the NMFS text. Travers further states:

"Thus, exclusion of the habitat texts from the FMPs themselves, as proposed under the second alternative, would prevent the Council and NOAA from adopting such regulations in the future without amendment of the FMPs."

We have examined the types of regulations suggested in the text, Section 8.10. The first, referring to halibut savings, is designed to protect halibut, not its habitat. The second we would classify as public health, pollution control or fish quality regulation. We recognize that under our proposal the Council would have to leave this kind of regulation to such agencies as FDA, EPA or state health authorities, unless the Council undertook a plan amendment. The third type of habitat regulation pertains to gear discharge and suggested language has been drafted for the appropriate amendment.

7. Sablefish fishing seasons

The SSC did not find major biological issues in this measure nor were any explored by the Team. There are several socioeconomic factors which tend to favor a later opening date, particularly since sablefish are a low OY species which can be harvested in a short time by the existing fleet.

Sablefish and halibut stocks intermingle during the proposed closure period, so halibut bycatch rates should be lower during the period being considered for opening of the fishery. Additionally, closing the winter months should result in less pot loss, hence less ghost fishing, because of better weather conditions during the months of March, April and May.

The pulse fishery, which will likely develop as a result of a later opening date, is already the trend under the current January 1 opening. While this measure promotes safety and improves product quality, it, like the proposed gear/area restrictions, is not a long-term solution to the major problem of the fishery, i.e. overcapitalization. A need greater than a measure to delay the season opening in this fishery is a set of measures to prolong the fishery, regardless of the starting date.

The SSC felt that there was no single compelling reason to either accept or reject this proposal.

II. Council Review of Draft Regulatory Amendment for Single Species OY.

The SSC was told by NMFS Region staff that the GOA groundfish FMP states that when the OY for any one of the species included in this Plan is taken, all fishing for other groundfish species must stop. Further, it was indicated that this regulatory option was being considered to prevent this from happening in the future.

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The four alternative changes under consideration are given in a discussion paper entitled, "Single Species Optimum Yield Closures" dated May 1985. Alternative 1 was identified as the SSC's preferred alternative. Alternative 4 was considered unacceptable since it would lead to a perpetuation of the problem. Alternatives 2 and 3 were discarded because the inability to control fishing mortality and potential monitoring problems.

D-2c Consider Emergency Action to Minimize Joint Venture and Foreign Interception of Salmon

A team report was given to the SSC that described both target and bycatches associated with the fisheries that are of concern. It was pointed out that an examination of historical catch data indicated that bycatch rates have been extremely variable in both the spatial and temporal dimension. Further, salmon bycatches in both the foreign and Shelikof Strait fishery have been low. For this reason, the SSC felt that these fisheries were not currently a source of concern. To ensure that this problem is addressed, the SSC suggests that the Council direct the remaining participants in the groundfish trawl fishery to get together to develop a plan to reduce the incidental salmon catch. One possible approach was brought to the attention of the SSC. This approach, which is described in "Bycatch in the Gulf of Alaska Pollock Fishery Focusing on Salmon Bycatch in Fall Pollock Joint Ventures" by S.M. Kaimmer, is worthy of consideration by the suggested workgroup. A quick examination of this report indicates that it contains some very useful information that could be used in the development of a management measure. The SSC suggests that the Council encourage industry to provide similar data and analyses to be used in the Council process. The SSC feels that the workgroup should be tasked with producing a plan prior to August 1, 1985. If a plan isn't developed, the SSC recommends that a PSC be implemented via emergency action. To facilitate the putting in place of a PSC limit, the SSC suggests that the Council direct the team to perform the appropriate analyses and calculate a PSC value.

D-3 Bering Sea/Aleutian Island Groundfish FMP

I. Amendment 9

The following documents were used by the SSC in reviewing issues contained in this amendment:

1. Amendment 9 Summary: Issues and Alternative Management Solutions
2. Overview of Comments by Issue
3. Amendment 9 Comment Summary
4. Draft Regulatory Impact Review/Initial Regulatory Flexibility Analysis May 1985
5. Draft Environmental Assessment March 1985.

The SSC found all of these documents helpful in its review of the amendment package. We feel that all parties involved in the preparation of these documents should be commended for their efforts.

1. Raise the upper end of the OY range.

Establishment of any OY level is largely accomplished for operational and socioeconomic purposes. The request for a change to increase OY from an upper

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1. Raise the upper end of the OY range.

Establishment of any OY level is largely accomplished for operational and socioeconomic purposes. The request for a change to increase OY from an upper

limit of 2.0 to 2.5 million metric tons was proposed to provide greater management flexibility with regard to setting TAC. The current OY of 2.0 million mt was purported to have constrained the groundfish fishery in three of the past four years. However, it was noted that those constraints were deliberately imposed.

History of catch in Bering Sea is known, as are resource responses to those catches. The OY range was related to historical performance. For the complex as a whole, the sum of EYs may never actually equal an established upper level of OY. At the 2.5 million mt level it is still not reasonable to expect achievement of the EY for each species. The reasonable expectation of combined catches will be around 2.0 million tons in the foreseeable future.

In the absence of a framework type plan that allows management flexibility, establishing the upper limit of OY at 2.5 million mt is acceptable from the standpoint of resource abundance. Such a change will probably not affect the TAC for several years.

The SSC's preferred future action would be to develop a framework amendment that includes provisions for management flexibility in line with abundance of the groundfish complex and its components.

2. Reduce the incidental catch of salmon in joint venture fisheries.

At the SSC's March meeting we pointed out that:

> ". . . no analysis is provided that indicates what the incidental salmon and other prohibited species bycatches would be in the areas into which the fleet could move when the area is closed. The SSC recognizes that the data are very limited for domestic operations in these other areas. However, it is felt that an examination of the foreign catch from these areas and comparison with the domestic experiences would provide useful insights. This analysis should include an examination of several years data. Past experience has indicated that there is a high degree of variability in incidental catches in time and space. This characteristic of incidental catches make it difficult to define a simple time/area closure which would solve a bycatch problem."

We feel that these comments are still valid.

The magnitude of the incidental chum salmon catch is not biologically significant given the information available at this time, though there is certainly a desire to reduce it to the lowest levels practicable.

We have no data to evaluate changes in either operational costs to the joint venture fleets that may be incurred by area closures, or reductions in incidental salmon catches that may be achieved.

The SSC feels that all of the proposed options are flawed. The closure proposed under Alternative 1 does nothing to ensure that salmon bycatches will be reduced. Alternative 2, while likely reducing the chum salmon catch in the area bound by 55°00'N latitude to 56°30'N latitude and 164°W longitude to 169°W longitude during the July 20 through August 25 time period, allows for the potential expansion of incidental catch of prohibited species in other

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areas. Alternative 3, while having some appeal, is not developed sufficiently to allow analysis or evaluation. Legal interpretation of the MFCMA indicates that Alternative 4 is not currently viable. Lastly, Alternative 5 would allow for further expansion of the incidental catch.

In light of the problems associated with the alternatives addressed in the RIR, the SSC recommends a two step approach to the resolution of this incidental catch problem. First, that industry groups be encouraged to meet immediately for the purpose of developing procedures to reduce incidental salmon catches in 1985 and 1986. Second, that the Council develop a more flexible framework type approach perhaps based on acceptable catch rates in line with status of the target and incidental species and impacts on domestic fisheries. The Team should be encouraged to look at the framework being proposed to address the halibut bycatch problem in the Gulf of Alaska.

3. Reduce the incidental catch of fully-utilized domestic species by foreign trawlers.

Review of the RIR has indicated that the Council's purpose for examining management options for the area identified as the Aleutian Island closure area (Figure 1) was to reduce the catch of fully-utilized species by U.S. fishermen in the Aleutian Islands.

Of the three options under consideration the SSC prefers Alternative 2, the status quo. The SSC notes that provisions of Amendment 1 of the Bering Sea/Aleutian Island groundfish FMP dated January 1, 1984 provides mechanisms that are adequate to address reduction of incidental catches of fully-utilized species. Closure of the area within 20 miles of the Aleutians to all foreign trawling, as proposed by Alternative 1, may not reduce the overall incidental catch of fully-utilized domestic species by foreigners, but rather displace some of it from the 20 mile zone. This is the case if TACs, and DAHs, are such that the resulting TALFFs for the Bering Sea do not represent binding constraints on the bycatches of the foreign fishing fleet. If TALFFs are binding, no increase would occur. However, there would be increased competition for these species between foreign fishermen.

With respect to Alternative 3, the SSC points out that the expressed problem deals with foreign trawlers. Establishment of zero TALFFs would eliminate use of all types of foreign fishing gear, not just trawls. If it is the Council's intent to set zero TALFF for species such as POP, Atka mackerel and sablefish, Amendment 1 allows this flexibility.

4. Require domestic catcher/processors to submit periodic catch reports.

The SSC discussed this issue, mainly with respect to the Gulf of Alaska. Reporting requirements for catcher/processors operating in the Bering Sea should be the same as for vessels fishing in the Gulf.

5. Implement the NMFS Habitat Policy.

The SSC recommends an approach identical to that taken on the similar policy that was proposed as part of Amendment 14 for the Gulf of Alaska Groundfish FMP.

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With respect to Alternative 2, the SSC points out that the expressed problem deals with foreign trawlers. Establishment of zero TALFFs would eliminate use of all types of foreign fishing gear, not just trawls. If it is the Council's intent to set zero TALFF for species such as POP, Atka mackerel and sablefish, Amendment 1 allows this flexibility.

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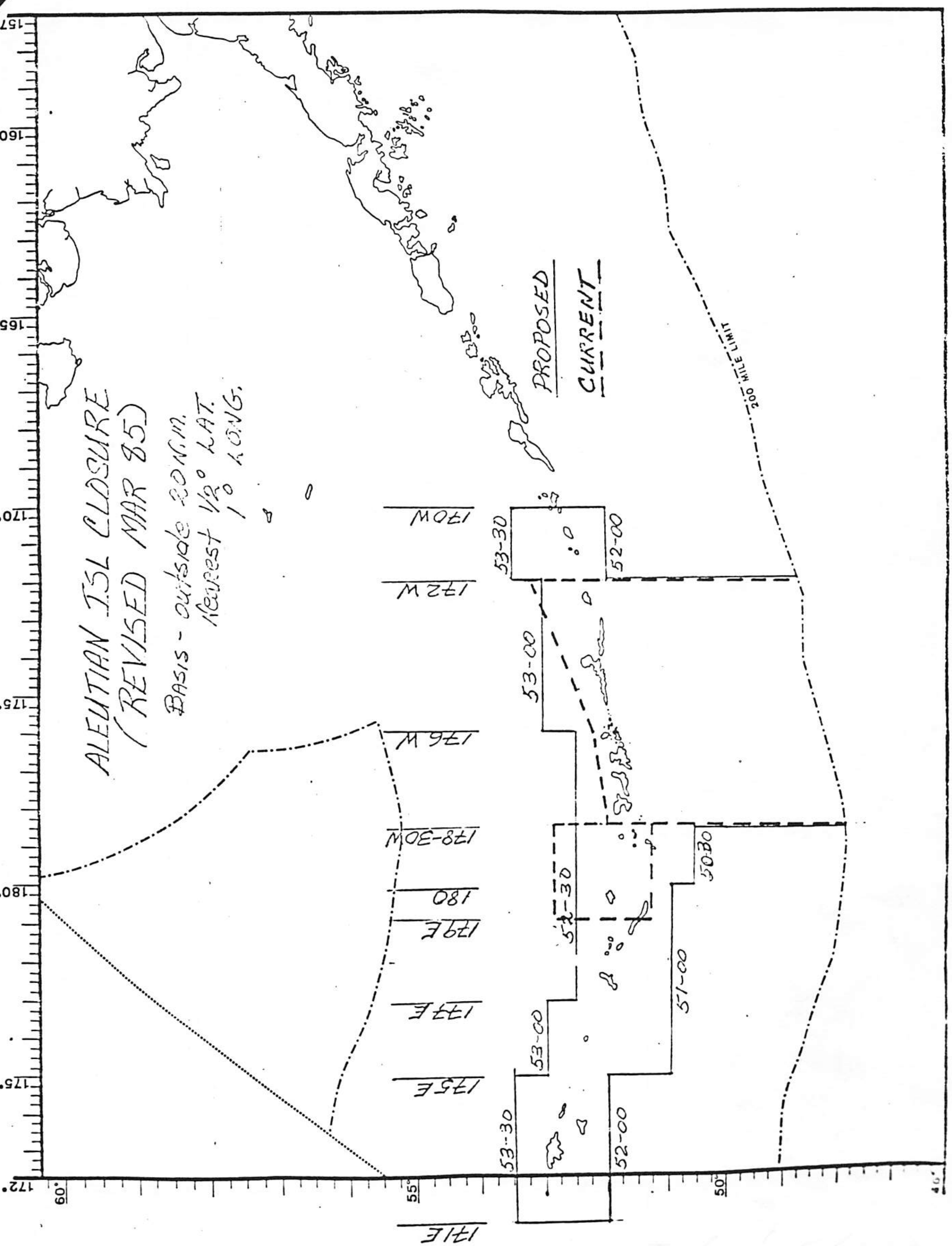

Figure 1. Proposed Aleutian Island Closure Area.

D-3c Emergency Rule to Minimize Joint Venture Salmon Interceptions

As indicated for Issue 2 of Amendment 9, the SSC recommends that the Council direct the appropriate industry participants to design a plan for reducing the bycatch in 1985. (See comments for Amendment 9, Issue 2.)

D-3d Protection of King Crab Aggregations

This information was an informational item only. The SSC was informed that the Plan Team was analyzing king crab bycatch data to determine if the Council's approach to controlling these catches should be changed.

D-3e Request from the Alaska Factory Trawlers Association for an Emergency Order to Reduce the Pacific Cod TAC from 220,000 mt to 132,000 mt.

The SSC reviewed the following documents that were associated with this request:

1. Interim Action Committee Teleconference Summary: May 14, 1985.
2. The letter to Jim Branson from Arctic Alaska Seafoods, Inc. providing data in support of the request.
3. An Evaluation of the Current Status of Pacific Cod in the Eastern Bering Sea prepared by the Northwest and Alaska Fisheries Center.

Data contained in these documents are in line with what was expected during 1985. The data indicate a reduction in abundance/biomass as indicated by Dr. Low at the December Council meeting. Further, additional reductions are expected as the strong 1977 year moves through the fishery.

Natural mortality rates associated with this stock coupled with the current age structure of the stock, preclude any significant increases in future CPUEs from a decrease in TAC such as the one being proposed.

E-1 Contracts and Programmatic Funds

(a) Contract 83-4: Joint Venture Trawl Logbook Program

A subgroup of SSC Members (Marasco) and Council staff has been formed and given authority to take action on this contract for the SSC.

(b) Contract 84-1: Sea Lion Pup Census

A subgroup made up of SSC Members (Burns and Marasco) and Council staff has been formed and given authority to take action on this contract for the SSC.

(c) Contract 84-3: Origin of Chinook Salmon - Part II

The draft final report for this contract was received too late to allow review. Committee members were requested to supply Marasco with their comments prior to the 15th of June. Marasco will see to it that comments received are given to the authors' of the report. Marasco and Marshall will be responsible for seeing if a revised report is required and that it receives review.

F-5c <u>Emergency Rule to Minimize Joint Venture Salmon Interceptions</u>

As indicated for Issue 2 of Amendment 9, the SSC recommends that the Council direct the appropriate industry participants to design a plan for reducing the bycatch in INPFC. (See comments for Amendment 9, Issue 2.)

D-5d <u>Protection of King Crab Aggregations</u>

This information was an informational item only. The SSC was informed that the Plan Team was analyzing king crab bycatch data to determine if the Council's approach to controlling these catches should be changed.

C-7a <u>Request from the Alaska Factory Trawlers Association for an Emergency Order to Reduce the Pacific Cod TAC from 120,000 mt to [illegible] mt.</u>

The SSC reviewed the following documents that were associated with this request:

1. Interim Action Committee Teleconference Summary May 14, 1985.
2. The letter to Jim Branson from Arctic Alaska Seafoods, Inc. providing data in support of the request.
3. An Evaluation of the Current Status of Pacific Cod in the Eastern Bering Sea prepared by the Northwest and Alaska Fisheries Center.

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(c) Contract 81-2: Origin of Chinook Salmon - Part II

The draft final report for this contract was received too late to allow review. Committee members were requested to supply Marasco with their comments prior to the 15th of June. Marasco will see to it that comments received are given to the authors of the report. Marasco and Terdell will be responsible for seeing if a revised report is required and that it receives review.

(d) Contract 84-6: Bering Sea Herring Scale Analysis- Part II

The SSC recommends approval of the final report for this contract and final payment.

(e) Review of Programmatic Funds

Council staff indicated that interest has been expressed in analyzing the stock composition of chinook and chum salmon caught by groundfish trawlers in the FCZ. In light of the importance of this issue, the SSC feels that this would be a rational way to spend FY86 programmatic funds if any are available.

North Pacific Fishery Management Council
Fishery Management Plan for the
Bering Sea/Aleutian Islands Groundfish Fishery

Outline for Habitat Sections of Amendment 9

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[9.0 Biological and Environmental Characteristics of the Fishery.]

9.1 Life History Features and Habitat requirements.
- 9.1.1 Walleye pollock.
- 9.1.2 Pacific cod.
- 9.1.3 Yellowfin sole.
- 9.1.4 Greenland turbot.
- 9.1.5 Other flatfishes.
- 9.1.6 Pacific ocean perch.
- 9.1.7 Other rockfishes.
- 9.1.8 Sablefish.
- 9.1.9 Atka mackerel.
- 9.1.10 Squid.
- 9.1.11 Pacific halibut.

[9.2 Stock Units. 9.3 Data Sources. 9.4 Quality of Data. 9.5 Ecological Relationships. 9.6 Current Status of Stocks. 9.7 Estimate of Future Stock Conditions.]

9.8 Description of Habitat Types.

9.9 Habitat Areas of Particular Concern.

* * * * * *

[10.0 Other Considerations Which May Affect the Fishery. 10.1 International Pacific Halibut Commission. 10.2 Marine Mammal Protection Act of 1972.]

10.3 Potential for Habitat Alteration.
- 10.3.1 Offshore petroleum production.
- 10.3.2 Coastal development and filling.
- 10.3.3 Marine mining.
- 10.3.4 Ocean Discharge and Dumping.
- 10.3.5 Derelict fragments of fishing gear and general litter.
- 10.3.6 Benthic habitat damage by bottom gear.

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[14.0 Management Regime.]

14.1 Management Objectives.
E. [Add habitat objective.]

* * * * * * *

[14.2 Area, Fisheries, and Stocks Involved. 14.3 Fishing Year. 14.4 Management Measures--Domestic Fishery. 14.5 Management Measures--Foreign Fisheries. 14.6 Operational Needs and Costs.]

14.7 Management Measures to Address Identified Habitat Problems.

* * * * * * *

16.0 Research Needs.
[Add text to first and before last paragraph.]

* * * * * * *

[18.0 References. 18.1 General.]

18.2 Literature Cited and Selected Bibliography for Habitat Sections 9.1, Life History Features and Habitat Requirements; 9.8, Description of Habitat Types; and 10.3, Potential for Habitat Alteration.

* * * * * * *

19.0 Appendices.

Appendix IV--Programs Addressing Habitat of Bering Sea/Aleutian Islands Groundfish Stocks.

A. Habitat protection: existing programs.

1. Federal legislative programs and responsibilities related to habitat.
2. Specific actions taken by the Council and NMFS related to habitat for the BS/A groundfish fishery.

B. Non-regulatory techniques to address identified habitat problems.

9.0 Biological and Environmental Characteristics of the Fishery.

9.1 Life History Features and Habitat Requirements. This section summarizes habitats and life histories of the different groundfish species of commercial importance in the Bering Sea. More detailed information can be found in the following: Bakkala and Smith (1978), Bakkala (1981), Best (1981), Carlson and Haight (1976), Carlson and Straty (1981), Garrison and Miller (1982), Gusey (1979), Hart (1972), Hood and Calder (1981), Lewbel (1983), Morris (1981), National Marine Fisheries Service (1979, 1980), Pereyra et al. (1976), Quast (1972), Smith (1981), Wilson and Gorham (1982), and Wolotira (1977).

9.1.1 Walleye pollock. This species is the most abundant species on the continental shelf, representing 20-50 percent of the total standing stock of groundfish. Pollock are found throughout the water column from shallow to deep water. Massive schools occur on the outer shelf and upper slope from the surface to 500 m. In the Eastern Bering Sea, walleye pollock undergo extensive seasonal migrations associated with feeding and reproduction. Overwintering takes place along the outer shelf and upper slope, and over deep water where bottom temperatures are relatively warmer. As temperatures on the shelf become warmer in spring, part of the walleye pollock population moves to shallower waters (90-140 m) where spawning takes place. They first reproduce at the age of 3 or 4 years. Spawning occurs from March through July along the outer shelf, with major spawning concentrations occurring between the Pribilof Islands and Unimak Island. Each female produces approximately 60,000-400,000 pelagic eggs. Walleye pollock eggs hatch in 2 to 3 weeks, depending on temperature; larvae remain in surface waters. Larval pollock begin feeding on copepod eggs and nauplii; as they grow, they feed successively on larger prey such as small copepods. Diets of adult pollock consist mainly of copepods, euphausiids, and fish (a majority of fish eaten are juvenile pollock). Walleye pollock constitute a major part of the diets of northern fur seals and other marine mammals in the Bering Sea, and are important as prey to seabirds and other fish species.

9.1.2 Pacific cod. This species is generally common at depths of 80-260 m. In the Bering Sea, Pacific cod schools are most abundant on the shelf and upper slope. They undergo seasonal migrations between the continental slope and shelf, and along the continental slope. Spawning begins in January, but exact timing and areas of spawning are not known. Females produce from 200,000 to 5,700,000 eggs, which are benthic and initially slightly adhesive. The eggs hatch within 10-20 days and larvae are distributed at depths from 25-150 m, with the largest numbers at 75-100 m. Adults are mostly semi-demersal and feed on benthic epifauna, planktonic crustaceans, and fish. Pacific cod are utilized as food by northern fur seals, halibut, belugas, and sperm whales.

9.1.3 Yellowfin sole. The eastern Bering Sea contains the largest single population of this flatfish, which occurs on the shelf at depths from 5-360 m. Yellowfin sole undergo complex seasonal movements (both vertical and horizontal) which are not fully understood. During winter, adults congregate in large dense schools on the outer shelf and upper slope from 100-270 m. In spring, fish begin moving into shallower waters, and by summer the main body of the stock is found on the inner shelf at depths of less than 100 m where feeding and spawning takes place. In late autumn, the fish migrate back to deeper waters. Distribution and movements of yellowfin sole

are associated with environmental factors including temperature, salinity, and bottom sediment type. Adult yellowfin sole are not confined to the bottom, but make periodic vertical movements through the water column. Spawning takes place predominantly in June and July on the inner shelf with females releasing from 1,000,000 to 3,000,000 pelagic eggs, which accumulate in central areas of well-developed gyres. The larvae are pelagic for 4 to 5 months before undergoing metamorphosis; at lengths of about 17 mm the juvenile sole settle to the bottom along the inner shelf. As the juveniles grow they apparently move gradually into deeper water. Their principal prey include benthic infauna and epifauna, although they also eat euphausiids, copepods and fish. Important predators on yellowfin sole include Pacific halibut and northern fur seals.

9.1.4 Greenland turbot. Large concentrations of greenland turbot are found in the eastern Bering Sea and Navarin Basin in a depth range of about 70-670 m. Seasonal movements by greenland turbot are complex and not fully understood. They are generally found at shallower depths in the summer than in winter. Spawning occurs from October to December in waters greater than 100 m in depth; the eggs are apparently bathypelagic, developing in deep water. After hatching, the larvae are pelagic and found in the 30-130 m depth range until they reach a length of about 80 mm when they transform and become demersal. Little else is known about the life history. Greenland turbot feed on a variety of foods including pelagic, mid-water, and demersal fishes, crustaceans, and squids.

9.1.5 Other flatfishes. These include rock sole, flathead sole, arrowtooth flounder, rex sole, butter sole, longhead dab, Dover sole, starry flounder, Alaska plaice, and longnose plaice.

Rock sole are most abundant in the southeastern region of the Bering Sea where they occupy areas of the shelf down to 300 m. Seasonal movements are not well-known. Spawning takes place from March to June at depths near 100 m. Eggs are adhesive and demersal, sinking to the bottom; larvae are pelagic. Adults prey on benthic invertebrates, and occasionally on fish. Predators include fish and marine mammals.

Flathead sole are most abundant in the eastern portion of the Bering Sea. They range in depth from the surface to 550 m. Seasonal distributions consist of concentrations overwintering in depths of 70-400 m on the outer shelf which then migrate to shallower waters (20-180 m) in the spring. Reproduction takes place during February to May within the shelf boundaries; eggs and larvae are pelagic and become widely distributed. The adults prey primarily upon benthic crustaceans, fish, and squid. Predators on flathead sole are not well known, but are thought to be Pacific halibut and marine mammals.

Arrowtooth flounder are most abundant on the continental slope of the southeastern, central, and northwestern Bering Sea at depths of 200-500 m. Arrowtooth flounder move seasonally from the 300-500 m depth range in the winter to the 200-400 m depth range in the summer, apparently associated with water temperatures. Adults are thought to spawn from December to February, releasing up to 500,000 bathypelagic eggs. Hatched larvae remain in shallow nearshore waters over the shelf for several months; then they settle to the bottom. Juveniles gradually move into deeper waters as they grow. Major

foods include crustaceans and fish. Predators on arrowtooth flounder are thought to be Pacific halibut and marine mammals.

9.1.6 Pacific ocean perch. The species is common in and along canyons and depressions on the upper continental slope. The most dense concentrations occur from January to May, during spawning, west of the Pribilofs at depths of 340-420 m. During this period, the species undergoes daily vertical migrations, probably for feeding. Rockfishes give birth to live young. Because Pacific ocean perch inhabit such deep waters, tag and recapture studies are virtually impossible. Any statements about their migration patterns are therefore speculation.

Pacific ocean perch probably mate during winter (October - February) and young are born in spring (March - June). Larvae are 5 to 8 mm at birth and live a planktonic existence for an undetermined period of time. The juveniles (ages one to five) feed mainly on copepods and euphausiids; adults on euphasiids, copepods, fish, and squid.

9.1.7 Other rockfishes. These include rougheye rockfish, dusky rockfish, northern rockfish, shortspine thornyhead, shortraker rockfish, dark blotched rockfish, yelloweye rockfish, and blue rockfish. Rockfishes are mostly demersal and distributed from the surface to very deep waters. Little is known about the biology of Bering Sea rockfishes other than Pacific ocean perch.

9.1.8 Sablefish. This species occupies the water column from the surface to a depth of 1200 m and is most abundant between 100-1000 m on the outer continental shelf and continental slope, where 15 to 20 percent of the total species biomass is located. Some sablefish undertake migrations between different areas in the North Pacific; more localized cross-shelf migrations have also been observed. Sablefish make daily vertical movements associated with feeding; fish are found higher in the water column during the day and nearer the bottom at night. Sablefish spawn during winter (February) at depths of around 550 m, where females release up to 1,000,000 pelagic eggs which rise toward the surface as they develop and hatch. Later-stage larvae are found near the surface. Little is known of egg or larval development, although one-year-old juveniles appear annually in shallow coastal waters. As pelagic juveniles mature, they move into deeper waters and become demersal. Sablefish feed on a wide variety of prey, both pelagic and benthic, depending on location, season, and age of fish. The prey include squid, capelin, pollock; and euphausiids, shrimp, pleuronectid species, cottids, and benthic invertebrates. Predators on sablefish include Pacific halibut, ling cod, and sea lions.

9.1.9 Atka mackerel. This species occurs in the Bering Sea from the Aleutian Islands to Cape Navarin. It spawns near the bottom, but is generally encountered in the upper water layers. Atka mackerel spawn from June to September in coastal areas with stony or rocky bottoms. The eggs are demersal and are deposited in large masses on stones or in cracks among rocks. Hatched larvae are found at depths of 2-30 m and move to the surface at night. The larvae are widely dispersed for distances of up to 200-500 miles from shore. Adults feed largely on euphausiids. Predators on Atka mackerel are marine mammals and the larger pelagic fishes.

9.1.10 Squid. Several species of squid inhabit the Bering Sea seasonally, wide ranging in distribution. The exact nature and size of the resource are poorly defined, but they are generally thought to be large and mobile. Squid live at both mid-water and near surface depths. Spawning, for some species, may extend from spring to fall; sexual maturity may be reached in 2 years or less. Fertilization is internal; the fertilized eggs are released enmeshed in a gelatinous material. The number of eggs spawned per individual is low compared to groundfish. Predators on squid are marine mammals and pelagic fishes.

9.1.11 Pacific halibut. The distribution is widespread on the shelf and slope to depths of up to 700 m. They undertake seasonal migrations to shallow spring feeding areas, and to deeper waters (250-550 m) in the fall, where they spawn and remain in the winter. Seasonal movements can extend as far as 800 km. Spawning takes place from November through February, and females release up to 2,000,000 pelagic eggs. Larvae are also pelagic until reaching a length of about 10 cm after about 6 months; at that time they settle to the bottom to begin a benthic existence. During the pelagic life stage, eggs and larvae may be transported several hundred km by currents. Pacific halibut are long-lived and may reach ages in excess of 40 years. They are opportunistic feeders, consuming a variety of prey, which varies with age and area. Juvenile fish feed mainly on crustaceans, whereas older fish eat mostly other fish, particularly flounders. Predators of Pacific halibut are poorly known.

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[9.2 Stock Units. 9.3 Data Sources. 9.4 Quality of Data. 9.5 Ecological Relationships. 9.6 Current Status of Stocks. 9.7 Estimate of Future Stock Condition.]

9.8 Description of Habitat Types.

The Bering Sea covers a flat, relatively featureless shelf whose southern boundary extends from near Unimak Pass to Cape Navarin, and from a deepwater basin bounded by the shelf and the Aleutian Island Arc. The Bering Sea has certain characteristic features which make it different from other corresponding regions in higher latitudes (see Table 9.1 from Favorite and Laevastu, 1981). The Aleutian Island Arc contains a narrow shelf that drops off rapidly to the Bering Sea on the north and the North Pacific Ocean to the south. Seasonal changes are more moderate than over the Bering Sea shelf. Ocean currents flow through the passes between the Islands, and south of the chain the narrow shelf is washed by a westward current which is stronger in the eastern part; on the Bering Sea side this current is missing.

The waters of the Bering Sea can be partitioned (Kinder and Schumacher, 1981 a, b) during the summer by transition zones which separate four hydrographic domains (Figure 9.1). The hydrographic domains are distinguished by bottom depth and seasonal changes in their vertical density structure. During the winter the structure is absent or much less apparent under the ice. Beginning in the nearshore area, the coastal domain includes waters less than 50 m in depth that due to tidal mixing do not stratify seasonally. A zone of transition separates the coastal domain from the middle shelf domain. In the middle shelf domain, over bottom depths of 50 to

Table 9.1. CHARACTERISTIC FEATURES OF THE EASTERN BERING SEA SHELF ECOSYSTEM

Characteristic Features	Consequences
Physical Features	
Large continental shelf	High standing stocks of biota
	High fish production
	Large food resources for mammals
High latitude area	Nutrient replenishment with seasonal turnover
	Environmental distribution limits for many species
	Large seasonal changes
	Seasonal presence of ice
	Accumulation of generations
Large seasonal changes	Seasonally changing growth
	Seasonal migrations
	Possibility of large anomalies
Ice	Presence of ice-related mammals
	Migration of biota (in & out) caused by ice
	Limited production in winter
Cold bottom water	Outmigration of biota
	Higher mortalities & lower growth of benthic & demersal biota
	Accumulation of generations
High runoff	Low salinities (near coasts)
	High turbidities
	Presence of eurohaline fauna
Sluggish circulation	Local biological production
	Local pelagic spawning
Biological Features	
High production & slow turnover	High standing stocks
Fewer species (than in lower latitudes)	Few species quantitatively very dominant
High amounts of marine mammals & birds)	High predation by apex predators
Pronounced seasonal migrations	Great local space & time changes of abundance
Fisheries Resource Features	
Pollock dominate semidemersal species	Flexible feeding & breeding habits, especially environmental adaption
Yellowfin sole dominant demersal species	Abundant bethos food supply
Herring & capelin dominant pelagic species	Important forage species in the ecosystem
Abundant crab resources	Large, relatively shallow shelf
	Few predators on adults, especially environmental adaption
Abundant marine mammals	Abundant food supply, no enemies, insignificant hunting
	Competes with man on fishery resources
Man-related Features	
Fisheries development rather recent	Ecosystem in near-natural state, not yet fully adjusted to effects of extensive fishery
Little inhabited coasts	Ample space for breeding colonies for mammals & birds
	Very limited local fisheries, no pollution

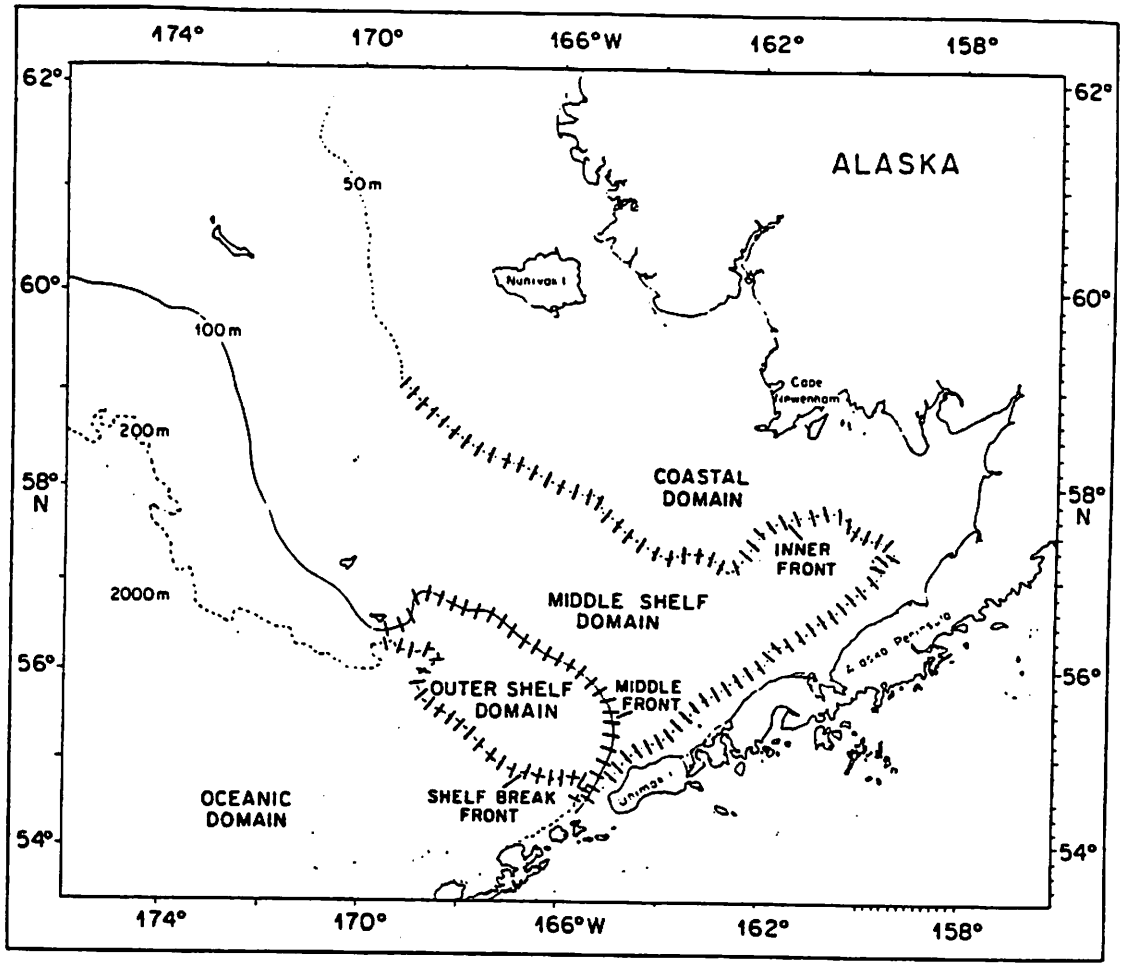

Figure 9.1. Hydrographic Domains And Transition Zones (Bars) During Summer In Bering Sea

100 m, seasonal stratification sets up during the ice-free season, and warmer, less saline waters overlie colder and more saline bottom waters. This stratification persists until broken down by winter cooling and storms. A broad transition zone separates the middle shelf zone from the outer shelf domain. This latter domain, in water depths from 100 to 170 m, is characterized by well-mixed upper and lower layers separated by a complex intermediate layer containing fine density structure. In general, the outer shelf waters intrude shoreward near the bottom, while middle shelf waters spread seaward above them. Beyond the outer shelf domain, the shelf break front separates the shelf waters from the oceanic domain, with its more saline, less aerobic waters overlying the Bering Sea slope and deep basin.

Net circulation in the Bering Sea is generally sluggish. However, moderate to strong tidal and wind-driven currents can be established over the shelf. Nearshore coastal currents from the Gulf of Alaska shelf flow into the Bering Sea through Unimak Pass and then apparently continue northeastward along the Alaska Peninsula. Within Bristol Bay, the flow becomes counterclockwise and follows the 50 m depth contour toward Nunivak Island. In the middle shelf domain (water depths from 50 - 100 m), currents are weak and variable, responding temporarily as wind-driven pulses. In the outer shelf domain, a mean northwestward flow exists along the shelf edge and upper slope following depth contours.

With respect to the physiographic regimes and hydrographic domains of the Bering Sea, many species perform seasonal and spawning migrations from one domain to another. Shelf dwellers, such as yellowfin sole and Pacific halibut spawn in deep water 275-410 m (Garrison and Miller, 1982), while walleye pollock form mid-water spawning shoals. Other species also make similar off-on shelf migrations for spawning and feeding. Adult sablefish and Pacific ocean perch live principally on the continental slope at water depths greater than 200 m but are known to make large daily vertical movements within the water column for feeding.

9.9. Habitat Areas of Particular Concern. With the possible exception of the ice-covered surface layer of the shelf during winter, there is not an area of the Bering Sea, water depth, or time of year when one or several species of commercial importance are not present at some life stage. It is difficult without better information to designate particular habitats that can be spatially and temporally defined as holding substantially more important resource values than other areas.

Adults of most of the commercially important groundfish species are known to form dense aggregations on feeding or spawning grounds at certain seasons. Most often these concentrations are found on or inside of the shelf edge in spring and early summer when and where suitable environmental conditions have formed. However, these areas shift in size and location from year to year, presumably due to a combination of environmental and population variables that are not yet well understood. For example, feeding pollock concentrations have been found to be primarily located in outer shelf waters in years when the bottom water of the middle shelf domain remained cold, but extended onto the middle shelf in warm years (Lynde, 1984).

Eggs and larvae of the groundfish species are usually more widely distributed spatially than the adults, but may be confined to a specific

range of water depths. Some species such as walleye pollock lay buoyant eggs that float to the sea surface; sablefish larvae move to the surface layer during development; other species such as Atka mackerel and rock sole lay demersal eggs that sink or adhere to the bottom.

In a general way, the following areas (among others) of the Bering Sea and Aleutians can be described as particularly rich in groundfish:

- The shelf edge from Unimak Pass northwest toward the Pribilof Islands contains abundant schools of walleye pollock and Pacific cod.

- The seabed of the middle shelf of outer Bristol Bay contains dense spawning and feeding aggregations of yellowfin sole.

- Submarine canyons along the continental slope of the Bering Sea and Aleutian Islands harbor dense concentrations of Pacific ocean perch and other rockfish species.

- Atka mackerel spawning occurs on certain restricted shelf areas with suitable (rocky) bottom characteristics, and may be particularly concentrated in the western Aleutians, such as the strait between Atka and Amlia Islands.

Significant increases in knowledge of the habitat requirements of the groundfish species are yet to be made. With this additional understanding, it may be possible to develop a finer definition of habitat areas of particular concern and a better ability to manage single and multispecies fishery resources.

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[10.0 Other Considerations Which May Affect the Fishery.
10.1 International Pacific Halibut Commission. 10.2 Marine Mammal Protection Act of 1972.]

10.3 Potential for Habitat Alteration. This section discusses types of human activities that have a potential to cause pollution and habitat degradation that could affect groundfish populations in the Bering Sea and Aleutian Islands area. It is not intended as a statement of present conditions; rather, it is designed to identify those areas of uncertainty that may reasonably deserve Council attention in the future. Whether the likelihood and level of these activities or events may cause harm to groundfish resources and their habitats can be better judged when the details of a proposed activity's location, magnitude, timing, and duration are more fully known.

Habitat alteration may lower both the quantity and quality of groundfish products through physical changes or chemical contamination of habitat. Species and individuals within species differ in their tolerance to effects of habitat alteration. It is possible for the timing of a major alteration event and the occurrence of a large concentration of living marine resources to coincide in a manner that may affect fishery stocks and their supporting habitats. The effects of such events may be masked by natural phenomena or may be delayed in becoming evident. However, the process of habitat degradation more characteristically begins with small-scale projects that

result in only minor losses or temporary disruptions to organisms and habitat. As the number and rate of occurrence of these and other major projects increases, their cumulative and synergistic effects become apparent over larger areas. It is often difficult to separate the effects of habitat alteration from other factors such as fishing mortality, predation, and natural environmental fluctuations.

Species dependent on coastal areas during various stages of their life, particularly for reproduction, are more vulnerable to habitat alterations than are species that remain offshore. Also, the effects of habitat alteration on fish species offshore are not as apparent as they are in coastal areas. Concern is warranted, however, to the degree that (1) the offshore environment is subject to habitat degradation from either inshore activities or offshore uses, and (2) to the extent that some species living offshore depend directly or indirectly on coastal habitats for reproduction and food supply.

At present, there are no indications that human activities in the Bering Sea/Aleutian Island area have had any measurable effect on the existing habitats of groundfish, though there have been localized effects. The present primary human use of the offshore area is commercial fishing. While the establishment of other activities could potentially generate user conflicts, pollution, and habitat deterioration, it is the collective opinion of the Council and NMFS that the status of the habitat in this management area is generally unaffected by other human activities at this time.

10.3.1 Offshore petroleum production. More information can be found in Berg (1977); Deis et al. (1983); OCSEAP Synthesis Reports on the St. George Basin (1982), the Navarin Basin (1984), and the North Aleutian Shelf (1984); Thorsteinson and Thorsteinson (1982); and the University of Aberdeen (1978).

The Alaska offshore area comprises 74 percent of the total area of the U.S. continental shelf. Because of its size, the Alaska outer continental shelf (OCS) is divided into three subregions--Arctic, Bering Sea, and Gulf of Alaska. The Bering Sea/Aleutian Subregion contains five planning areas where lease sales have been held or are currently scheduled - Norton Basin, St. George Basin, Navarin Basin, North Aleutian Basin, and Shumagin.

If a commercial quantity of petroleum is found in the Bering Sea, its production would require construction of facilities and all the necessary infrastructure for pipelines to onshore storage and shipment terminals or for building offshore loading facilities. It is believed that Bering Sea oil would be pipelined to shore and then loaded on tankers for transportation from Alaska. In the Navarin Basin, however, offshore-loading terminals may be more feasible. Unlike exploration, production would continue year-round and would have to surmount the problems imposed by winter sea-ice in many areas. Norton Basin and perhaps Navarin Basin would require ice-breaking tanker capabilities. There are also occasional proposals for tankering oil from Arctic fields via the Bering Sea, which would also require ice-breaking capabilities.

Oil and gas related activities in the Bering Sea and Aleutian Island area have the potential to cause pollution of habitats, loss of resources, and use conflicts. Physical alterations in the quality and quantity of

existing local habitats may occur because of the siting and construction of offshore drilling rigs and platforms, loading platforms, or pipelines.

Large oil spills are the most serious potential source of oil and gas development-related pollution in the eastern Bering Sea and Navarin Basin. Offshore oil and gas development will inevitably result in some oil entering the environment. Most spills are expected to be of small size, although there is a potential for large spills to occur. In large quantities, this oil can affect habitats and living marine resources. Many factors determine the degree of damage from a spill; the most important variables are the type of oil, size and duration of the spill, geographic location of the spill, and the season. Although oil is toxic to all marine organisms at high concentrations, certain species are more sensitive than others. In general, the early life stages (eggs and larvae) are most sensitive; juveniles are less sensitive, and adults least so (Rice et al., 1984).

Habitats most sensitive to oil pollution are typically located in those coastal areas with the lowest physical energy because once oiled, these areas are the slowest to repurify. Examples of low energy environments include tidal marshes, lagoons, and seafloor sediments. Exposed rocky shores and ocean surface waters are higher energy environments where physical processes will more rapidly remove or actively weather spilled oil.

It is possible for a major oil spill (i.e., 50,000 bbls) to produce a surface slick covering up to several hundred square kilometers of surface area. Oil would generally be at toxic levels to some organisms within this slick. Beneath and surrounding the surface slick, there would be some oil-contaminated waters. Mixing and current dispersal would act to reduce the oil concentrations with depth and distance. If the oil spill trajectory moves toward land, habitats and species could be affected by the loading of oil into contained areas of the nearshore environment. In the shallower waters, an oil spill could be mixed throughout the water column and contaminate the seabed sediments. Suspended sediment can also act to carry oil to the seabed.

Toxic fractions of oil mixed to depth and under the surface slick could cause mortalities and sublethal effects to individuals and populations. However, the area contaminated would appear negligible in relation to the overall size of the area inhabited by commercial groundfish in the Bering Sea. For example, Thorsteinson and Thorsteinson (1982) calculated that a 50,000 barrel spill in the St. George Basin would impact less than 0.002 percent of the total size of this area. As a result, oil spills at sea are believed to be local and transitory, and would have only minor effects on fish populations overall. Measurable damage to fishery stocks from an oilspill would appear to be the exception rather than the rule. Even if concentrations of oil are sufficiently diluted not to be physically damaging to marine organisms or their consumers, it still could be detected by them, and alter certain of their behavior patterns. If an oil spill reaches nearshore areas with productive nursery grounds or areas containing high densities of fish eggs and larvae, a year class of a commercially important species of fish or shellfish could possibly be reduced, and any fishery dependent on it may be affected in later years. An oil spill at an especially important habitat (e.g., a gyre where larvae are concentrated)

could also result in disproportionately high losses of the resource compared to other areas.

Other sources of potential habitat degradation and pollution from oil and gas activities include the disposal of drilling muds and cuttings to the water and seabed, disposal of drilling fluids and produced waters in the water column, and dredged materials from pipeline laying or facilities construction. These materials might contain heavy metals or other chemical compounds that would be released to the environment, but the quantities are generally low and only local impacts would be expected to occur. Again, these activities may be of concern if they occurred in habitats of special biological importance to a resource.

10.3.2 Coastal development and filling. Minimal developmental pressure has occurred in the coastal habitat of the Bering Sea and Aleutian area. An extension of the airport runway at the village of Unalaska into water approximately 50-feet in depth has received the necessary permits but has not yet been constructed. Construction of a large-scale port facility is planned for the city of Nome and a smaller-scale harbor is currently under construction on St. Paul Island. Beyond these specific projects, development activity in the coastal areas of the Bering Sea and the Aleutian Islands has been largely limited to construction of erosion control measures and breakwaters (e.g., the city of Bethel). Because of the desirability of finding protection from Bering Sea storms, suitable port development sites often are valuable to fishery resources for similar related reasons. Without special considerations these facilities could affect local flushing, water temperatures, water quality, and access by fishes. In other areas, shallow water depth requires construction of long structures projected seaward in order to provide direct access from the uplands to deeper-draft ocean going vessels. These causeways could alter both along-shore physical processes and the migration and movement of fish in the area.

10.3.3 Marine mining. At present, mining activity has been limited to extraction of gravel and gold in the Bering Sea and the Aleutian peninsula. Gravel is needed for almost all construction projects throughout the area and is relatively unavailable from upland sources. Consequently, gravel is obtained by mining gravel beaches along the Bristol Bay coast (e.g., Goodnews Bay, Kangirlvar Bay) and in the lower reaches of the Yukon and Kuskokwim Rivers. Mining of large quantities of beach gravel can significantly affect the removal, transport, and deposition of sand and gravel along shore, both at the mining site and at other more distant areas. During mining, water turbidity increases and the resuspension of organic materials could affect less motile organisms (i.e., eggs and recently hatched fishes), and displace the more motile species from the area. Spawning and rearing habitats could be damaged or destroyed by these actions. Neither the future extent of this activity nor the effects of such mortality on the abundance of marine species is known.

Dredging for gold has been attempted at various sites along the Aleutians and there are several current proposals for the offshore mining of gold near the city of Nome. One such proposal, which has received all of the necessary permits to proceed, will entail dredging 21,000 acres of sea bottom in Norton Sound for the purpose of recovering gold. Such activity has the

potential to cause physical damage directly and indirectly to benthic habitat and to fish during certain juvenile life stages.

10.3.4 Ocean discharge and dumping. At present, there are only two areas in the Bering Sea/Aleutian Islands area where the ocean discharge of materials is known to occur on a large scale. Both of the areas are dredged material disposal sites near the city of Nome and have been in use for approximately 50 years. Recently, the two areas were given final designation as ocean dredged material disposal sites by the Environmental Protection Agency. Use of these sites presents no new habitat concerns.

The return of materials dredged from the ocean to the water column is considered a discharge activity. Depending upon the chemical constituency of the local bottom sediments and any alterations of dredged materials prior to discharge, living marine resources in the area may be exposed to elevated levels of heavy metals. For example, natural deposits of mercury occur in eastern Norton Sound and elemental mercury, measured as reaching levels ranging from 250-1300 ug/l, has been identified in marine sediments in that area (Nelson et al., 1975). The levels of this heavy metal exceed the 3.7 ug/l set by the EPA Marine Quality Standards as the maximum allowable concentration; although no measurements of the more toxic methyl and dimethyl forms of mercury have been made in this area, Wood (1974) demonstrated that mercury available to the aquatic environment in any form can result in steady state concentrations of methyl, dimethyl, and metallic mercury through microbial catalysis and chemical equilibrium. Large-scale gold dredging projects proposed in eastern Norton Sound would result in the discharge and resuspension of sediments that could introduce mercury to the water column.

Accumulation of heavy metals in fish is usually natural, but also may be an indication of habitat deterioration. The Federal Drug Administration's (FDA) safety limit for mercury is presently 1.0 ppm of methyl mercury or about 1.1 ppm of mercury. In Hall, et al (1976) a sample of sablefish caught in the Bering Sea and in the vicinity of Kodiak Island contained levels of mercury (0.02 - 0.11, $\bar{x}$ 0.04 ppm)--well below the FDA limit. Levels found in the natural environment or the fish pose no problem at present.

10.3.5 Derelict fragments of fishing gear and general litter. The introduction of debris into the marine environment occurs when commercial fisheries take place. The debris includes netting, pots, longline gear, packing bands, and other material. Because of the lack of a monitoring program, estimates of debris have been based on 1) observations of debris at sea and on beaches, and 2) occasional reports of accidental or deliberate discards of fishing gear. Studies by Merrell (1984) and others have shown that much of the observed debris consists of fragments of trawl netting. Much of this netting may be discarded carelessly at the time nets are repaired.

The quantity of marine debris that is produced by commercial fisheries depends on a variety of factors including the types and amount of gear used and the efforts fishermen make to reduce both accidental and deliberate discards. It is not known how the type and amount of gear used will change or how such change will affect the level of debris.

Debris may result in the mortality of marine fish, marine mammals, and birds that become entangled in or ingest it. Discarded trawl netting that floats at the surface is not a threat to most fish, but it has been identified as a source of mortality for marine mammals and birds. Similarly, discarded packing bands have been identified as a source of mortality for marine mammals. Other discarded gear including pots continue to function unattended for varying lengths of time. Neither the extent of debris related mortality nor the effects of such mortality on the abundance of various species is known.

10.3.6 Benthic habitat damage by bottom gear. Bottom trawls are presently the predominant gear used for groundfish in the Bering Sea/Aleutian Island management area, and are likely to continue as the major gear for the flatfish and Pacific cod fisheries of the Bering Sea shelf. The generally flat and uniform bottom composed of sand and mud presents a good substrate for bottom trawling.

Any effect of gear dragged along the bottom depends on the type of gear, its rigging, and the type of bottom and its biota. In addition to the target species, movement of a bottom trawl through an area primarily affects the slow moving macrobenthic fauna such as seastars and sea urchins. Some bivalves can also be damaged. It is possible for demersal eggs such as rock sole and Pacific cod to be disturbed by the passage of trawls. Although little is known of the effects these disturbances and damages have on the affected species or their local communities, only minor impacts are suspected.

Numerous studies to determine these impacts have been conducted (notably in European waters) since World War II. Most of the studies and their results have been summarized in a report by Natural Resource Consultants (1984) titled "Trawl Evaluation Study". The consensus of these investigators is that the overall effect of trawling on sea bottom may not be harmful, and may in fact be beneficial. They found, for example: that trawl doors on sand and soft bottom stir up sand and silt which settle quickly. On muddy bottoms, the stirred up mud settles in a few hours, depending on the current speed and resulting turbulence near the bottom. Trawls have not been observed to kill flatfishes. The damaged organisms, as well as the infauna which might have been dug up by the trawl are quickly preyed upon by fish and crabs. Similar findings originate from a study of hydraulic clam dredges in the southeastern Bering Sea, where yellowfin sole quickly concentrated in the dredge wake feeding on exposed organisms. Several researchers observe that fishing by trawls with tickler chains has not resulted in any apparent effects on the sea bed or its biota (Hempel, 1979).

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14.0 Management Regime.

14.1 Management Objectives.

[Add:] E. Seek to maintain the productive capacity of the habitat required to support the Bering Sea/Aleutian Island groundfish fishery.

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[14.2 Area, Fisheries, and Stocks Involved. 14.3 Fishing Year. 14.4 Management Measures--Domestic Fishery. 14.5 Management Measures--Foreign Fisheries. 14.6 Operational Needs and Costs.]

14.7 Management Measures to Address Identified Habitat Problems. An FMP may contain only those conservation and management measures which pertain to fishing or to fishing vessels. The Secretary, upon the recommendation of the Council, may adopt regulations of the kinds and for the purposes set forth below.

- Propose regulations establishing gear, timing, or area restrictions for purposes of protecting particular habitats of species in the Bering Sea/Aleutian Island groundfish fishery.

- Propose regulations establishing area or timing restrictions to prevent the harvest of fish in contaminated areas.

- Propose regulations restricting disposal of fishing gear by domestic vessels.

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16.0 Research Needs. [Add, as follows:]

[as first paragraph to existing section:] In deciding which of these research needs are to be addressed, it is important that they be reviewed regularly and ranked in order of importance and likelihood of success.

[to end of original first paragraph:] and (6) examine the direct affects of man's activities on fish habitats and ecosystems.

[before penultimate paragraph:] Research needs related to maintaining the productive capacity of fish habitat can be broadly classified as those which (a) examine the direct affects of man's activities (such as fishing, oil exploration, or coastal development), and (b) apply fisheries oceanography in an ecosystem context (such as migration and transport patterns, predator/prey relationships, life histories). Both categories of research serve to increase the understanding of natural systems and the ability to detect and measure change caused by natural or man-made forces. The following represents areas that are potential cause for concern, and where precaution is warranted.

Under category (a), further research should be conducted on the short and long-term effects of habitat alteration caused by fishing and oil exploration in the Bering Sea/Aleutian Island groundfish management area. These include the effects of derelict fishing gear, pollution products, the recovery rate of oil-polluted environments, and long-term cumulative effects of discharged and spilled oil.

Under category (b), expanded research is needed on factors affecting the ecosystem such as currents, temperatures, ocean productivity and food chains, and the influence of climatic variation on biological and physical events. More information about life histories, habitat requirements, and predator/prey relationships is needed for a clearer understanding of an organism's response to perturbations in the habitat.

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18.1 General.

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19.0 Appendices.

Appendix IV--Programs Addressing Habitat of Bering Sea/Aleutian Island Groundfish Stocks.

A. Habitat protection: existing programs.

This section describes (a) general legislative programs, portions of which are particularly directed or related to the protection, maintenance, or restoration of the habitat of living marine resources; and (b) specific actions taken by the Council and NMFS within the Bering Sea/Aleutian Island area for the same purpose.

1. Federal legislative programs and responsibilities related to habitat. The Department of Commerce, through NOAA, is responsible for, or involved in, protecting living marine resources and their habitats under a number of Congressional authorities that call for varying degrees of interagency participation, consultation, or review. Those having direct effect on Council responsibilities are identified with an asterisk. A potential for further Council participation exists wherever Federal review is required or encouraged. In some cases, State agencies may share the Federal responsibility.

* (a) Magnuson Fishery Conservation and Management Act (Magnuson Act). This Act provides for the conservation and management of U.S. fishery resources within the 200-mile fishery conservation zone, and is the primary authority for Council action. Conservation and management is defined as referring to "all of the rules, regulations, conditions, methods, and other measures which are required to rebuild, restore, or maintain, and which are useful in rebuilding, restoring, or maintaining, any fishery resource and the marine environment, and which are designed to assure that...irreversible or long-term adverse effects on fishery resources and the marine environment are avoided." Fishery resource is defined to include habitat of fish. The North Pacific Council is charged with developing FMPs, FMP amendments, and regulations for the fisheries needing conservation and management within its geographical area of authority. FMPs are developed in consideration of habitat-related problems and other factors relating to resource productivity. After approval of FMPs or FMP amendments, NMFS is charged with their implementation.

(b) Fish and Wildlife Coordination Act of 1958 (FWCA). The FWCA provides the primary expression of Federal policy for fish and wildlife habitat. It requires interagency consultation to assure that fish and wildlife are given equal consideration when a Federal or Federally-authorized project is proposed which controls, modifies, or develops the Nation's waters. For example, NMFS is a consulting resource agency in processing Department of the Army permits for dredge and fill and construction projects in navigable waters, Environmental Protection Agency (EPA) ocean dumping permits, Federal Energy Regulatory Commission hydroelectric power project proposals, and Department of the Interior (DOI) Outer Continental Shelf (OCS) mineral leasing activities, among others.

* (c) National Environmental Policy Act of 1969 (NEPA). NEPA requires that the effects of Federal activities on the environment be assessed. Its

purpose is to insure that Federal officials weigh and give appropriate consideration to environmental values in policy formulation, decisionmaking and administrative actions, and that the public is provided adequate opportunity to review and comment on the major Federal actions. NEPA requires preparation of an Environmental Impact Statement (EIS) for major Federal actions that significantly affect the quality of the human environment, and consultation with the agencies having legal jurisdiction or expertise for the affected resources. NMFS reviews EISs and provides recommendations to mitigate any expected impacts to living marine resources and habitats. An EIS or environmental assessment for a finding of no significant impact is prepared for FMPs and their amendments.

(d) Clean Water Act (CWA). The purpose of the CWA, which amends the Federal Water Pollution Control Act, is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters; to eliminate the discharge of pollutants into navigable waters; and to prohibit the discharge of toxic pollutants in toxic amounts. Discharge of oil or hazardous substances into or upon navigable waters, contiguous zone and ocean is prohibited. NMFS reviews and comments on Section 404 permits for deposition of fill or dredged materials into U.S. waters, and on EPA National Pollutant Discharge Elimination System permits for point source discharges.

(e) River and Harbor Act of 1899. Section 10 of this Act prohibits the unauthorized obstruction or alteration of any navigable water of the United States, the excavation from or deposition of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such water. Authority was later extended to artificial islands and fixed structures located on the Outer Continental Shelf. The Act authorizes the Department of the Army to regulate all construction and dredge and fill activities in navigable waters to mean high water shoreline. NMFS reviews and comments on Public Notices the Corps of Engineers circulates for proposed projects.

* (f) Endangered Species Act of 1973 (ESA). The ESA provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by DOI (terrestrial, freshwater, and some marine species such as walrus) and DOC (marine fish, and some marine mammals including the great whales). Federal actions that may affect an endangered or threatened species are resolved by a consultation process between the project agency and DOC or DOI, as appropriate. For actions related to FMPs, NMFS provides biological assessments and Section 7 consultations if the Federal action may affect endangered or threatened species or cause destruction or adverse modification of any designated critical habitat.

* (g) Coastal Zone Management Act of 1972 (CZMA). The principal objective of the CZMA is to encourage and assist States in developing coastal zone management programs, to coordinate State activities, and to safeguard the regional and national interests in the coastal zone. Section 307(c) requires that any Federal activity directly affecting the coastal zone of a State be consistent with that State's approved coastal zone management program to the maximum extent practicable. Under present policy, FMPs undergo consistency review. Alaska's coastal zone program contains a section on Resources and Habitats. Following a January 1984 U.S. Supreme Court ruling, the sale of

OCS oil and gas leases no longer requires a consistency review; such a review is triggered at the exploratory drilling stage.

* (h) Marine Protection, Research and Sanctuaries Act (MPRSA). Title I of the MPRSA establishes a system to regulate dumping of all types of materials into ocean waters and to prevent or strictly limit the dumping into ocean waters of any material which would adversely affect "human health, welfare or amenities or the marine environment, ecological systems, or economic potentialities." NMFS may provide comments to EPA on proposed sites of ocean dumping if the marine environment or ecological systems may be adversely affected. Title III of the MPRSA authorizes the Secretary of Commerce (NOAA) to designate as marine sanctuaries areas of the marine environment that have been identified as having special national significance due to their resource or human-use values. The Marine Sanctuaries Amendments of 1984 amend this Title to include, as consultative agencies in determining whether the proposal meets the sanctuary designation standards, the Councils affected by the proposed designation. The Amendments also provide the Council affected with the opportunity to prepare draft regulations, consistent with the Magnuson Act national standards, for fishing within the FCZ as it may deem necessary to implement a proposed designation.

(i) Outer Continental Shelf Lands Act of 1953, as amended (OCSLA). The OCSLA authorizes the Department of Interior's Minerals Management Service (MMS) to lease lands seaward of state marine boundaries, design and oversee environmental studies, prepare environmental impact statements, enforce special lease stipulations, and issue pipeline rights-of-way. It specifies that no exploratory drilling permit can be issued unless MMS determines that "such exploration will not be unduly harmful to aquatic life in the area, result in pollution, create hazardous or unsafe conditions, unreasonably interfere with other uses of the area, or disturb any site, structure or object of historical or archaeological significance." Drilling and production discharges related to OCS exploration and development are subject to EPA NPDES permit regulations under the CWA. Sharing responsibility for the protection of fish and wildlife resources and their habitats, NOAA/NMFS, FWS, EPA and the States act in an advisory capacity in the formulation of OCS leasing stipulations that MMS develops for conditions or resources that are believed to warrant special regulation or protection. Some of these stipulations address protection of biological resources and their habitats. Interagency Regional Biological Task Forces and Technical Working Groups have been established by MMS to offer advice on various aspects of leasing, transport, and environmental studies. NMFS is represented on both groups in Alaska.

The Secretary of the Interior is required to maintain an oil and gas leasing program that "consists of a schedule of proposed lease sales indicating, as precisely as possible, the size, timing, and location of leasing activity" that will best meet national energy needs for a 5-year period following its approval or reapproval. In developing the schedule of proposed lease sales, the Secretary is required to take into account the potential impacts of oil and gas exploration on other offshore resources, including the marine, coastal, and human environments.

Once a lease is awarded, before exploratory drilling can begin in any location, the lessee must submit an exploration plan to the Minerals

Management Service for approval. An oilspill contingency plan must be contained within the exploration plan. If approved by MMS and having obtained other necessary permits, the lessee may conduct exploratory drilling and testing in keeping with lease sale stipulations and MMS Operating Orders. If discoveries are made, before development and production can begin in a frontier lease area, a development plan must be submitted and a second EIS process begun. At this time, a better understanding of the location, magnitude, and nature of activity can be expected, and resource concerns may once again be addressed before development can be permitted to proceed.

* (j) National Fishing Enhancement Act of 1984. Title II of this Act authorizes the Secretary of Commerce (NOAA) to develop and publish a National Artificial Reef Plan in consultation with specified public agencies, including the Councils, for the purpose of enhancing fishery resources. Permits for the siting, construction, and monitoring of such reefs are to be issued by the Department of the Army under Section 10 of the River and Harbor Act, Section 404 of the Clean Water Act, or Section 4(e) of the Outer Continental Shelf Lands Act, in consultation with appropriate Federal agencies, States, local governments and other interested parties. NMFS will be included in this consultation process.

(k) Northwest Power Act of 1980 (NPA). The NPA includes extensive and unprecedented fish and wildlife provisions designed to assure equitable treatment of fish and wildlife, particularly anadromous fish, in making decisions about hydroelectric projects. Under the NPA, a detailed Fish and Wildlife Program has been established to protect, mitigate, and enhance fish and wildlife in the Columbia River Basin. In addition, general fish and wildlife criteria for hydroelectric development throughout the region have been established in the Regional Energy Plan developed under the Act. NMFS has a statutory role in the development of the Program and the Plan and encourages their implementation by Federal agencies such as the Federal Energy Regulatory Commmission, the Corps of Engineers, the Bureau of Reclamation, and the Bonneville Power Administration.

(l) Alaska National Interest Lands Conservation Act of 1980 (ANILCA). The purpose of this Act is to provide for the designation and conservation of certain public lands in Alaska. The Department of Agriculture Forest Service has authority to manage surface resources on National Forest Lands in Alaska. Under Title V of this Act, any regulations for this purpose must take into consideration existing laws and regulations to maintain the habitats, to the maximum extent feasible, of anadromous fish and other foodfish, and to maintain the present and continued productivity of such habitat when they are affected by mining activities. For example, mining operations in the vicinity of the Quartz Hill area in the Tongass National Forest must be conducted in accordance with an approved operations plan developed in consultation with NMFS; consultation continues through the monitoring and altering of operations through an annual review of the operations plan. Title XII of the Act establishes an Alaska Land Use Council to advise Federal agencies, the State, local governments and Native Corporations with respect to land and resource uses in Alaska. NOAA is named as a member of this Council.

* (m) Marine Mammal Protection Act (MMPA). The Marine Mammal Protection Act establishes a moratorium on the taking of marine mammals and a ban on the importation of marine mammal products with certain exceptions.

Responsibility is divided between DOC (whales, porpoises, seals, and sea lions) and DOI (other marine mammals) to issue permits and to waive the moratorium for specified purposes, including incidental takings during commercial fishing operations. The Magnuson Act amended the MMPA to extend its jurisdiction to the FCZ. If the FMP has effect on marine mammal populations, certain information must be included in the EIS, and the FMP should indicate whether permits are available for any incidental takings.

2. Specific actions taken by the Council and NMFS related to habitat for the for the Bering Sea/Aleutian Islands Groundfish fishery.

(a) Gear limitations that act to protect habitat or critical life stages. Section 611.16 of the foreign fishing regulations prohibit discard of fishing gear and other debris by foreign fishing vessels.

(b) Other management measures that act to allow for contingencies in the condition of the stock. Sections 675.20(a)(3) and 611.93 of the Bering Sea/Aleutian Islands Groundfish regulations establish a Reserve at 15 percent of the TAC; on specified dates, that portion of this reserve which the NMFS Regional Director finds will be harvested by U.S. vessels during the remainder of the year will be allocated to DAH, with the rest allocated to TALFF. However, the Regional Director is also permitted to withhold reserves for conservation purposes.

(c) Recommendations to permitting agencies regarding lease sales. Recommendations have been made to permitting agencies on all past proposed lease sales on the Alaska OCS, in the interests of protecting or maintaining the marine environment. These recommendations have ranged from calling for delay or postponement of certain scheduled sales such as in Bristol Bay and Kodiak, requesting deletions of certain areas from sales, identifying need for additional environmental studies and for protective measures such as burial of pipelines, seasonal drilling limitations, and oilspill countermeasure planning. For example, in 1979, the Council unanimously requested an indefinite postponement of the St. George Basin lease sale, citing incomplete research results and a concern for the possibility of oil spills in an area of great economic and biologic importance. The comment was transmitted to the NMFS Central Office for transmittal to the Department of the Interior.

B. Non-regulatory techniques to address identified habitat problems.

The following is a list of "real time" possible non-regulatory actions or strategies the Council may wish to take in the future, based on concerns expressed and data presented or referenced in this FMP. Actions taken must also be consistent with the goals and objectives of the FMP. Authorities for Council participation are described in Appendix IV-A, above. Possible regulatory actions may be found in section 14.7.

- Hold hearings to gather information or opinions about specific proposed projects having a potentially adverse affect on habitats of species in the Bering Sea/ Aleutian Island groundfish fishery.

- Write comments to regulatory agencies during project review periods to express concerns or make recommendations about issuance or denial of particular permits.

- Respond to "Calls for Information" from MMS regarding upcoming oil and gas lease areas affecting the Bering Sea/Aleutian Islands.

- Identify research needs and recommend funding for studies related to habitat issues of new or continuing concern and for which the data base is limited.

- Establish review panels or an ad hoc task force to coordinate or screen habitat issues.

- Propose to other regulatory agencies additional restrictions on industries operating in the fisheries management area, for purposes of protecting the habitat against loss or degradation.

- Join as amicus in litigation brought in furtherance of critical habitat conservation, consistent with FMP goals and objectives.