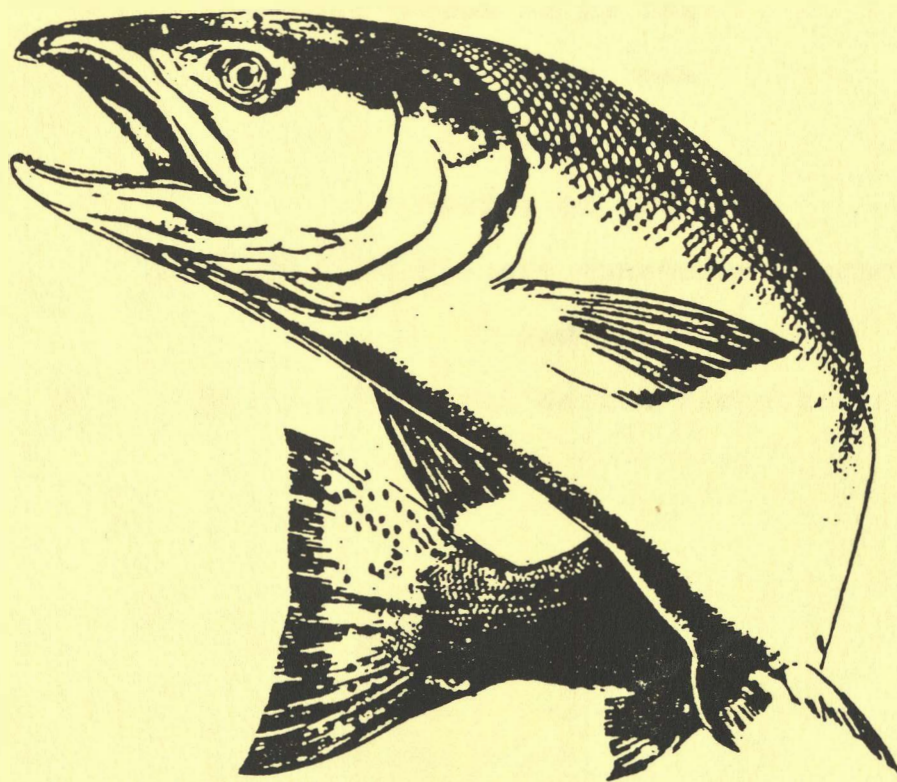


FISHERY MANAGEMENT PLAN
For The
SALMON FISHERIES
In The
EEZ Off The Coast Of ALASKA



APRIL 1990

NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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Prepared by the
Salmon Plan Team
and the
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North Pacific Fishery Management Council
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April 1990



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SUMMARY

This document describes the plan of the North Pacific Fishery Management Council (Council) for managing the salmon fisheries in the U.S. Exclusive Economic Zone (EEZ or Federal waters) off the coast of Alaska. It replaces the Council's existing plan, developed during 1977 and 1978 and amended in 1980 and 1981.

The original plan established the Council's authority over the salmon fisheries in the EEZ, the waters from 3 to 200 miles offshore, then known as the U.S. Fishery Conservation Zone (FCZ). The Council excluded from its coverage the Federal waters west of 175° east longitude (near Attu Island) because the salmon fisheries in that area were under the jurisdiction of the International Convention for the High Seas Fisheries of the North Pacific Ocean. The Council divided the FCZ covered by the plan into a West Area and an East Area with the boundary at Cape Suckling. It allowed recreational salmon fishing in both areas, prohibited commercial salmon fishing (with minor exceptions, see §2.2) in the West Area, and allowed commercial troll fishing in the East Area. Management measures for the salmon fisheries in the FCZ were equivalent to State regulations for the salmon fisheries in the adjacent State waters.

With time, the original plan became outdated and some of Alaska's management measures changed. Thus, the Council decided to amend the plan, to update it, correct minor errors, and remove itself from routine management of the salmon fisheries. Also, an amendment of the Magnuson Act required that any plan amendment submitted after 1 January 1987 to consider fish habitat and accommodate vessel safety. Finally, the Pacific Salmon Treaty imposed restrictions on Alaskan salmon fisheries that the Council needed to account for. This revised plan makes those changes in a reorganized and shortened document having a more appropriate title.

In producing this revised plan, the Council has reaffirmed its decision that existing and future salmon fisheries provide a situation demanding the Federal participation and oversight contemplated by the Magnuson Act. The plan retains the ban on salmon fishing with nets in both areas, retains the ban on commercial salmon fishing in the West Area, allows commercial hand-troll and power-troll salmon fishing in the East Area, allows sport fishing in both areas, and defers regulation of the sport and commercial fisheries in the EEZ to the State of Alaska.

An environmental assessment shows that the revised plan, by itself, will have no significant impact on the human environment, as defined by the National Environmental Policy Act. A regulatory impact review shows that implementing the revised plan would not be a major rule under Executive Order 12291 nor will it, by itself, have a significant economic impact on a substantial number of small entities, as defined by the Regulatory Flexibility Act.

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1.0 INTRODUCTION

This document describes the plan of the North Pacific Fishery Management Council (Council) for managing the salmon fisheries in the U.S. Exclusive Economic Zone (EEZ) off the coast of Alaska. It replaces the Council's existing plan, developed during 1977 and 1978 and amended in 1980 and 1981 (see Appendix A for a brief history of the salmon plan and Appendix B for the original objectives and the objectives as amended in 1981).

The Magnuson Fishery Conservation and Management Act (Magnuson Act, 16 U.S.C. 1801 et seq.) gives the Council responsibility for preparing and amending fishery management plans for any fishery in the Federal waters (EEZ) off the coast of Alaska that "requires conservation and management" (Section 302(h)(i)).

On 1 December 1978, the Council adopted its original plan for managing the high-seas salmon fisheries and submitted it to the Secretary of Commerce for approval and implementation with Federal regulations. The Council had determined that unless it managed the salmon fisheries in the waters under its jurisdiction certain salmon stocks would likely be overharvested. The Secretary approved the plan on 3 May 1979, and it was implemented for the first time on 18 May 1979 with emergency regulations (44 FR 29080). The Council has amended the plan twice, once in 1980 and once in 1981. This revised plan constitutes the third amendment.

The original plan established the Council's authority over the salmon fisheries in the Federal waters off the coast of Alaska, from 3 to 200 miles offshore, then known as the U.S. Fishery Conservation Zone (Figure 1). The Council excluded from its coverage the Federal waters west of 175° east longitude (near Attu Island) because the salmon fisheries in that area were under the jurisdiction of the International Convention for the High Seas Fisheries of the North Pacific Ocean (16 U.S.C. 1021 et seq.).

The Council divided the Federal waters off Alaska into two areas (an East Area and a West Area) at the longitude of Cape Suckling (143°53'36" W), established values for the maximum sustainable yield (MSY), allowable biological catch (ABC), and optimum yield (OY), and set the total allowable level of foreign fishing (TALFF) equal to zero for both areas. It closed the West Area (with three minor exceptions for traditional coastal net fisheries, see Appendix C) to all commercial salmon fishing; allowed commercial troll fishing for salmon in the East Area; and allowed sport (or recreational) salmon fishing in both areas.

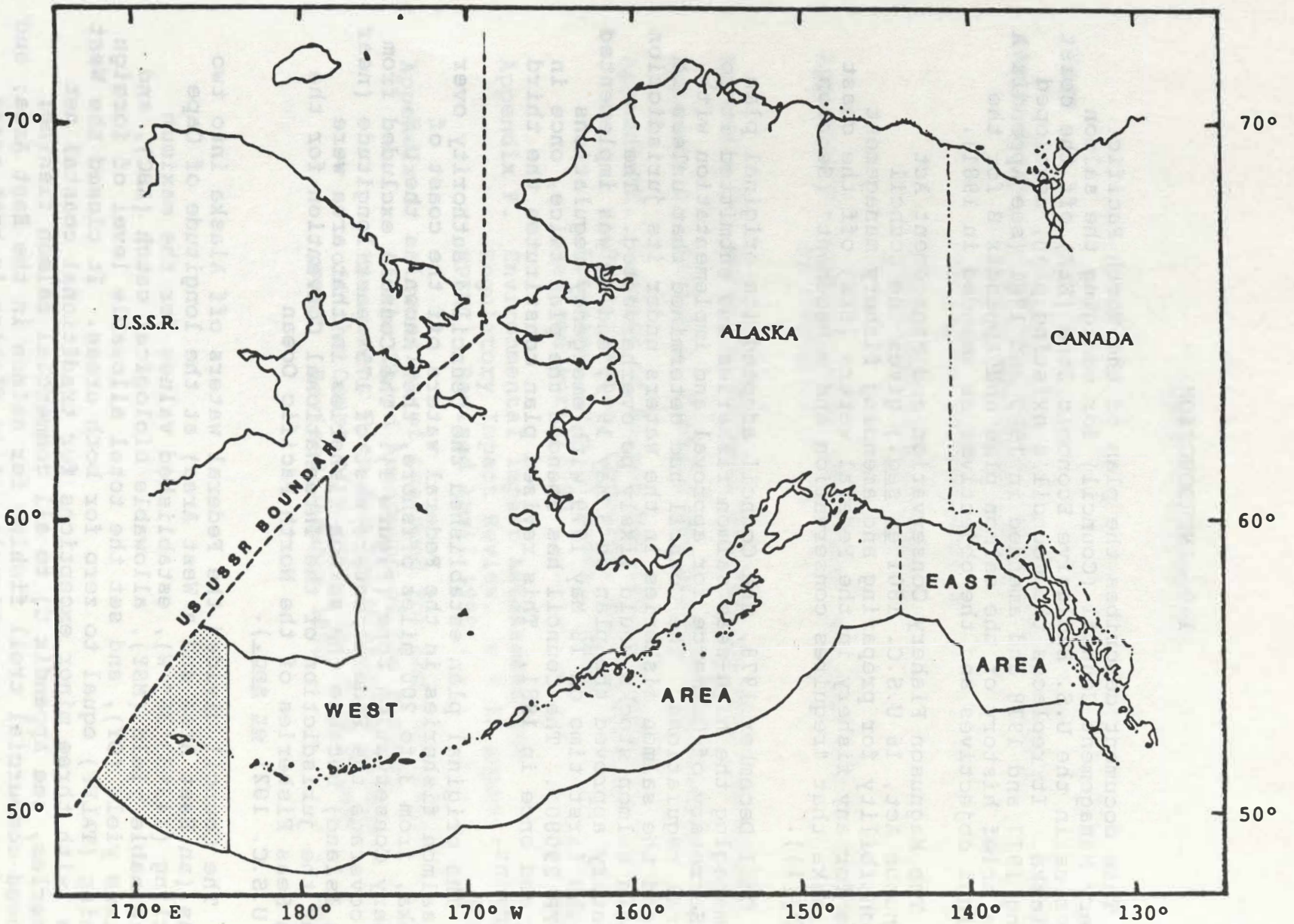


Figure 1. Map showing the East and West Salmon Management Areas in the U.S. Exclusive Economic Zone (EEZ) off the Coast of Alaska. The shaded area [] is the EEZ west of 175° East Longitude.

The plan focused primarily on the troll fishery in the east area. It established a general trolling season from 15 April through 31 October, restricted trolling gear, placed a moratorium on the size of the troll fleet, required trollers to have either a State of Alaska or a Federal limited-entry troll permit, set a 28-inch minimum length for chinook salmon, required fishermen to report their harvests, and provided for inseason adjustment of fishing times and areas. The Council intended to prohibit hand trolling in the Federal waters (to be consistent with the existing State ban on hand trolling in waters seaward of the surfline), but the Secretary of Commerce disapproved that provision. The Council allowed the sport fishery to be open all year, but restricted sport gear and harvest by adopting current State of Alaska regulations. The Council intended all of its management measures for the sport fishery and the commercial troll fishery to be complementary with State of Alaska regulations for the salmon fisheries in adjacent State waters.

With this document, the Council has now amended the plan three times. The first amendment extended the plan until 14 April 1981, continued the troll moratorium, provided for a 10-day closure to protect coho salmon, further restricted troll gear, and made a few other minor changes. The Council again attempted to prohibit hand trolling, but the Secretary disapproved that prohibition. The second amendment modified the objectives of the plan, reduced the ABC and OY for chinook salmon in the East Area by 15 percent, established a harvest range of 243,000 to 272,000 chinook with the upper limit as a harvest ceiling, and decreased the general trolling season to 15 May through 20 September. The Council proposed to modify its reporting requirements for fishermen landing their catch outside of Alaska, but, even though the Secretary approved this provision, it was disapproved by the Office of Management and Budget using its authority under the Paperwork Reduction Act.

In June 1986, the Council decided to amend its plan for a third time to (a) update it so the plan contained the best available scientific information, (b) correct minor errors, (c) increase management flexibility, and (d) make the plan consistent with the 1985 Pacific Salmon Treaty between the United States and Canada and the Pacific Salmon Treaty Act (16 U.S.C. 3631 et seq.).

In addition, because it was amending the plan for those other purposes, the Council needed to (a) consider temporary adjustments because of weather or other ocean conditions affecting the safety of vessels, and (b) contain a section on habitat, and (c) change the name of the U. S. Fishery Conservation Zone (FCZ) to the U. S. Exclusive Economic Zone (EEZ) as required by the 1986 amendments of the Magnuson Act.

In June 1988, the Council reviewed a draft of the revised salmon plan and requested its salmon plan team to revise the draft to extend jurisdiction of the plan over waters west of 175° east longitude, revise the definitions of MSY and OY, and defer regulation of the salmon fisheries to the State of Alaska. This revised plan (the third amendment) makes all those changes.

In adopting the third amendment, the Council reaffirmed its decision that existing and future salmon fisheries create a situation demanding the Federal participation and oversight contemplated by the Magnuson Act. It intends to maintain a plan for managing the salmon fisheries.

2.0 DESCRIPTION OF THE FISHERY MANAGEMENT UNIT

2.1 Areas

The Fishery Management Unit consists of all of the EEZ off the coast of Alaska and the salmon and fisheries that occur there.

The area covered by this fishery management plan is the EEZ off the coast of Alaska (See Figure 1), including parts of the Gulf of Alaska, Bering Sea, Chukchi Sea, and Arctic Ocean. Two management areas are established within the fishery management unit, with the border between the two at the longitude of Cape Suckling (143°53'36" W).

As long as the International Convention for the High Seas Fisheries of the North Pacific Ocean remains in effect (or it is replaced by an equivalent convention), the Council leaves the management of the salmon fisheries west of 175° east longitude under the control of the International North Pacific Fisheries Commission (or equivalent organization). Otherwise, this plan will govern the salmon fisheries in the EEZ west of 175° east longitude as an integral part of the West Area.

The West Area is the area of the EEZ off the coast of Alaska west of the longitude of Cape Suckling (143°53'36" W.). It includes the EEZ in the Bering, Chukchi, and Beaufort Seas, as well as well as the EEZ in the North Pacific Ocean west of Cape Suckling.

The East Area is the area of the EEZ off the coast of Alaska east of the longitude of Cape Suckling.

2.2 Fisheries

Except as provided by other Federal law (see Appendix C), this plan allows commercial salmon fishing only in the East Area. It allows sport (or recreational) salmon fishing in the West and East areas. Specific regulations are promulgated by the Alaska Department of Fish and Game.

2.2.1 The Sport (or Recreational) Salmon Fishery.

The sport fishery for salmon in marine waters off Alaska takes place almost entirely within State waters (there is little reason for sport fishermen to fish for salmon seaward of State waters). The little sport fishing that does occur in the EEZ (primarily the charter boat fishery) takes place to a minor extent in both areas, but the sport harvest of salmon from the

EEZ is probably less than several hundred salmon for both areas combined.

2.2.2. The Commercial Salmon Fishery in the West Area.

In the West Area, the only commercial salmon fishery is the incidental fishery allowed under 50 CFR 210 (see Appendix C). Federal regulations implementing the North Pacific Fisheries Act (16 U.S.C. 1021, et seq.), prohibit U.S. fishermen from fishing for or taking salmon with nets in the North Pacific outside Alaskan waters except for three historical fisheries managed by the State; these are the (a) False Pass (South Peninsula), (b) Cook Inlet, and (c) Copper River net fisheries. These fisheries technically extend into the EEZ, but they are conducted and managed by the State of Alaska as nearshore fisheries. Thus, aside from those traditional fisheries, this plan prohibits commercial salmon fishing in the EEZ west of the longitude of Cape Suckling.

2.2.3 The Commercial Troll Salmon Fishery in the East Area.

Within the East Area, the troll fishery (hand-troll and power-troll) is the only commercial salmon fishery allowed. From Alaska statehood in 1959 until 1979, this fishery was conducted and managed with little recognition of the boundary separating Federal from State waters, although at one time the State banned hand trolling seaward of the surf line. Upon implementation of the Council's plan in 1979, the fishery in the Federal EEZ came under Federal regulations even though the trollers continued to fish in State and Federal waters as if the troll fishery were a unit.

Entry into the troll fishery is limited by the Alaska Commercial Fisheries Entry Commission and the North Pacific Fishery Management Council. At the present time, only two trollers have Federal limited-entry permits; the rest have Alaska limited entry permits (Tables 1 and 2). The Council's original plan contains descriptions of the Alaska and Federal limited entry systems (NPFMC, 1978). The appendix tables contain information on the number of permits issued to residents and nonresidents of Alaska and average prices for permits.

Commercial trolling in the East Area takes place in two seasons. A winter troll fishery (15 October through 14 April) takes place in internal waters of Southeast Alaska lying east of the ocean surfline and in Yakutat Bay; all outer coastal areas and the EEZ are closed during the winter fishery. The summer troll fishery now takes place from June through 20 September in three parts: (1) a June fishery in small defined areas within Alaska's internal waters, (2) a fishery adjacent to certain

Table 1. Number of Troll Permits Issued, 1977 through 1987.^{a,b}

Year	Federal		State			Total		Total
	Power		Hand	Power		Interim	Permanent	
	Interim	Permanent		Interim	Permanent			
1977	0	2,953	0	41	929	2,994	929	3,923
1978	0	3,923	0	42	934	3,965	934	4,899
1979	1	3,702	0	40	940	4,142	940	5,082
1980	2	2,436	0	35	941	2,571	941	3,512
1981	1	2,048	0	31	940	2,079	940	3,019
1982	2	1,213	696	28	942	1,241	1,638	2,879
1983	2	29	2,121	29	941	58	3,062	3,150
1984	2	27	2,120	23	942	50	3,062	3,112
1985	2	44	1,985	21	944	65	2,929	2,994
1986	1	18	1,965	15	943	33	2,908	2,941
1987	1	12	1,929	16	943	29	2,982	2,900

^a Federal permits are permanent but nontransferrable. State interim-use permits are issued to fishermen until the State confirms or denies their rights for a permanent, transferrable permit.

^b Source: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 29 August 1988.

Table 2. Number of Troll (Interim and Permanent) Permit Holders Landing Salmon, 1977 through 1986.^a

Year	Federal		State		Total
	Power		Hand	Power	
1977	0	1,836	750	2,586	
1978	0	2,624	816	3,440	
1979	1	2,207	819	3,026	
1980	2	1,667	842	2,509	
1981	1	1,153	793	1,946	
1982	2	1,067	810	1,877	
1983	2	945	810	1,755	
1984	2	859	795	1,654	
1985	2	903	830	1,733	
1986	1	692	825	1,617	

^aSource: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 29 August 1988.

Alaska salmon hatcheries to harvest surplus chinook salmon returning to the hatcheries, and (3) a general summer season in State and Federal waters. All are under a harvest limit set by the Pacific Salmon Treaty.

Beginning in 1985, the Pacific Salmon Treaty imposed a ceiling on the harvest of chinook salmon by all fisheries in Southeast Alaska. From 1985 through 1989, that ceiling has been 263,000 chinook salmon; this is known as the base quota. The Alaska Board of Fisheries subdivides this quota into harvest guidelines for the three major groups of fishermen: troll (221,000), net (20,000), and recreational (22,000).

In addition to the base quota, the Pacific Salmon Commission has allowed Alaska an unlimited harvest of chinook salmon produced by its new salmon enhancement activities, i.e., salmon produced by Alaska's salmon enhancement activities beyond those produced before the treaty was signed (a harvest of 5,000 chinook). In computing this supplemental ("addon") harvest, Alaska estimates the number of chinook salmon in the harvest from its enhancement activities, subtracts the "old" enhancement contribution of 5,000, and subtracts a risk adjustment to account for errors in the estimates. Each fishery is allowed to harvest as much of this supplemental harvest as it can during the fishing seasons.

The Alaska troll fisheries for coho, sockeye, pink, and chum salmon operates without any Pacific Salmon Treaty quotas; however, in 1989, the Alaska Board of Fisheries set harvest guidelines for the commercial harvests of coho in terms of percentages of the total Southeast Alaska commercial coho harvest: troll (61 percent), purse seine (19%), drift gillnet (13%), and set gillnet (7%).

The winter troll fishery, which began in 1970, has taken an increased share of the chinook salmon harvest, with a peak of 60,429 in during the winter of 1987-1988 (Figure 2). During 1988-1989, the winter fishery harvested about 34,300 chinook salmon, 14.5 percent of the total 1989 troll chinook harvest. The winter troll harvest comes from the all-gear harvest limit, but it has no specific harvest limit. Appendix D, table 12 summarizes the harvests of the winter troll fishery from 1970 through 1989.

The June fisheries began in 1984 and are designed to develop methods for harvesting chinook salmon returning to Alaska's salmon hatcheries. A June experimental fishery is conducted a few days during specified periods in areas near certain Alaskan salmon hatcheries or on the chinook salmon migration routes to the hatcheries. The experimental fishery is designed to evaluate the present of Alaskan hatchery stocks in relation to natural stocks and to determine the feasibility of harvesting pink and

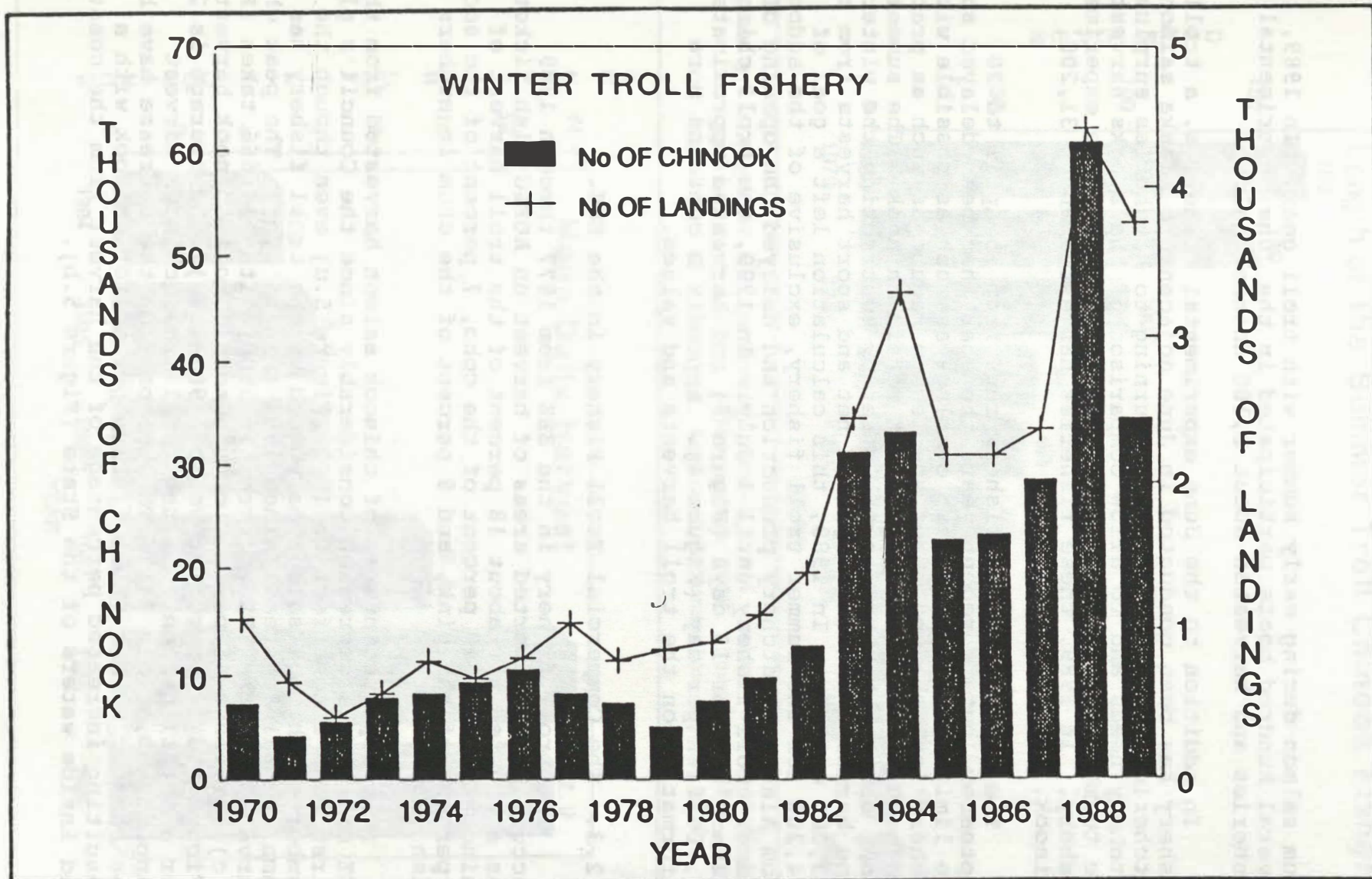


Figure 2. Chinook salmon harvests by the Southeast Alaska winter troll fishery, 1970 through 1989. Source: ADF&G Report to the Board of Fisheries, Regional Information Report 1J90-02.

chum salmon during early summer with troll gear. In 1989, several hundred boats participated in the June experimental fisheries and harvested about 2,100 chinook salmon.

In addition to the June experimental fisheries, a troll fishery has been conducted in June adjacent to Alaska salmon hatcheries to harvest salmon returning to hatcheries surplus to hatchery needs and to allow comparison of the stocks harvested in the terminal areas with those harvested in the June experimental fishery. In 1989, these fisheries harvested about 31,200 chinook.

The general summer fishery runs from 15 April to 20 September, but in recent years the start has been delayed so that the limited chinook harvest overlaps as much as possible with the fishery for coho and other species to reduce as much as practical the period when trollers can not retain chinook. The summer troll chinook harvest level is set by subtracting the winter and June harvests and the expected net and sport harvests from the 263,000 ceiling. In 1989, this calculation left a goal of 154,200 for the summer troll fishery, exclusive of the add-on from Alaska's hatchery production and delayed the opening of the summer troll fishery until 1 July. In 1989, the troll chinook fishery ran for 13 days (Figure 3) and harvested approximately 12,900 fish per day (Figure 4). Appendix D contains more information on the troll harvests and values.

2.2.3. The Commercial Troll Fishery in the EEZ.

The troll fishery in the EEZ from 1977 through 1989 (according to reported areas of harvest on ADF&G fish tickets) has accounted for about 18 percent of the troll harvest of chinook salmon, 10 percent of the coho, 7 percent of the sockeye, 6 percent of the pink, and 8 percent of the chum in numbers of fish (Table 3).

The reported number of chinook salmon harvested from the EEZ off Alaska decreased considerably since the Council's plan first went into effect in 1979 (Figure 5.c) even though the total number of chinook salmon harvested by the troll fishery has remained fairly steady since 1981 (Figure 5.a). The peak chinook harvest from the EEZ occurred in 1980, with 134,666 taken (Figure 5.c), or about 45 percent of the total troll chinook harvest (Figure 5.d). In recent years (1985-1989), the average is 25,114 (or about 11 percent) of the total troll chinook harvest (Appendix D, Table 14). The reasons for the decrease have been the shorter summer troll fishing period for chinook with a resulting increased percentage of the harvest from the coastal and inside waters of the State (Figure 5.b).

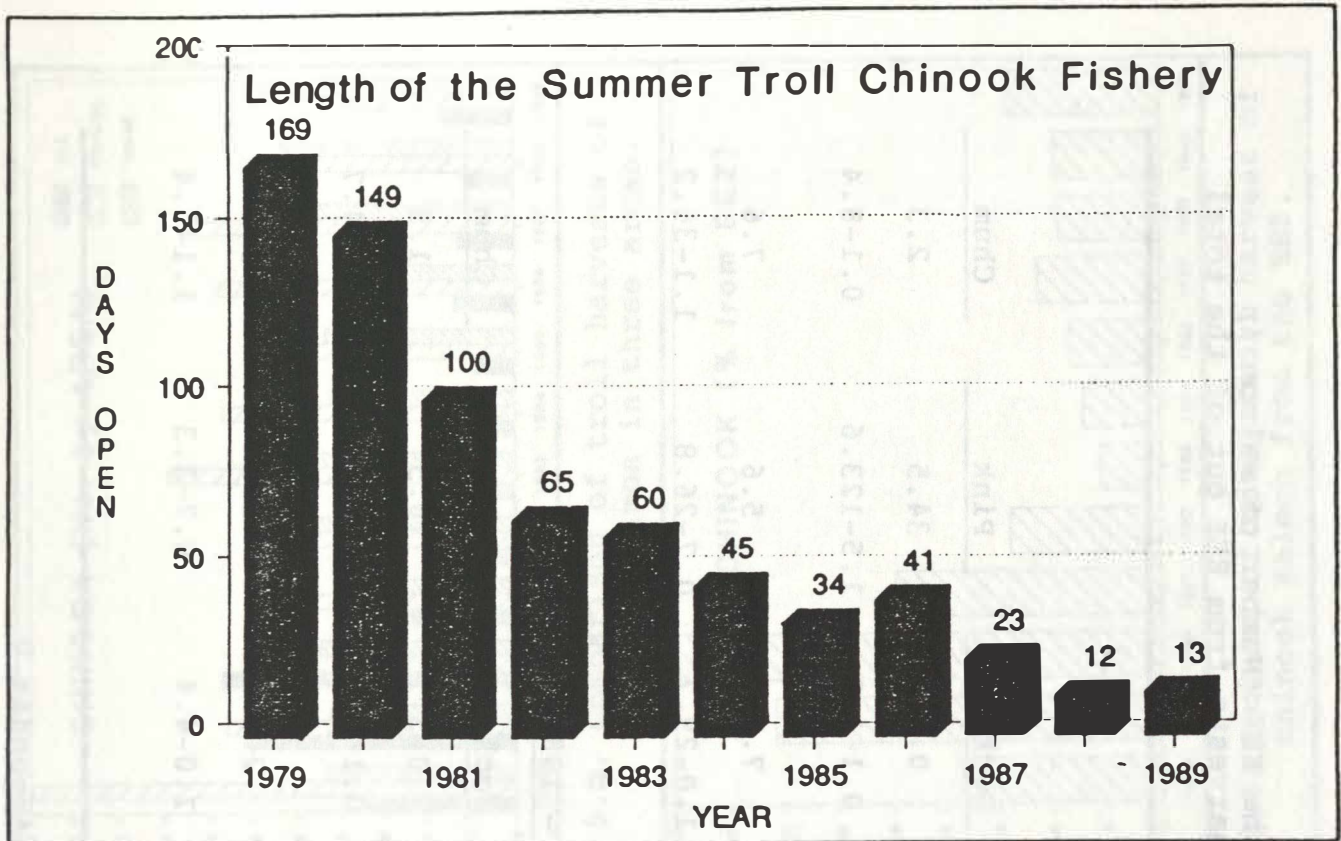


Figure 3. Length of the commercial summer troll fishery for chinook salmon in Southeast Alaska, 1978 through 1989. Source: ADF&G, Report to the Board of Fisheries, Regional Information Report 1J90-02.

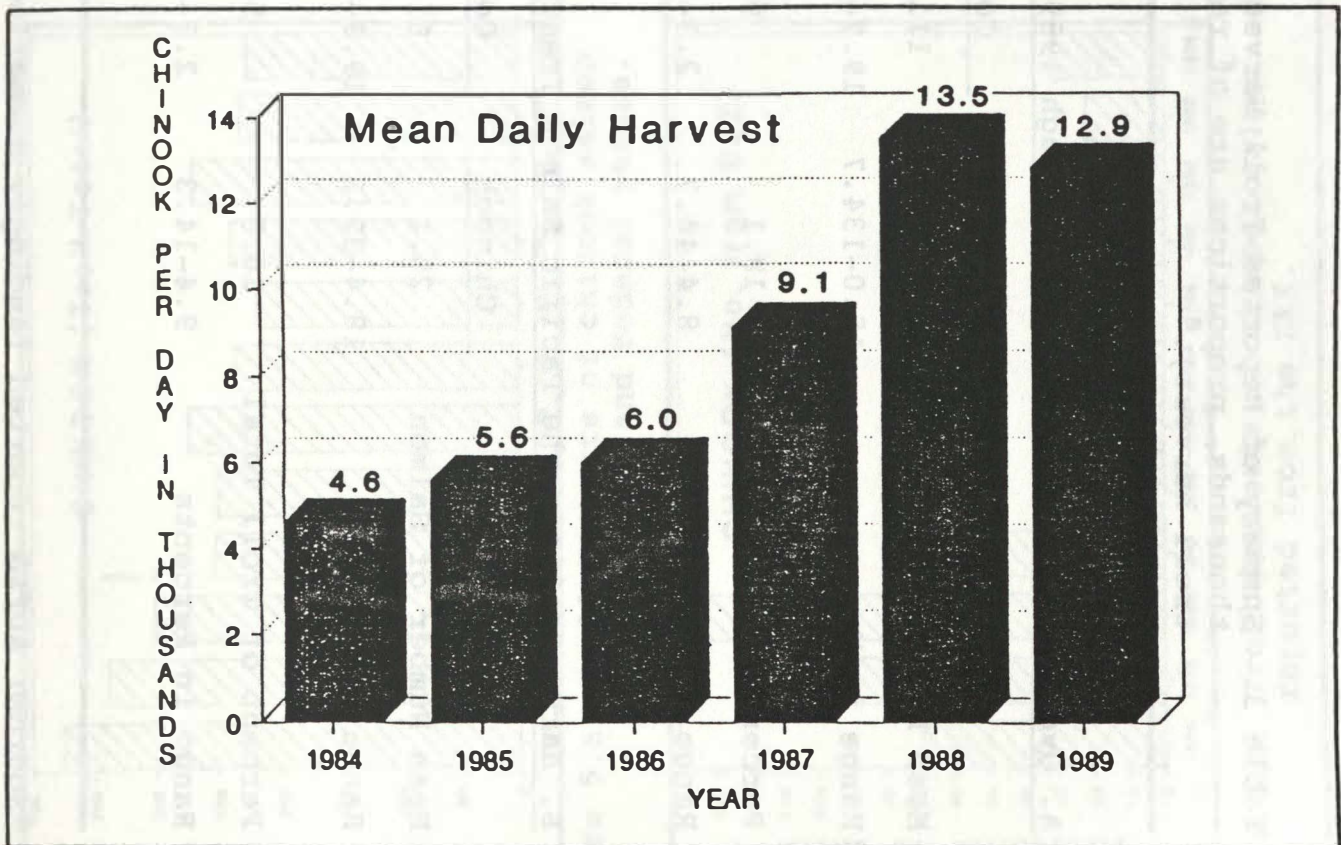


Figure 4. Mean daily harvest rate of chinook salmon by the Southeast Alaska commercial troll fishery during the summer season, 1984 through 1988. (Ibid.)

Table 3. Summary of Reported Troll Harvest from the EEZ (Number of salmon in thousands, proportions are of reported harvests from EEZ out of the total troll harvest).^a

A. Overall Averages from 1978 through 1989

	<u>Chinook</u>	<u>Coho</u>	<u>Sockeye</u>	<u>Pink</u>	<u>Chum</u>
Mean Number of Salmon	48.3	111.0	0.6	34.5	2.3
Range in Means	15.0-134.7	19.9-293.2	0.1-1.8	1.5-123.6	0.1-8.4
Percent of Troll Total	18.1	9.9	7.5	5.6	7.6
Range in Percents	8.4-44.7	2.3-41.4	1.0-29.7	0.7-26.8	1.1-34.2

B. Harvests Since the Pacific Salmon Treaty (1985 - 1989)

	<u>Chinook</u>	<u>Coho</u>	<u>Sockeye</u>	<u>Pink</u>	<u>Chum</u>
Mean Number of Salmon	25.1	61.3	0.3	10.5	1.8
Range in Means	18.4-32.2	19.9-90.7	0.1-0.4	1.5-16.2	0.4-4.7
Percent of Troll Total	10.6	5.0	2.6	1.4	3.8
Range in Percents	9.4-14.3	2.3-8.2	1.0-4.4	0.7-3.3	1.1-5.4

^aSource: ADF&G reported landings, summarized from Appendix D.

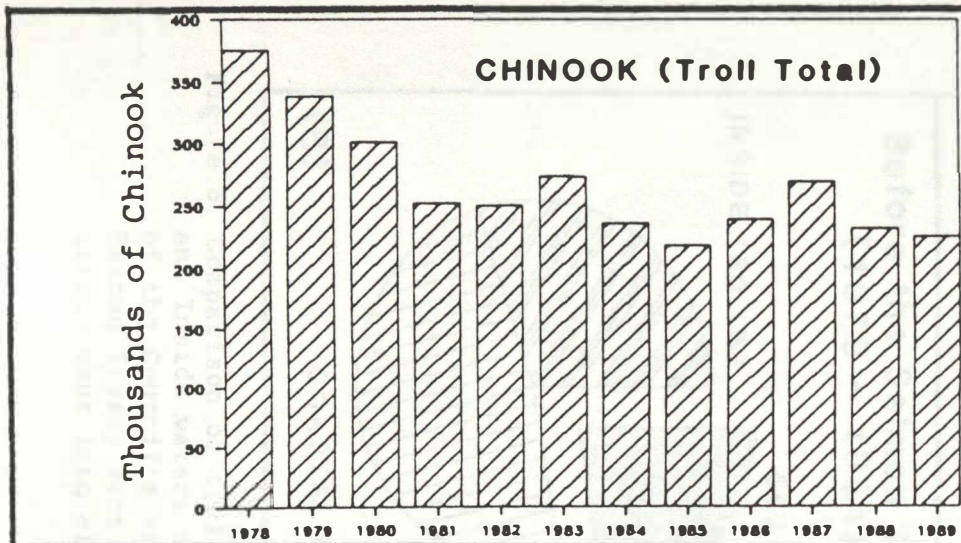


Figure 5.a. Troll harvests of chinook salmon from Alaskan and Federal waters.

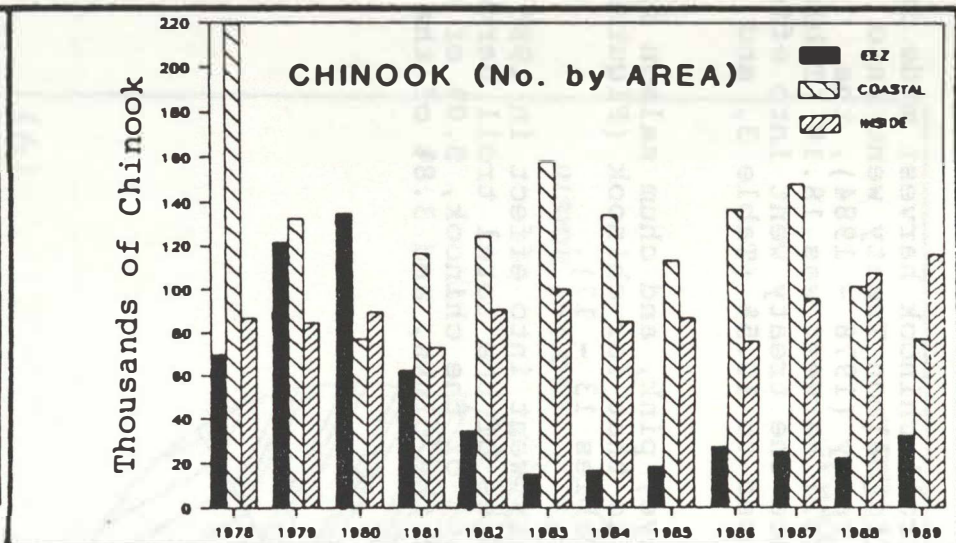


Figure 5.b. Comparison of troll harvests of chinook salmon in three areas.

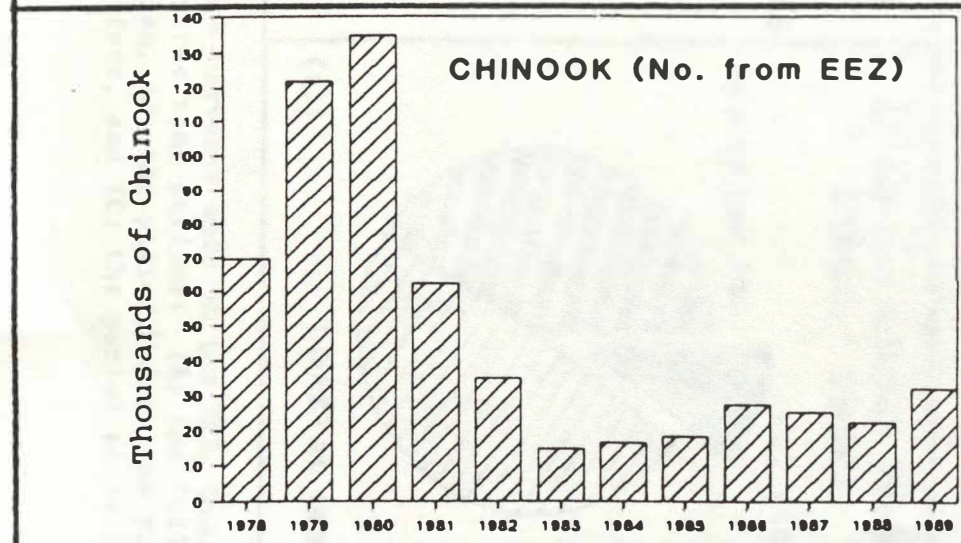


Figure 5.c. Troll harvests of chinook salmon reported from the EEZ.

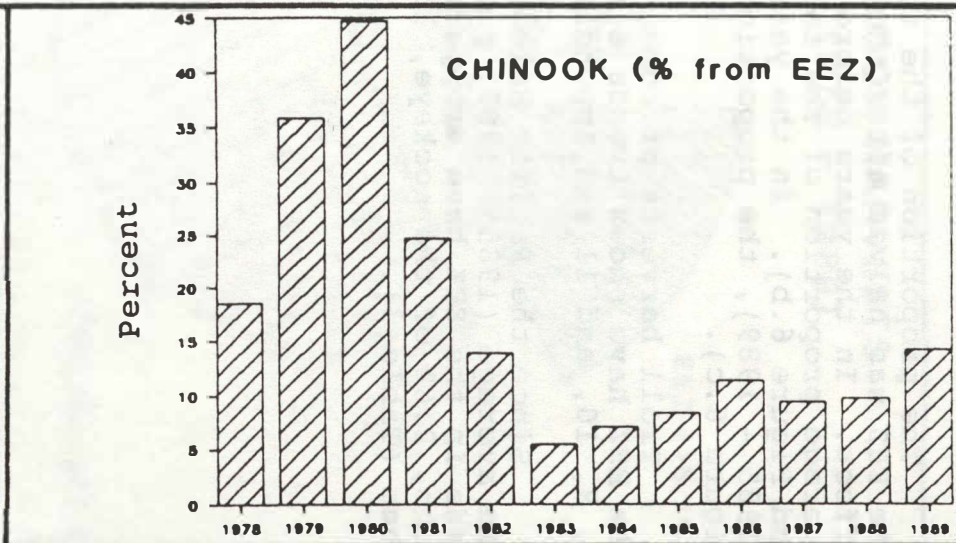


Figure 5.d. Percent of total troll harvest of chinook salmon from the EEZ.

The proportion of the total troll chinook harvest made in the EEZ was halved after the Pacific Salmon Treaty went into effect. In the years before the treaty (1978 - 1984), the average proportion of the total troll harvest was 18.1% (Table 3, and Figure 6.b). In the years since the treaty went into effect (1985 - 1989), the proportion dropped to 10.5% (Table 3, and Figure 6.c).

Troll harvests of coho, sockeye, pink, and chum salmon from the EEZ have shown trends similar to that for chinook (Figures 7, 8, 9, 10, and 11 and Appendix D, Tables 13 - 17).

Since the Pacific Salmon Treaty went into effect in 1985, the average (1985 - 1989) percentages of the total troll harvest made in the EEZ have dropped: 10.6% of the chinook, 5.0% of the coho, 2.6% of the sockeye, 1.4% of the pinks, and 3.8% of the chum (Table 3).

**TROLL CHINOOK HARVESTS
(Average 1978 - 1989)**

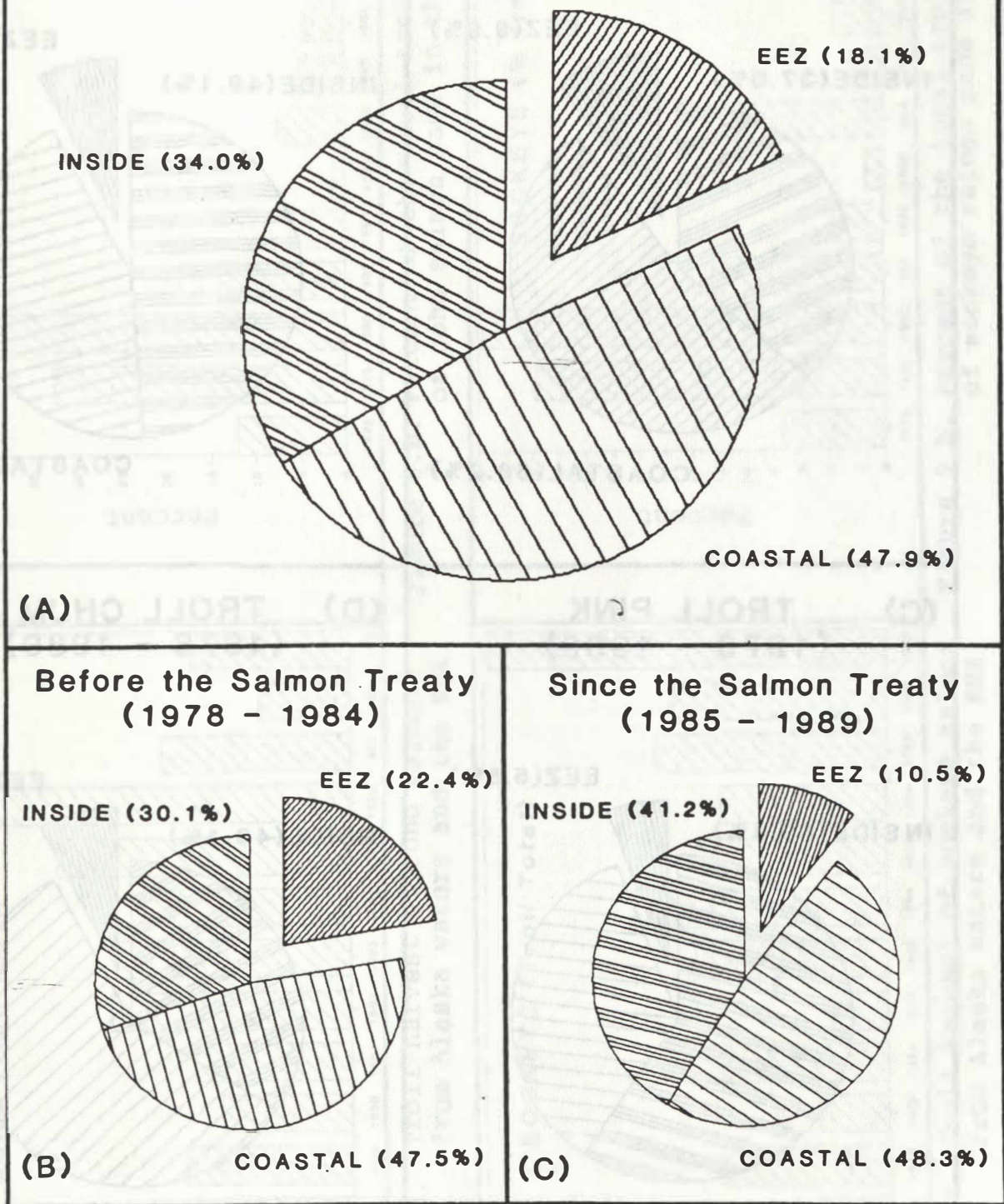


Figure 6. Comparison of troll chinook harvests made in the EEZ, Coastal, and Inside waters during three time periods: (A) the full period of the Council's salmon plan, (B) the period before the Pacific Salmon Treaty went into effect, and (C) the period since the salmon treaty went into effect.

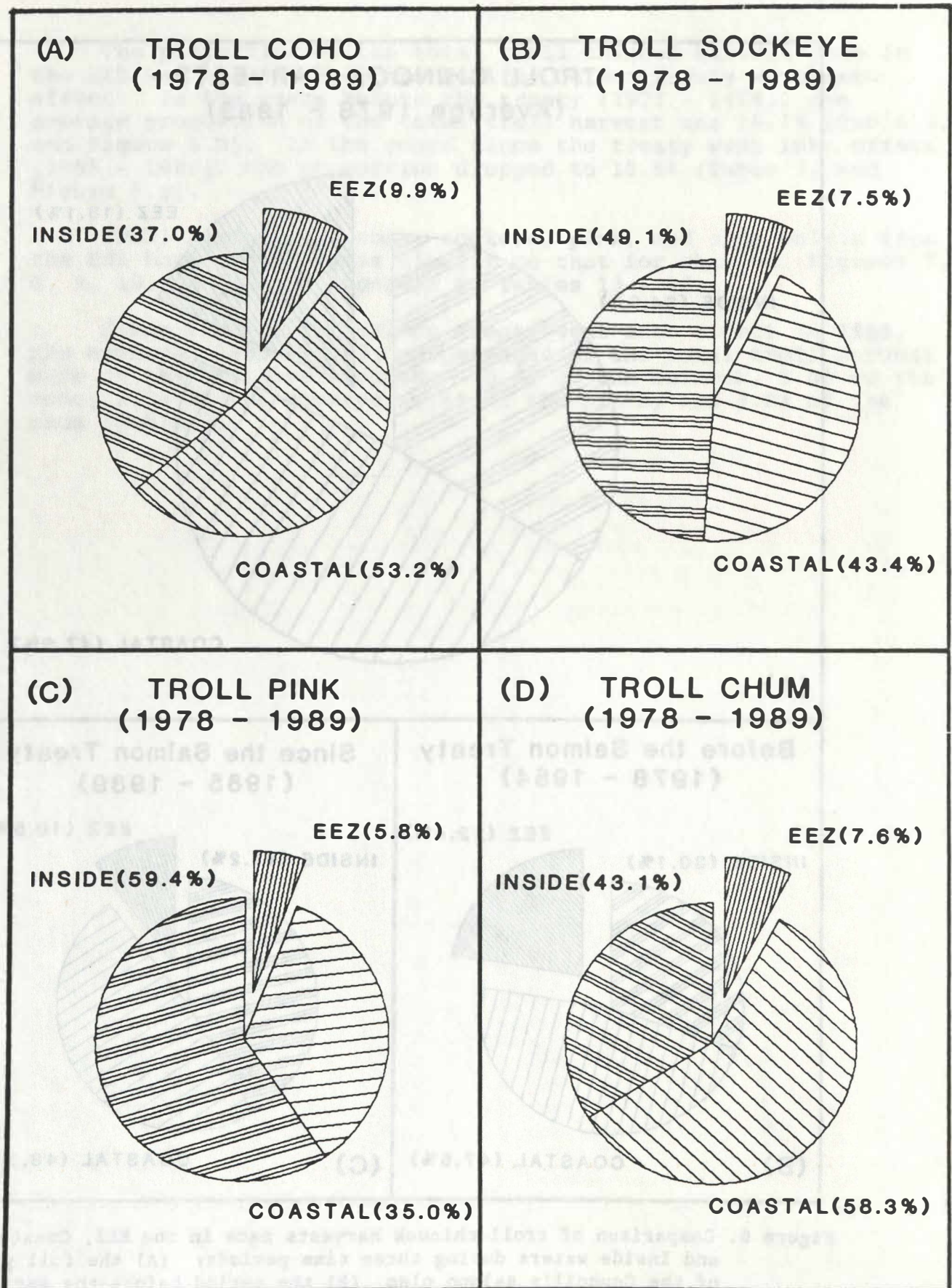


Figure 7. Comparison of troll harvests made in the EEZ, Coastal, and Inside waters from 1978 through 1989 for (A) coho, (b) sockeye, (C) pink, and (D) chum salmon.

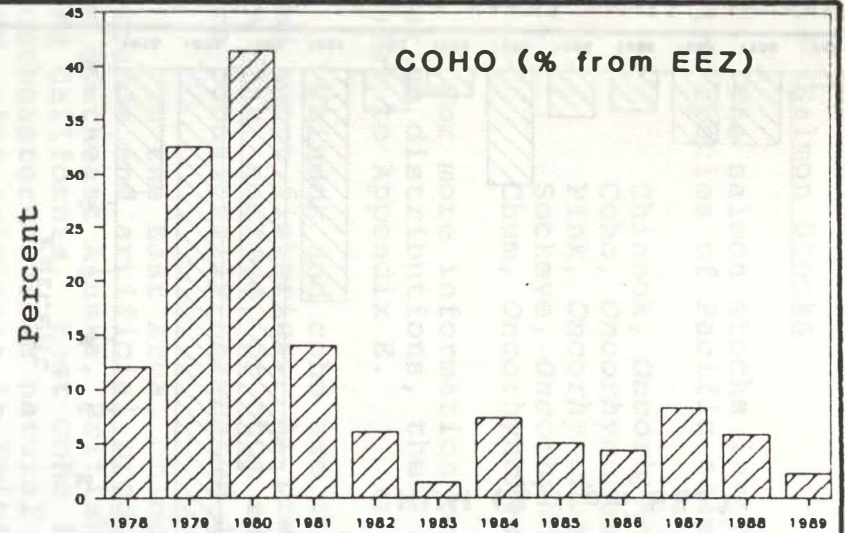
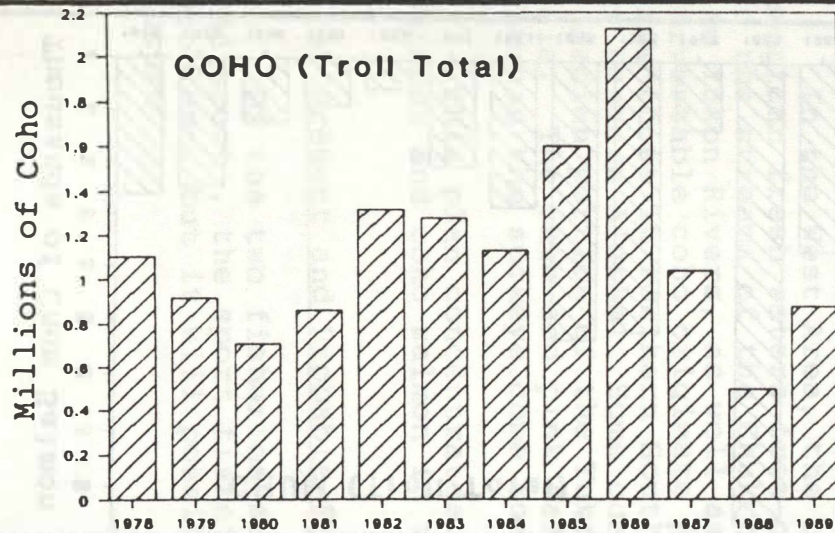


Figure 8.a. Troll harvest of coho salmon from Alaska waters and the EEZ.

Figure 8.b. Percent of the total troll harvest of coho salmon made in the EEZ.

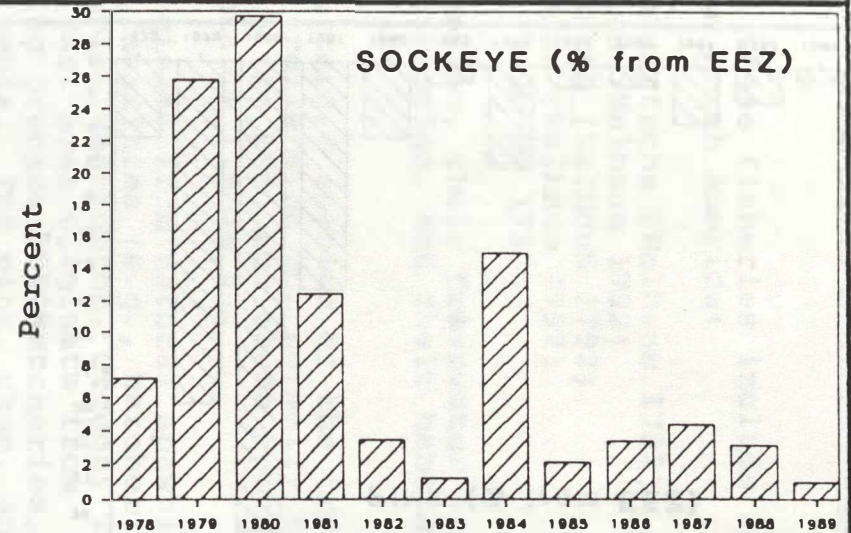
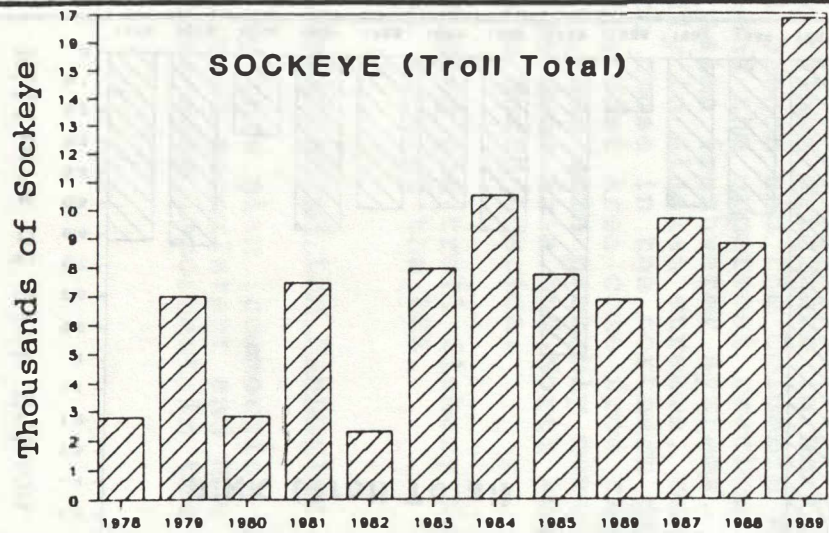


Figure 9.a. Troll harvest of sockeye salmon from Alaska waters and the EEZ.

Figure 9.b. Percent of the total troll harvest of sockeye salmon made in the EEZ.

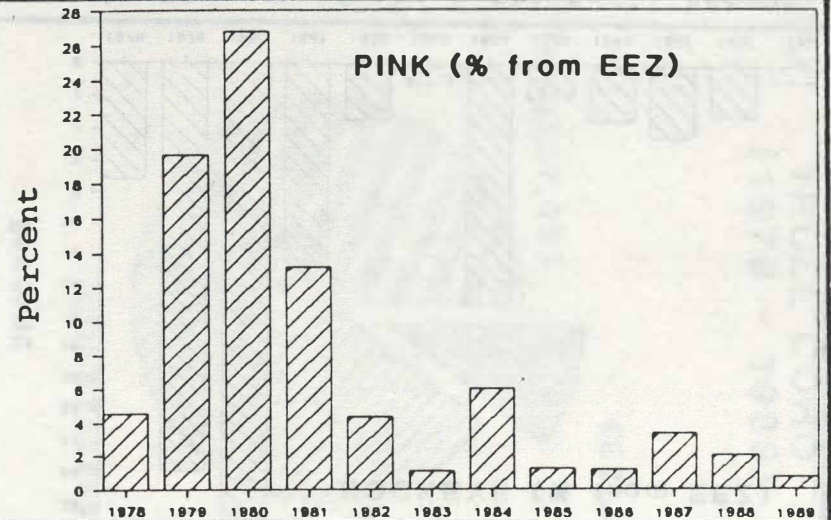
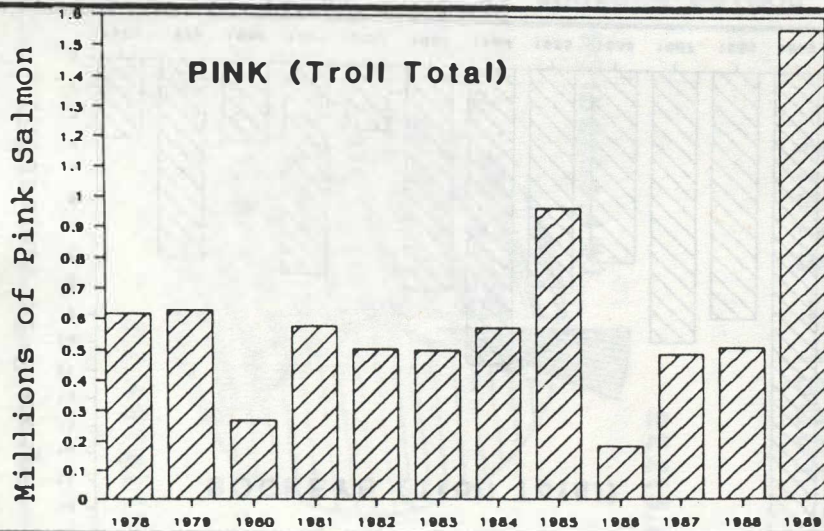


Figure 10.a. Troll harvest of pink salmon from Alaska waters and the EEZ.

Figure 10.b. Percent of the total troll harvest of pink salmon made in the EEZ.

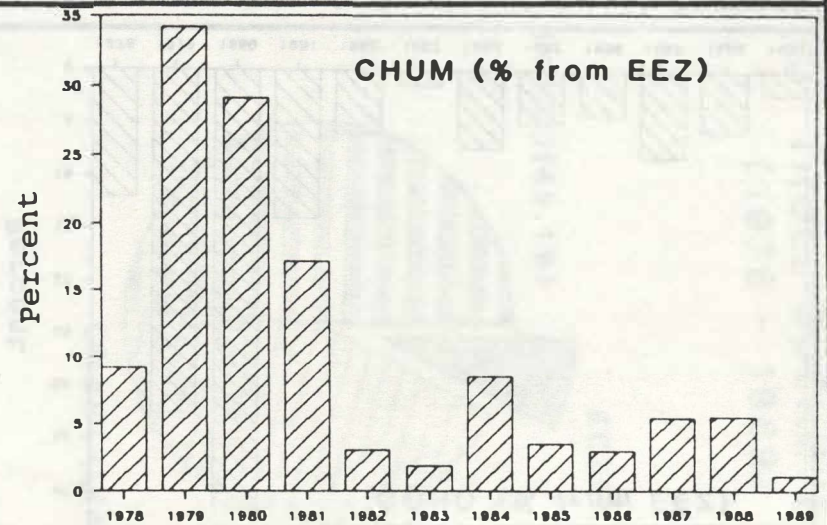
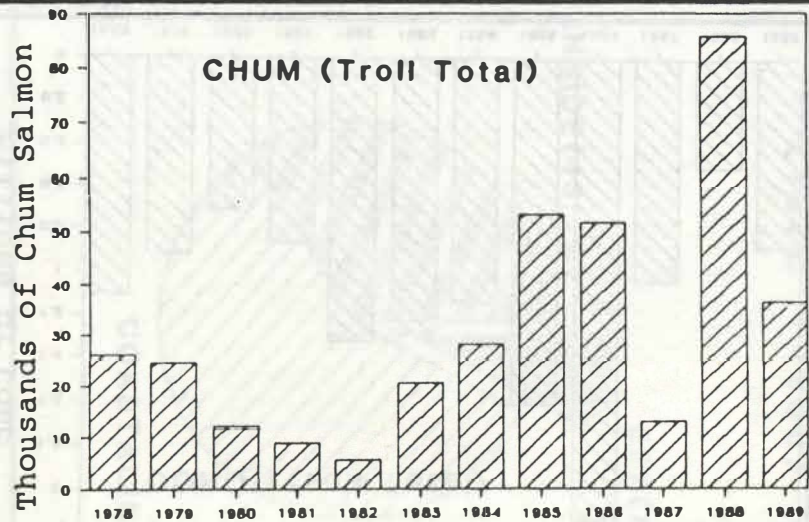


Figure 11.a. Troll harvest of chum salmon from Alaska waters and the EEZ.

Figure 11.b. Percent of the total troll harvest of chum salmon made in the EEZ.

2.3 Salmon Stocks

The salmon stocks involved in these fisheries include all five species of Pacific salmon from North America:

Chinook, *Oncorhynchus tshawytscha* (Walbaum 1792)
Coho, *Oncorhynchus kisutch* (Walbaum 1792)
Pink, *Oncorhynchus gorbuscha* (Walbaum 1792)
Sockeye, *Oncorhynchus nerka* (Walbaum 1792)
Chum, *Oncorhynchus keta* (Walbaum 1792)

For more information on the salmon, their freshwater and marine distributions, their life histories, and their habitat, refer to Appendix E.

Chinook and coho are the main target species of the troll and sport fisheries. At present, trollers do not normally target on pink, sockeye, or chum salmon in the EEZ, but these species are occasionally harvested incidentally (Table 3).

In the East Area, chinook originate from natural spawning grounds and artificial production facilities (e.g., hatcheries) in Southeast Alaska, British Columbia, Washington, Oregon, Idaho, and California. Most coho in the East Area originate from Southeastern Alaska natural spawning grounds and hatcheries, but some also originate in British Columbia. The pink, chum, and sockeye originate mostly from Southeast Alaska natural spawning grounds, but some also come from British Columbia.

In the West Area, the chinook salmon originate in North American fresh waters from coastal Oregon and the Columbia River to the streams of the Chukchi Sea and the uppermost reaches of the Yukon Rivers, as well as from Asian freshwater systems. Harvestable coho originate primarily in Alaskan streams, ranging from those in southern Southeast to those in the northern parts of Western Alaska. Some coho in the West Area come from the Canadian portion of the Yukon River, and some probably come from Asia. The chum and pink salmon come from Asia and North America, whereas the sockeye come mostly from North America.

This plan concentrates on managing the troll fishery for chinook and coho salmon in the East Area of the EEZ.

2.4 Present and Probable Future Condition of the Fisheries

Of the two fisheries managed by this plan (commercial troll and sport), the sport fishery is almost nonexistent and has no problems, but it will possibly become more important in the future.

The Southeast Alaska commercial troll fishery presently consists of two parts: (a) the summer troll fishery in the EEZ and Alaskan waters and (b) the winter troll fishery in certain Alaskan waters. Hand-trollers as well as power-trollers operate in both parts, although the winter fishery consists of a smaller part of the fleet and has a greater percentage of power trollers.

As a whole, the troll fishery likely has too many participants (is "overcapitalized")--in spite of Alaskan and Federal limited-entry systems. In 1988, for example, 957 power trollers and 1,868 hand trollers were permitted to troll for salmon, a total of 2825 trollers (Table 1).

This large number of trollers combined with harvest limits for chinook salmon, annual variations in the numbers of other salmon species, and the recent expansion of the winter troll fishery in Alaska's internal waters for chinook salmon have shortened the fishing periods in the EEZ considerably (Figure 3). For example, in 1977, when the Council first adopted a plan for the troll fishery in the EEZ, trollers were allowed to harvest chinook salmon from 15 April until 30 September, a fishing period of 169 days. In 1989 (12 years later), the period trollers were allowed to harvest chinook salmon in the EEZ had declined to 13 days! The troll chinook harvests in those two years (including the winter troll fishery in State waters) were similar: 271,000 chinook in 1977, 225,481 chinook in 1989.

The winter troll fishery, which began in 1970, has taken an increased share of the chinook salmon harvest, with the peak of 60,429 chinook during the winter of 1988-1989 accounting for 26 percent of the total 1988 troll chinook harvest. During the winter of 1989-1990, the harvest came to 34,300 chinook of which approximately 14 percent originated from Southeast Alaska hatcheries (compared to about 3% in the 1989 summer fishery). The June experimental and hatchery fisheries in 1989 accounted for an additional 33,300 chinook, with a hatchery contribution of about 16 percent. To date, the Alaska Board of Fisheries has set no limit on the number of chinook salmon the winter or June troll fisheries may harvest. With the, generally, high prices paid for winter chinooks and the increasing production of chinook salmon by Southeast Alaska's salmon hatcheries, these fisheries will probably continue to grow, perhaps at the expense of the summer troll fishery.

On the positive side, the natural runs of chinook salmon are rebuilding under the restrictions imposed by the Pacific Salmon Treaty. Figure 12 shows a general increase in the number of chinook salmon spawning naturally in the rivers of Southeast Alaska and the transboundary rivers of Alaska and Canada. Under the rebuilding program, the depressed natural chinook salmon runs are supposed to be rebuilt by 1998.

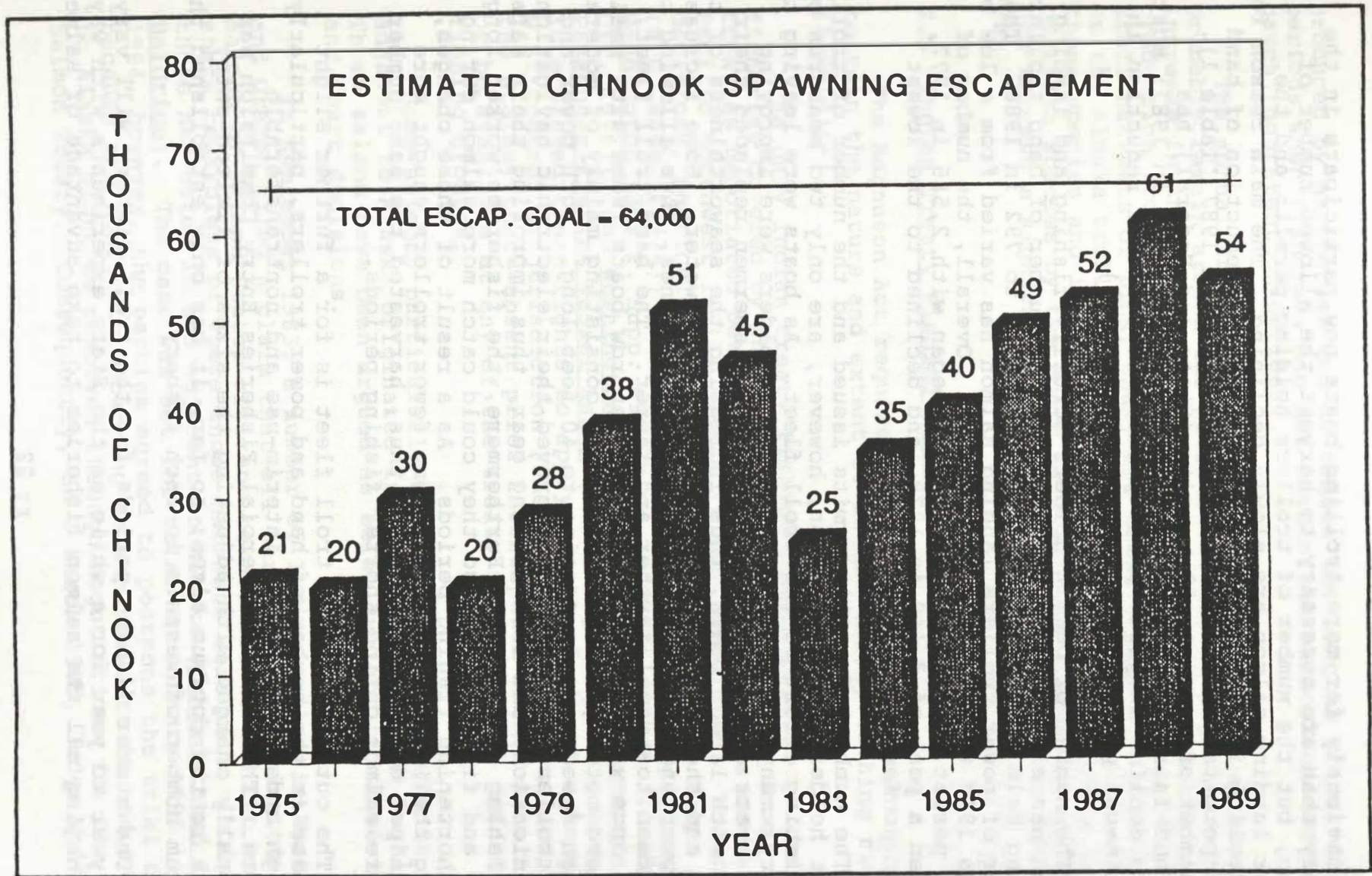


Figure 12. Estimated total spawning escapement of chinook salmon to Southeast Alaska and the Canada-U.S. transboundary rivers, 1975 through 1989. Source: ADF&G Report to the Board of Fisheries, Regional Information Report 1J90-02.

Obviously far more trolling boats now participate in the fishery than are necessary to harvest the allowed number of salmon, but the number of trollers holding permits and the number landing salmon are slowly declining. The main reason for the decline in the number of permits is the reduction of hand troll permits, from 2,953 in 1977 to 1,941 in 1987 (Table 1). The number of power troll permits (State and Federal) has remained fairly constant, from 970 in 1977 to 959 in 1987; most of the decline in power troll permits is due to a reduction in interim-use power troll permits (See Table 1).

The number of permit holders actually fishing and landing salmon has also declined (Table 2). The number of hand trollers landing salmon declined from 1,836 in 1977 to 792 in 1986. The number of power trollers landing salmon has varied from a low of 750 in 1977 to a high of 844 in 1980. Overall, the number of troll permit holders landing salmon began with 2,586 in 1977, reached a peak of 3,440 in 1978, and declined to the lowest number so far (1,617) in 1986.

The number of troll permits issued and the number of troll permit holders landing salmon, however, are only two measures of the fishing effort of the troll fleet. As boats were leaving the fishery, many of the remaining permit holders were improving their boats and fishing harder. Some fishermen replaced their boats with larger boats, thus increasing the seaworthiness of the boats and their ability to fish in rougher water. Some increased the power and fuel efficiency of their engines, thus allowing the fishermen to travel farther and faster. The hand troll fleet, which once was primarily small wooden row boats (some with small outboard motors) changed to a fleet consisting mainly of moderate to high speed vessels ranging to 40 feet long. Both power and hand trollers added to and improved their electronic navigation, communication, and fish-finding gear, thus improving their safety and fishing efficiency. Furthermore, the fishermen worked longer hours and fished harder so they could catch more salmon during the shortening fishing periods. As a result of these changes, during the intense summer season, fewer trollers caught more salmon per day (Figure 3) and, thus, harvested the same number or more salmon during shorter fishing periods.

The outlook for the troll fleet is for a further slight decrease in the number of hand and power trollers, particularly through a decrease in the interim-use and nontransferable permits. The Alaska Commercial Fisheries Entry Commission was originally charged with adjusting the sizes of limited-entry fleets to the optimum sizes; so far, it has only established the maximum number of vessels in each fishery.

The summer fishing periods for the troll fishery will vary from year to year for a while as the State experiments with ways of managing all the salmon fisheries to take advantage of salmon

produced by hatcheries and to reduce the lengths of or need for periods when fishermen can not retain the chinook salmon they catch (nonretention periods).

The annual troll harvests of chinook and coho salmon will probably remain around the present levels, with perhaps an increase in the numbers of chinook salmon landed as the production from Alaska's salmon hatcheries increase. Also, troll harvests of pink, chum, and sockeye salmon might increase as the Alaska trollers improve their techniques for catching those species and if they are allowed to increase their harvests of those species by the Board of Fisheries (Canadian trollers now harvest a significant portion of the Fraser River sockeye run).

2.5 Indian Treaty Fishing Rights

The Magnuson Act requires that fishery management plans contain the nature and extent of Indian treaty fishing rights (§303(a)(2)).

The only Indian treaty fishing rights related to the fisheries covered by this plan are those resulting from treaties negotiated between the United States and a number of Pacific Northwest Indian tribes in the late 1800s. Federal court decisions, particularly U.S. v. Washington (384 F. Supp. 312 (W.D. Wash. (1974))) and Sohappy v. Smith and U.S. v. Oregon and Washington (302 F. Supp. 899 (D.Or. (1969))), 529 F. 2d 570 (9th Cir. 1976)), and Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n (443 U.S. 658 (1979)) have interpreted these rights to apply to all stocks of salmon under U.S. control or jurisdiction (including jurisdiction exercised by the States) that--absent prior interception--would pass through or be available at any of the treaty tribes' usual and accustomed fishing grounds.

Some salmon, particularly chinook salmon, caught in and adjacent to Alaska originated in Oregon, Idaho, and Washington. These salmon have been argued as being subject to those treaties and court decisions.

In September 1983, a number of Indian tribes in Washington and Oregon filed a claim that all harvests of Washington-origin salmon by United States citizens be counted toward the non-Indian share regardless of where those harvests were made, including those harvested in and adjacent to Alaska (Confederated Tribes v. Baldrige). The case was set for trial in January 1985. In late 1984, however, the parties agreed to postpone the trial date because the conflict concerning salmon harvests in and adjacent to Alaska might be resolved through negotiations for the Pacific Salmon Treaty. Consequently, on 1 March 1985, Judge Walter E.

Craig issued a Stipulation and Order dismissing the Alaska defendants and stipulating that the allowable chinook harvests in and adjacent to Alaska will be determined by the U. S. Section of the Pacific Salmon Commission (U.S. District Court, Western District of Washington, No. 80-342). The stipulation became effective when the Pacific Salmon Treaty went into force on 15 March 1985.

In addition to Indian treaty fishing rights, a proclamation by President Warren G. Harding on 28 April 1916 created the Annette Island Fishery Reserve and established an exclusive fishing zone (3,000 feet wide) around the Annette Islands. Within this zone, the fisheries by Metlakatla Indians are regulated by the U.S. Department of the Interior and are managed by the U.S. Fish and Wildlife Service and the Metlakatla Community in cooperation with the Alaska Department of Fish and Game (25 CFR 88).

3.0 SPECIFICATION OF HARVEST LEVELS

All salmon harvested under this plan in the East Area are allocated for domestic harvesting; however, joint-venture processing is not expressly prohibited. Foreign harvesting of salmon within the EEZ covered by this plan is prohibited, except as allowed in the West Area under the North Pacific Fisheries Act and authorized by the International North Pacific Fisheries Commission or their successors.

3.1 Maximum Sustainable Yield (MSY)

Maximum sustainable yield is the largest annual harvest (or yield) that theoretically could be taken from a salmon stock on a sustained basis under a given set of environmental conditions.

For salmon, MSY is usually thought of as a range of the harvests that could be taken from a stock having an optimum number, sex ratio, and sizes of spawners (or "optimum spawning escapement") over a considerable time period under a given set of environmental conditions. Optimum spawning escapements, theoretically, will produce the largest number of returning adult salmon of appropriate sizes and ages to provide the optimum reproductive potential for each stock as well as the largest number of salmon for harvesting. For a given stock, MSY would be the difference between the amount of returning adults (absent any previous interceptions) and the optimum amount of spawners. The amount of MSY can be defined in terms of number of individuals, weight, or some combination of numbers and weight of salmon. Because of the year-to-year variability in stock strength and migrations routes, distribution and amount of fishing effort, uncertainties in determining optimum escapement and estimating run sizes and harvests, and other factors, MSY must be expressed as a range rather than as a single value.

Thus, MSY may be defined or estimated for an individual stock or a set of stocks that make up a management unit; however, it is unreasonable to estimate MSY for the aggregated salmon stocks harvested in the EEZ off Alaska by the troll fishery. These chinook, coho, pink, chum, and sockeye salmon belong to thousands of individual stocks (each with its own productivity potential), and all are harvested by fisheries other than the troll and sport fisheries in the EEZ. Many of the chinook stocks, for example, are harvested by sport and commercial fisheries in waters of the State of Alaska, British Columbia, and the U. S. Pacific Northwest. The proportions of the various stocks harvested by the troll fishery in the EEZ off Alaska varies substantially each year. Because we lack information on how many and where and when the salmon of each stock will be each year as well as accurate measures of the MSY of each stock, it is impossible to manage mixed-stock fisheries to obtain the MSY from

each stock. Furthermore, because of the annual change in fishing effort and efficiency, managers are unable to control precisely the harvests of the numerous fisheries to specific proportions of each stock. Accordingly, they manage the overall harvests from all the stocks by all the fisheries.

This variability plus the lack of information on the stocks (including the inability to identify the various stocks among the harvested fish and undefined optimum spawning escapements) precludes estimations of MSYs for most of the stocks contributing to the Alaska troll salmon fishery. Nor is it possible to isolate average yields available to the troll fishery from those available to other fisheries depending on the same stocks. The usual concept of MSY simply does not work in this situation; MSYs calculated this way have little meaning for any of the fisheries unless each fishery is consistently limited to a specific proportionate share of each stock's MSY.

An alternative approach for approximating MSY for a given fishery has been to use a mean (mathematical average) of recent harvests by that fishery over a suitably long period of time. Using that approach, Appendix Table 3.1 presents the means of the salmon harvested by the troll fishery in the EEZ off the coast of Alaska from 1976 through 1987. These values are expressed as ranges (highs, lows) and consist of the mean harvest plus or minus one standard error.

These mean values, however, are based primarily on the harvests of wild salmon stocks and do not account for the enhancement of the stocks achieved through improved harvest management, habitat protection, or artificial enhancement activities, some of which are being accelerated now.

3.2 Optimum Yield (OY)

The Magnuson Act defines optimum yield as the amount of fish that will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities and is prescribed on the basis of MSY, as modified by any relevant economic, social, or ecological factor.

For the troll fishery in the EEZ off Southeast Alaska, several economic, social, and ecological factors are involved in the definition of OY. Of particular importance are the annual variations in the abundance, distribution, migration patterns, and timing of the salmon stocks; provisions of the Pacific Salmon Treaty; decisions of the Pacific Salmon Commission; allocations by the Alaska Board of Fisheries; traditional times, methods, and areas of salmon fishing; and inseason indices of stock strength. Further, because the commercial troll fishery and the recreational fishery take place in the EEZ and State waters

without respect to the boundary between these two areas, the OY should not and cannot be subdivided into separate parts for the EEZ and State waters. Given these constraints, the OY for each species of salmon harvested under this plan is defined as allowable annual harvest levels.

Chinook salmon: The annual harvest levels for the troll and recreational fisheries within the EEZ off Southeast Alaska and within Alaskan waters are those numbers allocated by the Alaska Board of Fisheries based on the all-gear harvest ceilings set by the Pacific Salmon Commission. The salmon commission ceilings take into account the biological productivity of the chinook stocks contributing to all Southeast Alaska fisheries and the distribution of the harvest from those stocks among the various fisheries. Presently, these ceilings are designed to rebuild depressed chinook runs by 1998.

In addition to the base ceilings, the commission allows a region (e.g., Southeast Alaska) to harvest additional chinook salmon that the region can show come from its "new" enhancement activities as long as this harvest will not affect the commission's chinook rebuilding schedule. New enhancement activities are those that are expected to contribute salmon to the harvests beyond the number produced by a region's enhancement activities before the treaty was signed.

Coho salmon: The annual harvest levels for the troll and recreational fisheries within the EEZ off Southeast Alaska and within Alaskan waters will be determined inseason by the Alaska Department of Fish and Game under guidelines provided by the Alaska Board of Fisheries. The basis for these determinations will be indices of abundance of the various coho stocks and directives for allocating the harvests.

Other species: The annual harvest levels for pink, chum, and sockeye salmon are the number or weight of these salmon harvested by legal gear during open fishing periods in open fishing areas.

3.3 Domestic Annual Harvesting Capacity (DAH)

Domestic Annual Harvesting Capacity is the expected amount of the allowable harvest of salmon that the domestic fisheries (subsistence, sport, and commercial) are capable of harvesting in one year. The Council has determined that domestic harvesters are able to and expect to harvest the entire OY of salmon each year.

The domestic harvest may be processed either by domestic (DAP) or foreign (JVP) processors or both. Processing means preparing one or more fresh, whole salmon to prevent the flesh from deteriorating and to make it suitable for human consumption,

industrial uses, or long-term storage. Processing includes, but is not limited to, gilling and gutting, heading and gutting, icing, refrigerating, freezing, cooking, canning, smoking, salting, drying, vacuum packing, rendering into meal and oil, and other preparation and preservation processes.

3.4 Domestic Annual Processing Capacity (DAP)

Domestic annual processing capacity is the estimated portion of the domestic harvest (DAH) that U.S. processors expect to process. For salmon, DAP means the amount of salmon harvested (and processed) by sport and subsistence fishermen, as well as that harvested by domestic commercial fishermen, less any of the commercial harvest delivered to joint-venture processors. In the past, domestic processors have been able to process the entire commercial troll harvest of salmon; the Council has no reason to expect that situation to change.

3.5 Joint-Venture Processing (JVP)

Joint-venture processing refers to fish harvested in a partnership by U.S. fishermen and processed by foreign processors. Neither the original plan nor the regulations implementing it have specified an amount for JVP. In the past, some joint-venture processing of salmon has taken place in Alaskan waters, particularly in Norton Sound and Bristol Bay, and some domestic harvesters have delivered unprocessed or whole fresh salmon caught within Alaskan waters to British Columbian ports. The Council still sees no need to specify any amount of salmon for joint-venture processing. Any joint venture for processing must be authorized. The Governor of Alaska has the authority to authorize joint-venture processing within State internal waters. For joint-venture processing in the EEZ, the foreign partner must be authorized under an international fisheries agreement and possess a valid and applicable permit (§201 of the Magnuson Act).

3.6 Total Allowable Level of Foreign Fishing (TALFF)

Except as provided under the International Convention for the High Seas Fisheries of the North Pacific Ocean, no foreign harvesting of salmon is allowed in the EEZ off the coast of Alaska by this plan. At the highest conceivable level of abundance, the allowable amount of salmon in the EEZ east of 175° W, can be harvested completely by U.S. domestic fisheries. Therefore, exclusive of allocations under the Convention, this plan specifies that there is no TALFF for salmon of all species.

4.0 OBJECTIVES FOR THE DOMESTIC FISHERIES

4.1 Introduction

The Council has been committed to develop, in cooperation with the State of Alaska, a long-range plan for managing salmon fisheries off the coast of Alaska. The goal of this effort has been to promote a stable regulatory environment for the seafood industry and maintain the health of the resources and environment. This document is that plan.

The National Standards of the Magnuson Act require any fishery management plan to be consistent with seven national standards (§301(a)). In summary, these national standards say a fishery management plan should (a) prevent overfishing while achieving on a continuing basis the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities, (b) base management measures on the best scientific information available, (c) manage the harvest of a stock of fish (or interrelated stocks of fish) as a unit or in close coordination, (d) not discriminate between residents of different states, (e) promote efficiency in the use of the fishery resources except that economic allocation can not be the sole purpose, (f) take into account and allow for variations, and (g) minimize costs and avoid unnecessary duplication.

The Pacific Salmon Treaty (Article III) requires each party to (a) conduct its fisheries and its salmon enhancement programs to prevent overfishing, provide for optimum production, and allow each party to receive benefits equivalent to the production of salmon originating in its waters; (b) cooperate with the other party in management, research, and enhancement; and (c) take into account the desirability of reducing interceptions, avoiding undue disruption of existing fisheries, and annual variations.

The following six specific objectives must be attained to satisfy those requirements as well as the comprehensive statement of goals adopted by the Council on 7 December 1984.

4.2 Management Objectives

Within the scope of the requirements of the Magnuson Act and the Pacific Salmon Treaty, the Council has identified the following six specific objectives for this fishery management plan. They relate to stock condition, economic and social objectives of the fishery, gear conflicts, habitat, weather and ocean conditions affecting safe access to the fishery, access of all interested parties to the process of revising this plan and its implementing regulations, and necessary research and

management. Each of these objectives requires relevant management measures. Several management measures may contribute to more than one objective, and several objectives may mesh in any given management decision.

The Council recognizes that these objectives cannot be accomplished by any fishery management plan for the EEZ alone. To that end, the Council considers this plan to represent its contribution to a comprehensive management regime for the salmon fisheries that will be achieved in concert with actions taken by the Pacific Salmon Commission and the State of Alaska.

4.2.1 Objective 1

Manage the troll fishery in concert with the Pacific Salmon Commission and the Alaska Board of Fisheries to obtain the number and distribution of spawning fish capable of producing the optimum total harvest on a sustained basis from the salmon stocks (wild and artificial) harvested in Southeast Alaska.

4.2.2 Objective 2

Allocate the optimum yield to the various Southeast Alaska user groups as directed by the Alaska Board of Fisheries.

4.2.3 Objective 3

Decrease where possible the incidental mortalities of salmon hooked and released, consistent with allocation decisions and the objective of providing the greatest overall benefit to the people of the United States.

4.2.4 Objective 4

Control fishing effort and salmon catches in outer coastal and offshore Southeast Alaskan waters to accomplish conservation and allocation goals.

4.2.5 Objective 5

Use fishery management techniques to allow full use of salmon returning to supplemental production systems while providing necessary protection for intermingling natural runs, which must be harvested at lower rates.

4.2.6 Objective 6

Continue working to improve the coastwide plans for managing harvests of chinook and other salmon.

4.3. Vessel Safety Objective

Upon request, and from time to time as appropriate, the Council and the State will consider, and may provide for, temporary adjustments, after consultation with the U.S. Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safety of vessels.

5.0 ROLES OF AGENCIES IN IMPLEMENTING THIS PLAN

The salmon and salmon fisheries in the EEZ off Alaska are international in scope and are subject to two international treaties as well as the Magnuson Act and the laws of the State of Alaska. Thus, the Council must coordinate its management of the salmon fisheries in the EEZ off Alaska with a number of regional, national, and international agencies. Chief among these are the Pacific Salmon Commission, the International North Pacific Fisheries Commission, the State of Alaska, and the U. S. Department of Commerce (including the National Oceanographic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS)).

5.1 Role of the North Pacific Fishery Management Council

The Council will amend the fishery management plan when necessary, and will maintain its salmon plan team to oversee the plan and report to the Council.

The Council accepts the harvest levels set by the Pacific Salmon Commission and the State of Alaska, as long as those levels are consistent with the Council's goals and the objectives of this plan. Further, it accepts the allocations of harvests among the various groups of fishermen set by the Alaska Board of Fisheries, as long as those allocations are consistent with the Council's goals and objectives and the National Standards of the Magnuson Act.

It defers regulation of the commercial troll and recreational salmon fisheries in the EEZ to the Alaska Department of Fish and Game (in accordance with the policies and directives of the Alaska Board of Fisheries) unless the Director of the Alaska Region of the National Marine Fisheries Service or his designee, after consulting with the members of the Council (by telephone if necessary) determines that he must issue a specific regulation for the salmon fisheries in the EEZ to ensure (a) that the objectives of the plan are met, (b) that Federal obligations under the Pacific Salmon Treaty and the Magnuson Act are met, (c) that the salmon stocks are not overharvested, and (d) that the various groups of fishermen receive reasonable opportunities to harvest their specified allocations.

Further, the Council reserves the right to specify management measures applicable to the EEZ that differ from those of the State if it deems the State actions to be inconsistent with this fishery management plan or the Magnuson Act.

5.2 Role of the U. S. Department of Commerce, NOAA, and NMFS

The Magnuson Act assigns to the Secretary of Commerce (Secretary) the authority to approve fishery management plans and implement them with Federal regulations and to provide the regional fishery management councils with a number of services. The Secretary has delegated some of this fishery management authority and responsibilities to the National Oceanic and Atmospheric Administration (NOAA), a major agency within the Department of Commerce, and NOAA, in turn, has delegated some of its authority and responsibilities to the National Marine Fisheries Service (NMFS), an agency within NOAA. In its regular activities, the Council works with the Secretary, the Department of Commerce, and NOAA through the Alaska Region of NMFS.

The NMFS Alaska Regional Director has been delegated the authority to approve fishery management plans and amendments adopted by the Council. Following his approval, the RD will transmit the approved plan or amendment, draft implementing regulations, and other documents to NMFS Headquarters for further review and implementation, according to the Magnuson Act; NMFS, NOAA, and Commerce regulations; and the NMFS Operational Guidelines for the Fishery Management Plan Process.

In addition, this plan authorizes the Regional Director to issue Federal limited-entry commercial power-troll permits or transfer authority to fish commercially for salmon in the EEZ under certain specific conditions. See §8.3.1.3 of the Council's original plan for managing the salmon fisheries for discussions of the Council's findings as to limited entry into the commercial salmon fisheries (NPFMC 1978). The exact regulations, restrictions, procedures, and conditions of these Federal limited-entry permits are contained in 50 CFR 674.4.

Staff of the NMFS Alaska Region will assist the Council staff in performing analyses and drafting documents, will participate on the Council's salmon plan team, and will consult with the Alaska Department of Fish and Game on regulations and inseason adjustments of regulations for the salmon fisheries in the EEZ.

The NMFS Enforcement Division, Alaska Region, will help enforce the regulations that implement this plan, in cooperation with the United States Coast Guard and the Alaska Department of Public Safety.

The NOAA Office of General Counsel, Alaska Region, will provide legal advice and will prosecute violators of Federal regulations.

5.3 Role of the State of Alaska

Four agencies of Alaska are involved in managing the salmon fisheries under its jurisdiction. The Alaska Board of Fisheries sets policy and promulgates the regulations, the Alaska Department of Fish and Game manages the fisheries according to the policies and regulations of the Board and State law, the Alaska Commercial Fisheries Entry Commission controls the amount of fishing effort, and the Alaska Department of Public Safety enforces the regulations.

With regulation of the salmon fisheries in the EEZ being deferred to the State of Alaska, the State will manage those salmon fisheries to the extent participating vessels are registered under the laws of the State of Alaska (16 USC 1856(3)).

5.3.1 The Alaska Board of Fisheries (Board)

The Council will rely on the Board of Fisheries to hold public hearings on proposed management measures, establish fishing seasons, and allocate harvests among groups of fishermen. The Council considers that the public review and comment process of the Alaska Board of Fisheries will satisfy most, if not all, of the Council's needs for public review, thereby making maximum use of limited State and Federal resources and preventing duplication of effort.

Each year, this Board solicits proposed changes to the regulations governing Alaska's fisheries. Usually, chief among those submitting proposals is the Alaska Department of Fish and Game. The Board distributes these proposals to the public for review and comment and then conducts open public meetings to evaluate and take action on the proposals. The fishing community has come to rely on this regularly scheduled participatory process as the basis for changing Alaska's fishing regulations.

Among those things considered by the Board are fishing periods and areas for the salmon fisheries, and the allocation of harvests among the various groups of fishermen.

The Board system provides for extensive public input, ensures necessary annual revisions, is flexible enough to accommodate changes in salmon abundance and fishing patterns, and is familiar to salmon fishermen, fish processors, and other members of the public.

5.3.2 The Alaska Department of Fish and Game (ADF&G)

The department manages the fisheries inseason and issues emergency regulations to achieve conservation objectives and to

implement allocation policies established by the Alaska Board of Fisheries. The department also monitors the fisheries and collects data on the stocks and the performance of the fisheries.

The department managed salmon fisheries in Federal waters from the time of statehood in 1959 until 1979 when the Council's salmon plan was first implemented, and has made substantial investments over the years in facilities, communications, information systems, vessels, equipment, experienced personnel capable of carrying out extensive management, research, and enforcement programs. Since 1979, the State has played the major role in managing the salmon fisheries off Alaska, and the Council, for the most part, has coordinated its management with the State.

Under this plan, the Council defers the regulation of the salmon fisheries in the EEZ off the coast of Alaska to ADF&G, unless the Director of the NMFS Alaska Region, after consultation with the members of the Council, determines there is a need to issue specific Federal regulations for the salmon fisheries in the EEZ to achieve the objectives of this plan or be consistent with the Pacific Salmon Treaty or Magnuson Act. The State regulations apply to the extent that participating vessels are registered under the laws of the State of Alaska.

As a part of their normal duties, regional staff of the Department prepare annual reports on the status of the stocks and the fisheries for each of the management regions. The Department will provide the Council with copies of these reports which will then serve as major components of the Council's annual Stock Assessment and Fishery Evaluation Report.

5.3.3 The Alaska Commercial Fisheries Entry Commission

The Commercial Fisheries Entry Commission is an independent, quasi-judicial State agency responsible for promoting the conservation and sustained yield management of Alaska's fishery resources and the economic health and stability of commercial fishing by regulating entry into the fisheries. The Commission's activities fall into three categories: licensing, research, and adjudication. In 1974, the Commission began establishing the maximum number of power trollers that may participate in the commercial salmon fisheries in Southeast Alaska; in 1982, it began limiting hand trollers.

5.3.4 The Alaska Department of Public Safety.

The Fish and Wildlife Protection Division of the Alaska Department of Public Safety enforces the State regulations that

implement this plan in cooperation with the NMFS Enforcement Division and the U.S. Coast Guard.

5.4 Role of the Pacific Salmon Commission.

In March 1985, the United States and Canada signed a treaty concerning Pacific Salmon (the Pacific Salmon Treaty). The treaty governs Pacific salmon stocks that originate in the waters of the United States and Canada and (a) are subject to interception by the other party, (b) affect the management of the stocks of the other party, or (c) affect biologically the stocks of the other party. Thus, the Pacific Salmon Treaty governs most of the salmon stocks covered by this fishery management plan, and the Council must ensure that this plan is consistent with the treaty.

The treaty made several important changes to the way most Pacific Coast salmon fisheries are and will be managed and requires Canada and the United States to establish and enforce regulations to implement the provisions of the treaty, particularly the chapters for specific fisheries contained in Annex IV. Whenever appropriate, the Commission reviews these chapters and, upon the advice of its panels and other advisory groups, may amend them. The chapters of Annex IV of primary concern to the Council are those for (a) transboundary rivers, (b) chinook, (c) coho, and (d) a general obligation to prevent increased interceptions.

5.4.1 Transboundary Rivers

The chapter on transboundary rivers deals primarily with several rivers that originate in British Columbia and flow into Southeast Alaska (e.g, the Alsek, Stikine, and Taku). Of particular relevance to the Council are the chinook and coho stocks from the transboundary rivers. The chinook stocks have been reduced in abundance and are subject to a rebuilding plan contained in the chinook chapter, and the United States must provide Canada with the opportunity to harvest specified quotas of coho. Because chinook and coho are the primary targets of the fisheries managed by this plan, the Council must ensure that its management measures are consistent with the transboundary rivers provisions of the treaty.

5.4.2 Chinook Salmon

The chapter on chinook salmon ties in the chinook fisheries of Oregon, Washington, British Columbia, and Southeastern Alaska into one management regime. The basis of this chapter is a plan for controlling harvests of chinook salmon so that many natural chinook stocks, which declined to low levels of abundance during the late 1970s and early 1980s, can rebuild to levels of optimum production.

In essence, the chinook chapter requires the Council to coordinate its management to ensure that the decline in spawning escapements of depressed chinook stocks is halted, that the established spawning goals are attained by 1998, that fishing regimes do not affect unduly or concentrate disproportionately on stocks in need of conservation, that the effects of the incidental killing of chinook salmon in all fisheries (e.g. hook-and-release mortalities) are minimized, that the harvests do not exceed the quotas set by the Pacific Salmon Commission, and that at the end of the rebuilding schedule fishery management regimes maintain the stocks at optimum productivity and provide fair internal allocations.

5.4.3 Coho Salmon

Originally, the coho chapter was mainly concerned with coho stocks from Oregon, Washington, and southern British Columbia. Later, the coho stocks of northern British Columbia and Southeast Alaska also became important in Commission activities. For coho, this plan must, at least, be consistent with the general obligation that neither the United States nor Canada will initiate new intercepting fisheries nor conduct or redirect fisheries in a manner that intentionally increases interceptions of coho.

5.4.4 General Obligation

The General Obligation (chapter 7 of annex IV of the treaty) simply states: "With respect to intercepting fisheries not dealt with elsewhere in this Annex, unless otherwise agreed, neither Party shall initiate new intercepting fisheries, nor conduct or redirect fisheries in a manner that intentionally increases interceptions."

5.5 Role of the International North Pacific Fisheries Commission (INPFC) and the Convention For the High Seas Fisheries of the North Pacific Ocean

In 1952, Canada, Japan, and the United States signed the International Convention for the High Seas Fisheries of the North Pacific Ocean. This convention was designed to "ensure the

maximum sustained productivity of the fishery resources of the North Pacific Ocean . . . and . . . encourage the conservation of such resources." The convention applies to "all waters, other than territorial waters, of the North Pacific Ocean . . . and adjacent seas" (Article I). The convention also set up the International North Pacific Fisheries Commission to provide for scientific studies, exchanges of information, and a forum for discussions and decisions. In 1978, the convention was amended to account for the 200-mile fishing jurisdictions each of the three countries had established within the Convention area.

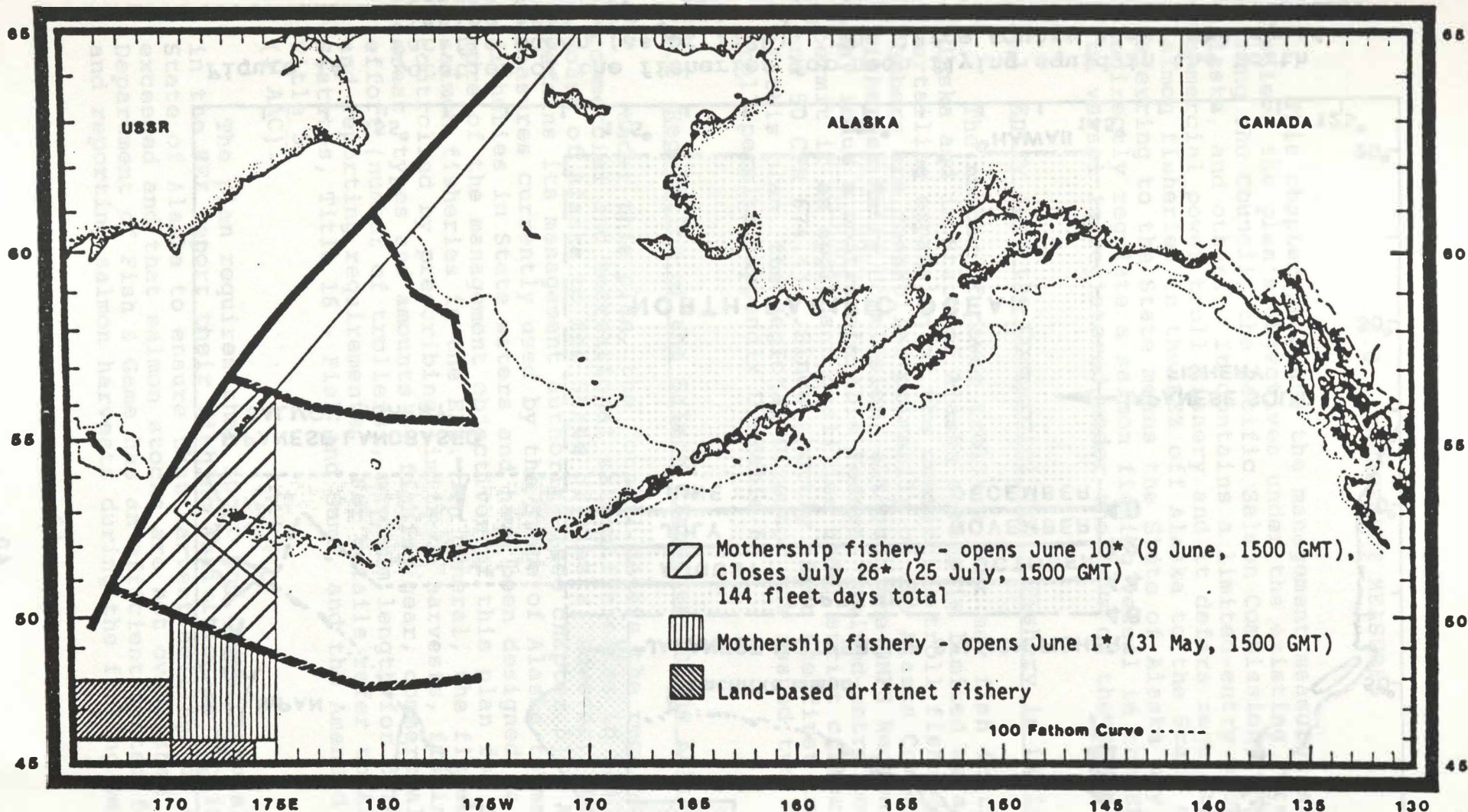
Under the convention (as amended), Japan agreed that (a) its mothership salmon gillnet fishery would abstain from fishing for salmon south of 56° North Latitude and east of 175° East Longitude in the North Pacific Ocean (b) agreed to limit the time and effort its mothership fishery would fish north of 56°N beyond the U.S. EEZ, (c) agreed to limit the time and effort its mothership fishery would fish in waters west of 175°E within the U.S. EEZ and between 175°E and 175°W north of 46°N, and (d) restricted its landbased salmon gillnet fishery to waters west of 175°E. Figure 14 shows where and when these fisheries are expected to operate in 1994 and later years.

Also, Japan agreed to restrict its high-seas gillnet fishery for neon flying squid (*Ommastrephes bartrami* (LeSueur)) to areas of the North Pacific Ocean where salmonids were unlikely to be present (Figure 15). Taiwan and the Republic of Korea agreed to similar restraints on their squid fisheries. In all, salmon may not be retained if caught in the squid fisheries.

Canada and the United States agreed to prohibit fishermen under their authority from fishing for salmon with nets in waters seaward of their territorial seas (which extend seaward 3 nautical miles from the coast), except for a few traditional nearshore fisheries that extended a bit seaward of 3 miles.

The United States Implemented the North Pacific Fisheries Act of 1954 to codify its role under the Convention (16 U.S.C. 1021 - 1035) and implemented a regulation to prohibit (with minor exceptions, see §2.2) net fishing for salmon in waters more than 3 nautical miles from shore (50 CFR 210).

In 1989, the United States began a series of meetings with the U.S.S.R. and other countries with the idea of replacing the U.S.-Japan-Canada INPFC with an organization consisting of all salmon-producing nations. More meetings are scheduled for 1990.



— U.S.-Russia Convention of 1867
 - - - - - Limit of U.S. Fisheries Conservation Zone
 * Japanese Standard Time (-9 GMT)

Prepared by:
 NMFS Office of Enforcement
 Juneau, Alaska
 June 1987

Figure 13. Map showing fishing areas for the Japanese high-seas salmon fishery in 1994 and following years, as governed by the International Convention for the High Seas Fisheries of the North Pacific Ocean.

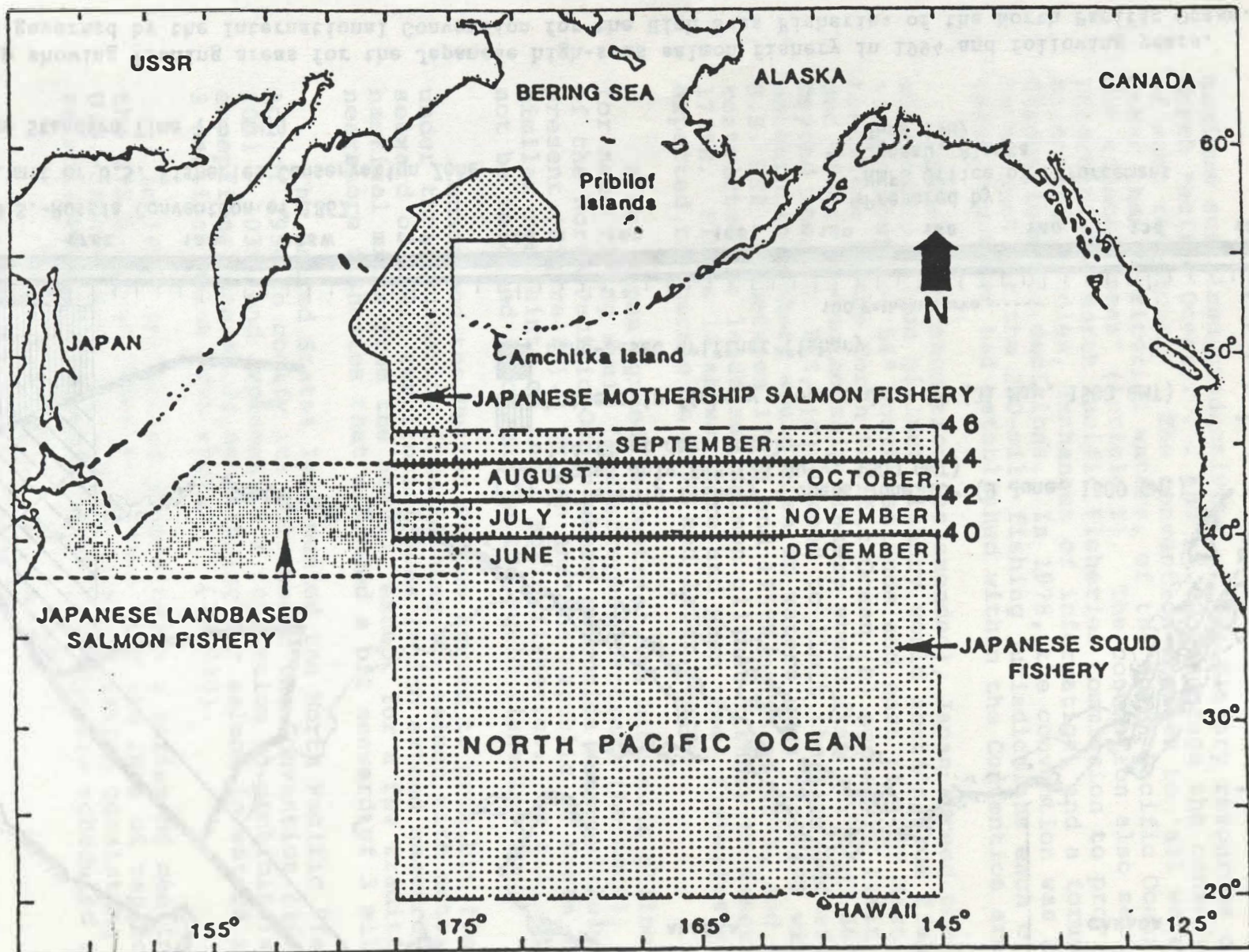


Figure 14. Location of the fisheries for neon flying squid in the North Pacific Ocean (as of 1988). The large square shows the squid fishing area for Japan and Taiwan and how the northern boundary changes by month. The squid fishery by the Republic of Korea operates within this area and to the west.

6.0 MANAGEMENT MEASURES

This chapter presents the management measures adopted to achieve the plan's objectives under the existing interactions among the Council, the Pacific Salmon Commission, the State of Alaska, and others. It contains a limited-entry program for the commercial power troll fishery and it defers regulations of the salmon fisheries in the EEZ off Alaska to the State of Alaska. Deferring to the State means the State of Alaska may directly or indirectly regulate a salmon fishing vessel in the EEZ as long as the vessel is registered under the laws of the State of Alaska.

6.1 Entry into the Commercial Troll Fishery is Limited.

The number of power trollers that may fish in the EEZ off Alaska and in State of Alaska waters is limited as a method of curtailing expansion of the commercial troll fishery. Those numbers are controlled primarily by the Alaska Commercial Fisheries Entry Commission, although the NMFS Regional Director may issue a nontransferable Federal limited-entry power-troll permit if an applicant qualifies under strict criteria (see §5.2 and 50 CFR 674.4). Since shortly after the first implementation of this plan, the Regional Director has issued two Federal power troll permits (Appendix D, Table 6).

6.2 Regulation of the Salmon Fisheries in the EEZ.

Under this plan, the Council defers the regulation of the commercial and recreational salmon fisheries in the EEZ off the coast of Alaska to the State of Alaska; however, the Council retains its management authority (see chapter 5). All of the measures currently used by the State of Alaska to manage salmon fisheries in State waters and have been designed to attain one or more of the management objectives of this plan for managing the salmon fisheries in the EEZ. In general, the fisheries are controlled by prescribing limits on harvests, fishing periods and areas, types and amounts of fishing gear, commercial fishing effort (number of trollers), minimum length for chinook salmon, and reporting requirements. For details refer to Alaska Statutes, Title 16 - Fish and Game, and the Amended Alaska Code, Title 5 (5 AAC).

The plan requires that sport and commercial salmon fishermen in the EEZ report their fishing activities as required by the State of Alaska to ensure that harvest ceilings or quotas are not exceeded and that salmon stocks are not overfished. The Alaska Department of Fish & Game has an efficient system for monitoring and reporting salmon harvests during the fishing periods, and

this system serves as the basis for inseason management of the salmon fisheries. Salmon harvested from the EEZ off Alaska or in State waters and landed outside Alaska must also be reported as required by the State of Alaska.

Under this arrangement, the Council finds no reason for the Secretary to collect any data on the fishery, nor does it find any reason the State of Alaska should submit any report to the Secretary. The Council will rely on periodical verbal reports from its salmon plan team and the annual written stock assessment and fishery evaluation (SAFE) report to keep it apprised on the status of the salmon fisheries.

7.0 ENFORCEMENT

Enforcement of Federal fishing regulations for fisheries in the EEZ off Alaska is primarily the responsibility of the Enforcement Division, National Marine Fisheries Service, and the U.S. Coast Guard. Enforcement of State of Alaska fishing regulations is primarily the responsibility of the Fish and Wildlife Protection Division of the Alaska Department of Public Safety. Many agents are deputized and can enforce both sets of regulations.

8.0 OTHER ITEMS

8.1 Costs likely to be incurred in Managing the Fishery.

The costs of managing the salmon fisheries in the EEZ under this plan can reasonably be discussed only in relative terms. For the past several years, the annual cost of managing the fishery probably amounts to less than the equivalent of one employee-year. That total includes the effort of the Council and Council staff, NMFS Alaska Region staff (including NMFS enforcement staff), NOAA Regional Counsel staff, ADF&G staff, NMFS Headquarters staff, NOAA and other Department of Commerce Staff, and the cost of publishing regulations in the FEDERAL REGISTER.

With the regulation of the salmon fisheries in the EEZ being deferred to the State of Alaska, the overall costs of managing the fishery should decrease slightly from past levels. Costs to the State will probably decrease slightly because Alaska Department of Fish and Game personnel will not have to coordinate as closely with the National Marine Fisheries Service on inseason adjustments of fishing times and areas (for example, as in the joint issuance of Emergency Orders).

Costs to the Federal Government (Council, Department of Commerce, Office of the Federal Register) will decrease because of its less active involvement in managing and regulating the fisheries. The greatest savings no doubt will come from not having to prepare, approve, and publish Federal regulations in the FEDERAL REGISTER. In 1988, for example, the 8 separate notices were printed on 16 pages and accounted for 30 columns of text in the FEDERAL REGISTER.

8.2. Actual and Potential Revenues from the Fishery.

The actual and potential revenues from the sport and commercial troll fisheries for salmon in the EEZ off the coast of Alaska are impossible to estimate because both fisheries operate as if the EEZ and State waters were one. No data are available to separate the fishing effort, costs, and benefits of the salmon fisheries in the EEZ from those in State waters.

The salmon sport fishery is almost nonexistent in the EEZ off Alaska and there is no reason for it to expand. Salmon are generally abundant enough within State waters to satisfy sport fishing needs, and there is no evidence that sport fishing success would improve if the sport fishermen went farther offshore. Thus, individual sport fishermen as well as the sport charter boats will probably continue to do most, if not all, of their fishing within the protected internal or nearshore State

waters. The overall revenues from the Alaskan salmon sport fishery, however, will probably increase slowly for some time into the future as the number of residents increase and tourists continue to come to Alaska to sport fish. The sport charter business in Alaska is still in its early years and will probably grow for some more years. Accordingly, the revenues from sport fishing will increase, and likely they will do so at the cost of decreased revenues to the commercial fisheries.

The ex-vessel value (prices paid to the fishermen) of the troll harvests (in the EEZ and State waters combined) from 1976 through 1985 are listed in Appendix D, Table 4. The total ex-vessel value of the Alaska troll salmon harvest averaged \$19,838 thousand from 1976 through 1985, with a peak of \$26,570 thousand in 1984.

If the fishery remains under the present limited-entry system, the Pacific Salmon Commission continues to set limits on the harvest of chinook, the Alaska Board of Fisheries continues its present policies on allocations, and the stocks of salmon produce average numbers of salmon, then it is unlikely that the future harvests by the Alaska troll fishery will vary much from the recent average in terms of number or pounds of salmon.

The ex-vessel price determines what revenues are earned from the sale of those salmon. The price of troll-caught salmon varies considerably from year to year (Appendix D, Table 5). The prices for troll-caught chinook and coho salmon landed in Alaska depend to a large extent on the amount of troll-caught chinook and coho landed elsewhere, the overall harvests of chinook and coho and other species of salmon (particularly sockeye), the supply of salmon in cold storage, and the supply of fresh Pacific and Atlantic salmon from domestic and foreign fish farms. Many fishermen and others perceive pen-farmed salmon as a major threat to the price and demand for Alaska troll-caught chinook and coho salmon.

The troll harvest of chinook salmon is expected to increase somewhat as the depressed chinook salmon runs are rebuilt under provisions of the Pacific Salmon Treaty. That increased harvest will result in increased revenues to the troll fleet. The greatest potential for some increase in harvests and revenues, however, is from the expected increased production of chinook salmon from Alaska's salmon hatcheries.

Eventually, however, the Alaska Board of Fisheries might decrease its allocations of salmon to the troll fleet as the sport fishery grows and becomes more important; if so, the harvests by and revenues to the troll fleet will decrease.

9.0 REVIEW AND APPEAL OF STATE REGULATIONS

This plan provides for reviews of State regulations by the Secretary of Commerce and allows any member of the public to appeal a State statute or any regulation issued by State for the salmon fisheries in the EEZ off the coast of Alaska. This section presents the policy and procedures for those reviews and appeals.

9.1. Annual and Perennial Regulations

As soon as this plan is approved, any member of the public may appeal to the State of Alaska any existing State of Alaska salmon fishing regulation relating to the salmon fisheries in the EEZ off the coast of Alaska. If unsuccessful after having exhausted all legal procedures within the State, he may then appeal to the Secretary of Commerce according to the procedures set out in this chapter. Also, any person may appeal any Alaska Statute affecting salmon fishing regulations to the Secretary using the same procedures.

Secretarial review of appeals is limited to whether the challenged State statute or regulation is consistent with this fishery management plan, the Magnuson Act, and other applicable Federal law. The Secretary will not respond to comments that merely object to a State statute or regulation or state that an alternate State statute or regulation would provide for better management of the salmon fishery unless the person making the appeal ties the objection to the appropriate standard of review (consistency with the plan, Magnuson Act, or other applicable Federal law). This provision will allow the Secretary to disregard frivolous comments and will encourage persons with serious concerns to participate fully in the State procedures before seeking Secretarial intervention. Nothing in this plan is intended to limit a person with a serious concern any opportunity to seek judicial review of State regulations under the State Administrative Procedure Act (AS §44.62).

Under the State Administrative Procedure Act, a concerned person may petition the Alaska Board of Fisheries for the adoption or repeal of a regulation as long as the petition results in a finding of an emergency affecting the immediate preservation of the public peace, health, safety, or general welfare.

The Board recognizes the importance of public participation in developing fishery management measures and regulations, and finds that in most cases petitions detrimentally circumvent its normal public participation process. The Board believes an adequate and more reasonable opportunity for public

participation is provided by its regularly scheduled meetings. It recognizes that public reliance on the predictability of normal Board activities is a critical element in the regulatory process.

Accordingly, the Board prefers that a concerned person propose changes to fishery regulations for the Board to consider at its regularly scheduled meetings, rather than petition it. Currently, the Board meets every year to review and act on how fisheries are managed. Because of the number of proposals the Board has received in the past (as many as 600 per meeting), it probably will not consider all types of issues or fisheries at each meeting.

The proposals received by the Board are bound and mailed to 74 fish and game advisory committees, 6 regional fish and game councils, and more than 500 other interested individuals and organizations. In addition, copies of the proposals are available at local Alaska Department of Fish and Game offices. The Council and the Alaska Region of NMFS receive copies of the proposals for review.

Following review of the proposals by the advisory committees and other members of the public, the Board convenes public meetings to receive reports and comments from ADF&G, advisory committees, and the public, and then it votes in public sessions on the proposed changes to the regulations. The public has come to rely on this regularly scheduled participatory process.

Representatives of the Council, NMFS, and the NOAA's Office of General Counsel have the opportunity to submit proposals and comments to the Board, and can advise the Board, as needed or as requested by the Board, about the extent to which proposed regulations fall within the scope of this fishery management plan, the Magnuson Act, and other applicable Federal law. None of these representatives, however, will vote on the various proposals.

Further, NMFS will review the management measures adopted by the Board for consistency with this fishery management plan, the Magnuson Act, and other applicable Federal law. The Secretary will consider comments submitted by the Council on any regulation adopted by the State during the 20 days after the end of the Board meeting. The Secretary may hold an informal hearing, if time permits, to gather further information concerning the regulations under review. The Secretary, however, will consider only comments on whether the new regulations are consistent with this plan, the Magnuson Act, and other applicable Federal law.

If the Secretary makes a preliminary determination that a regulation adopted by the State is inconsistent with this plan, the Magnuson Act, or other applicable Federal law (on the basis

of the Secretarial review of the adopted regulations or the review of comments received, or as a result of an appeal of an adverse decision in the State appeal process), then the Secretary will do the following:

(a) publish a proposed rule in the FEDERAL REGISTER for the salmon fisheries in the EEZ that is consistent with this plan, the Magnuson Act, and other applicable Federal law, together with the reasons for the rule, and request comments for 30 days, and

(b) provide actual notice of the proposed rule to the Council and the Commissioner of the Alaska Department of Fish and Game. The State will have 20 days to request an informal hearing.

If, after reviewing public comments and any information obtained in an informal hearing, the Secretary decides that the State regulations in question are consistent with this plan, the Magnuson Act, and other applicable Federal law, then the Secretary will publish in the FEDERAL REGISTER a withdrawal of the proposed rule and so notify the State and the Council.

If the State withdraws the regulation in question or states in writing that it will not implement it, the Secretary will publish in the FEDERAL REGISTER a withdrawal of the proposed Federal rule. The State may choose to withdraw its regulations as a result of its own appeals procedure or because of the review procedure set up in this fishery management plan.

If the Secretary decides, after reviewing public comments and any information obtained in an informal hearing, that the State regulations in question are inconsistent with this plan, the Magnuson Act, or other applicable Federal law, the Secretary will publish in the FEDERAL REGISTER a final rule that supersedes the State regulation for the fisheries in the EEZ. Such rules are Federal regulations and, as such, will comply with Federal rulemaking procedures and be enforced as Federal law.

If, by following the procedures described in this section, a necessary Federal rule can not be effected when needed, the Secretary will expedite the process. In doing so, the Secretary will notify the Council and the Commissioner of the Alaska Department of Fish and Game that he will expedite the review procedure (possibly deleting the requirement for an initial appeal to the State) and explain what the procedure will be. In the expedited review, the Secretary, if at all possible, will provide opportunity for comment by the Council (or a committee of the Council) and the Commissioner of the Alaska Department of Fish and Game. If necessary, however, the Secretary can immediately publish in the FEDERAL REGISTER an interim final rule that supersedes in the EEZ any State regulation that the Secretary finds is inconsistent with this plan, the Magnuson Act

or other applicable Federal law; the interim final rule will include a request for comments.

9.2 Review and Appeal of State Inseason Management Actions.

If a person believes that a State inseason management action is inconsistent with this plan, the Magnuson Act, or other applicable Federal law, that person may appeal the action with the Secretary. The concerned person must submit in writing to the Secretary a description of the action and the reasons he believes it is inconsistent with the plan, the Magnuson Act, or other applicable Federal law, and he must submit the appeal within 10 days of the State's issuance of the action.

The Secretary will consider only appeals that the State inseason management action is inconsistent with this plan, the Magnuson Act, or other applicable Federal law. The Secretary will not consider appeals that merely state that the appellant does not like the inseason management action or prefers another; the appellant must present those concerns to the State.

Upon receipt of the appeal, the Secretary will immediately provide a copy to the Council and to the Commissioner of the Alaska Department of Fish and Game. The Secretary will, to the extent possible when reviewing the appeal, communicate with the Commissioner of the Alaska Department of Fish and Game and consider his comments on the issue. If time permits, the Secretary will allow 5 days for comment on the appeal. If the Secretary determines that there is insufficient time available for this review, he will seek comments by telephone from the Commissioner and the Council.

Alaska salmon fishing regulations grant certain rights to appeal inseason management measures. A concerned person may wish to pursue the State appeal procedures along with the Federal procedures described here.

If, after review of the appeal and any comments from the Commissioner of the Alaska Department of Fish and Game and the Council, the Secretary determines that the challenged action is consistent with this plan, the Magnuson Act, and other applicable Federal law, he will so notify the appellant, the Commissioner, and the Council.

However, if the Secretary finds the inseason action is inconsistent and for good cause he must immediately issue Federal regulations that supersede State regulations for the salmon fisheries in the EEZ, then he will publish in the FEDERAL REGISTER the necessary interim final Federal rule and request comments on the rule.

If he decides that Federal regulations to supersede the State regulation for the salmon fisheries in the EEZ need not be implemented immediately, he will follow the procedures discussed in §9.1. That is, he will publish a proposed rule in the FEDERAL REGISTER and request comments, provide the State with an opportunity for an informal adjudicatory hearing, and then either withdraw the proposed rule or publish a final rule that supersedes the State regulation for the salmon fisheries in the EEZ. This Federal rulemaking would comply with Federal rulemaking procedures.

APPENDIX 1. 10. REFERENCES CITED FOR SALMON FMP.

Alaska Department of Fish and Game.

1990. Finfish Report to the Board of Fisheries. Regional
Coast Information Report No 1J90-02. 227 p.

North Pacific Fishery Management Council.

1978. Fishery Management Plan and Environmental Impact
Statement for the High Seas Salmon Fishery off the
Coast of Alaska East of 175 Degrees East Longitude.
vi + 149 p.

1989. Discussion of the Need for and the Issues of the
Revision (Third Amendment) of the Fishery Management
Plan for the High-Seas Salmon off the Coast of
Alaska. ii + 30 p.

3. Amendment 1 of the FMP (See p. 58 for provisions).

Adopted by the Council at its March 1980 meeting, this
amendment made 11 changes to the FMP (see attachment 1 for
details). On 3 MAY 80, the Assistant Administrator approved all
but the proposal to ban beam trawling. The amendment was
implemented by emergency regulations on 13 MAY 80, and by final
regulations on 3 SEP 80.

4. Amendment 2 of the FMP (See p. 59 for provisions).

Adopted by the Council at its March 1981 meeting, this
amendment made five changes to the FMP (see attachment 2 for
details). On 3 JUN 81, the Assistant Administrator approved the
amendment. It was implemented by emergency interim regulations
on 18 JUN 81, and--all but a provision regarding fisheries to
report the catches they landed outside Alaska--was implemented by
final regulations on 13 NOV 81.

5. Management of the High Seas Salmon Fisheries Since 1981.

Since 1981, the High Seas Salmon Fisheries (i.e., the
commercial troll fisheries of S.E. Alaska) have been controlled
under the FMP by the NMFS Alaska Region working with the Alaska
Department of Fish and Game and publishing opening and closing
dates in the FEDERAL REGISTER.

APPENDIX A. BRIEF HISTORY OF THE HIGH-SEAS SALMON FMP.

1. The 1978 Draft FMP for the Commercial Troll Fisheries off the Coast of Alaska.

The Council withdrew this draft after review by the NMFS Washington, D.C., office and replaced it with the 1979 FMP.

2. The 1979 FMP for the High Seas Salmon Fisheries off the Coast of Alaska East of 175 Degrees East Longitude.

The FMP was adopted by the Council on 1 DEC 1978. It was approved (except for a provision to prohibit hand trolling) by the NOAA Assistant Administrator for Fisheries on 30 APR 79, implemented by interim emergency regulations on 15 MAY 79, and by final regulations on 30 AUG 79.

3. Amendment 1 of the FMP (See p. 58 for provisions).

Adopted by the Council at its March 1980 meeting, this amendment made 11 changes to the FMP (see attachment 1 for details). On 2 MAY 80, the Assistant Administrator approved all but the proposal to ban hand trolling. The amendment was implemented by emergency regulations on 15 MAY 80, and by final regulations on 3 SEP 80.

4. Amendment 2 of the FMP (See p. 59 for provisions).

Adopted by the Council at its March 1981 meeting, this amendment made five changes to the FMP (see attachment 2 for details). On 3 JUN 81, the Assistant Administrator approved the amendment. It was implemented by emergency interim regulations on 3 JUN 81, and--all but a provision requiring fishermen to report the catches they landed outside Alaska--was implemented by final regulations on 19 NOV 81.

5. Management of the High Seas Salmon Fisheries Since 1981.

Since 1981, the high seas salmon fisheries (i.e., the commercial troll fisheries of S.E. Alaska) have been controlled under the FMP by the NMFS Alaska Region working with the Alaska Department of Fish and Game and publishing opening and closing notices in the FEDERAL REGISTER.

PROVISIONS OF AMENDMENT 1.

1. Extended the plan through 14 April 1981.
2. Allowed entry into the troll fishery in the FCZ only by those holders of valid State of Alaska limited entry permits for the power troll fishery as of 14 May 1979. (This provision did two things: it continued the moratorium on the entry of power trollers, and it banned hand trolling in the FCZ. The ban on hand trolling, however, was disapproved by the Secretary of Commerce.)
3. Provided for transfer of those permits under Alaska Law with oversight and review by the Department of Commerce.
4. Strengthened the inseason management philosophy expounded in the plan and provided for an area-wide closure for 10 days beginning approximately 10 July unless inseason assessments indicated that the coho salmon run was considerably stronger than usual or had moved inshore prior to that date.
5. Required that all troll-caught chinook and coho salmon be landed with their heads attached to their bodies.
6. Restricted trollers to no more than four lines in the area south of the latitude of Cape Spencer and no more than six lines north of that line.
7. Allowed no more than six gurdies aboard any licensed trolling vessel.
8. Proposed to redefine regulatory areas 154, 157, and 189 (Note: This proposal was never carried out).

2.1. Original Management Objectives

PROVISIONS OF AMENDMENT 2.

1. Modified the objectives of the plan.
2. Reduced the acceptable biological catch and optimum yield ranges for chinook salmon in the Eastern Area by 15 percent to a new range of 243,000 to 272,000 chinook and treated the upper limit of the range as a harvest ceiling.
3. Established the chinook, chum, pink, and sockeye salmon trolling season from 15 May through 20 September.
4. Restricted hand trollers fishing in the FCZ to a maximum of two lines and gurdies or four sport poles.
5. Required fishermen intending to sell their catch outside of Alaska to submit an Alaska Department of Fish and Game fish sales ticket or equivalent information at an Alaskan port prior to leaving Alaskan waters. (Note: this provision needs to be reimplemented with Federal Regulations; it was disapproved by the Office of Management and Budget.)
6. Required fishermen to land all fin-clipped chinook and coho salmon with their heads attached to their bodies. (This provision modified a part of Amendment 1 that required all troll-caught chinook and coho salmon to be landed with their heads on.)
7. Banned the possession of treble hooks while fishing in the FCZ. (Note: This provision was rescinded in 1983.)

APPENDIX B. OBJECTIVES OF THE HIGH-SEAS SALMON FMP.

B.1. Original Management Objectives

- (a). Control the expansion of the salmon troll fishery in the Fishery Conservation Zone.
- (b). Allocate the salmon resource among user groups without disrupting present social and economic structures.
- (c). Regulate the catch of salmon to assure adequate escapement for spawning.
- (d). Reduce the catch of salmon with potential growth to increase the poundage yield from the troll fishery.
- (e). Make cost effective the public investment in the high seas salmon fishery.
- (f). Promote the eventual development of a Pacific Coast salmon fishery management plan.

B.2. Current Management Objectives (Amendment 2).

- (a). Manage the troll fishery in conjunction with other Southeast Alaska salmon fisheries to obtain the number and distribution of spawning fish capable of producing the optimum total harvest on a sustained basis from all wild salmon stocks harvested in Southeast Alaska.
- (b). Allocate the optimum yield to the various Southeast Alaska user groups as directed by the Alaska Board of Fisheries and North Pacific Fishery Management Council.
- (c). Decrease directed and incidental harvest of smaller, immature fish and reduce sublegal chinook hook/release mortalities where possible, consistent with allocation decisions and with the objective of maximizing benefits to user groups.
- (d). Control and reverse recent trends of expanding effort and catch in outer coastal and offshore Southeast Alaskan waters to accomplish conservation goals.
- (e). Develop fishery management techniques which will allow full utilization of salmon returning to supplemental production systems while providing necessary protection for intermingling natural runs which must be harvested at lower rates.
- (f). Work toward the development of an integrated coastwide management plan for chinook salmon.

Appendix C. Historical Net Fishing Areas in the EEZ off Alaska.

In 1953, the United States, Canada, and Japan created the International Convention for the High Seas Fisheries of the North Pacific Ocean. The convention was signed in Tokyo on 9 May 1952 and entered into force on 12 June 1953. Among other things, the convention was written "to ensure the maximum sustained productivity of the fishery resources of the North Pacific Ocean, and . . . to encourage the conservation of such resources. . ." (introduction, paragraph 3). The convention defined "the Convention area" as "all waters, other than territorial waters, of the North Pacific Ocean which for the purposes hereof shall include the adjacent seas" (Article I, paragraph 1).

Congress passed the North Pacific Fisheries Act of 1954 (16 USC §§1021-1035) to implement the convention. This act (as amended) provides, among other things, that the Secretary of Commerce "may adopt regulations which apply only to stocks of fish in the Convention area north of the parallel of 48 degrees and 30 minutes . . ." (16 USC 1025(c)).

Regulations implementing the act prohibit vessels of the United States from fishing for salmon with nets in the North Pacific area (50 CFR 210.10). For the purposes of this regulation, the North Pacific Area is defined "to include all waters of the North Pacific Ocean and Bering Sea north of 48° 30' north latitude, exclusive of waters adjacent to Alaska north and west of the International Boundary at Dixon Entrance . . ." 50 CFR 210.1(a). The regulations define the "exclusive waters adjacent to Alaska" as "those in which salmon net fishing is permitted under State of Alaska regulations. Federal salmon net fishing regulations in exclusive waters outside of State waters shall be the same as regulations promulgated by the State of Alaska for its citizens" (50 CFR 210.1(b)).

Thus, net fishing for salmon is permitted in three historical fishing areas in the EEZ off the coast of Alaska: in Cook Inlet, near the mouth of the Copper River, and near False Pass. The next paragraphs contain specific descriptions of these areas and the areas are depicted in Figures C1, C2, and C3. The descriptions are extracted from Alaska Board of Fisheries regulations.

1. Cook Inlet

5 AAC 21.100. **DESCRIPTION OF AREA.** The Cook Inlet Area includes all waters of Alaska enclosed by a line extending east from Cape Douglas (58°52' N. lat.), and a line extending south from Cape Fairfield (148°50' long.).

5 AAC 21.100. **FISHING DISTRICTS, SUBDISTRICTS AND SECTIONS.**

(a) Northern District: north of a line extending from Boulder Point at 60°46'23" N. lat., to Shell Platform C, then to a point on the west shore at 60°46'23" N. lat.;

(b) Central District: between a line extending from Boulder Point at 60°46'23" N. lat., to Shell Platform C, then to a point on the ~~west shore~~ at 60°46'23" N. lat., and the latitude of Anchor Point light.

(c) Southern District: all waters enclosed by a line from the westernmost tip of Anchor Point west to 59°46'15" N. lat., 152°20' W. long., then south to 59°03'25" N. lat., 152°20' W. long., then in a northeasterly direction to the tip of Cape Elizabeth, then from the tip of Cape Elizabeth to the tip of Point Adam.

(d) Kamishak Bay District: all waters enclosed by a line from 59°46'15" N. lat., 153°30' W. long., then east to 59°46'15" N. lat., 152°20' W. long., then south to 59°03'25" N. lat., 152°20' W. long., then southwesterly to Cape Douglas (58°52' N. lat.).

2. Prince William Sound Area

5 AAC 24.100. **DESCRIPTION OF AREA.** The Prince William Sound Area includes all waters of Alaska between Cape Fairfield and Cape Suckling.

5 AAC 24.200. **FISHING DISTRICTS, SUBDISTRICTS AND SECTIONS.**

(a) Copper River District: all waters of Hinchinbrook Island between the tip of Hook Point and Boswell Rock including Boswell Bay waters south of a line from Boswell Rock to the radio tower at Whitshed Village, and waters between Whitshed Village and west of a line from a point on the mainland at 60°10'15" N. lat., 144°35'27" W. long. to the northernmost tip of Fox Island and then extending south from fox Island along 144°36' W. long.

(b) Bering River District: all waters west of the longitude of Cape Suckling (143°53' W. long.) and east of a line from a point on the mainland at 60°10'15" N. lat., 144°35'27" W. long.,

to the northernmost tip of Fox Island and then extending south from Fox Island along 144°36'W. long.

5 AAC 24.301. SEAWARD BOUNDARY OF DISTRICTS. For the purpose of managing the historical salmon net fishery in the vicinity of the Copper River and Bering River, the outer boundary of the Copper River and Bering Districts is a line three miles seaward from a line from Cape Suckling (143°53' W. long.) to the southernmost tip of Pinnacle Rock to the tip of Hook Point on Hinchinbrook Island.

3. Alaska Peninsula Area.

5 AAC 09.100. DESCRIPTION OF AREA. The Alaska Peninsula Area includes all waters of Alaska from Cape Meshinkof to Cape Sarichef Light and from a line extending from Scotch Cap through the easternmost tip of Ugamak Island to a line extending 135° southeast from Kupreanof Point.

5 AAC 09.200. FISHING DISTRICTS AND SECTIONS.

(C) The Unimak Districts includes all waters on the south side of Unimak Island between a line extending from Scotch Cap (54°24'N. lat., 164°47'36" W. long.) through the easternmost tip of Ugamak Island (54°12'42" N. lat., 164°45'48" W. long.), and a line extending 115° from Cape Pankof Light (54°39'36" N. lat., 163°03'36" W. long), including the Sanak Islands.

(d) Southwestern District: all waters on the south side of the Alaska Peninsula north and east of a line extending 115° from Pankof Light (54°39'36" N. lat., 163°03'36" W. long) and west of a line extending 106° from Arch Point Light (55°12'20" N. lat., 161°54'15" W. long.) to the western boundary of the Southeastern District (longitude of McGinty Point: 160°59' W. long.), including Inner Iliasik, Outer Iliasik, Goloi, Dolgoi, Poperechoi, and Deer Islands, all waters of Ikaton Bay, and all waters of Isanotski Strait south of a line from the False Pass cannery dock (54°51'30" N. lat, 163°24'30" W. long.) to Nichols Point (54°51'30" N. lat, 163°23'10" W. long).

5 AAC 09.301. SEAWARD BOUNDARY OF DISTRICTS. For the purpose of managing the historical salmon net fishery in the vicinity of False Pass and Unimak Bight, the outer boundary of the Southwestern and Unimak Districts is a line three miles seaward from a line commencing at 54°26'45" N. lat., 162°53' W. long., near the western end of Sanak Island to Cape Lutke on Unimak Island.

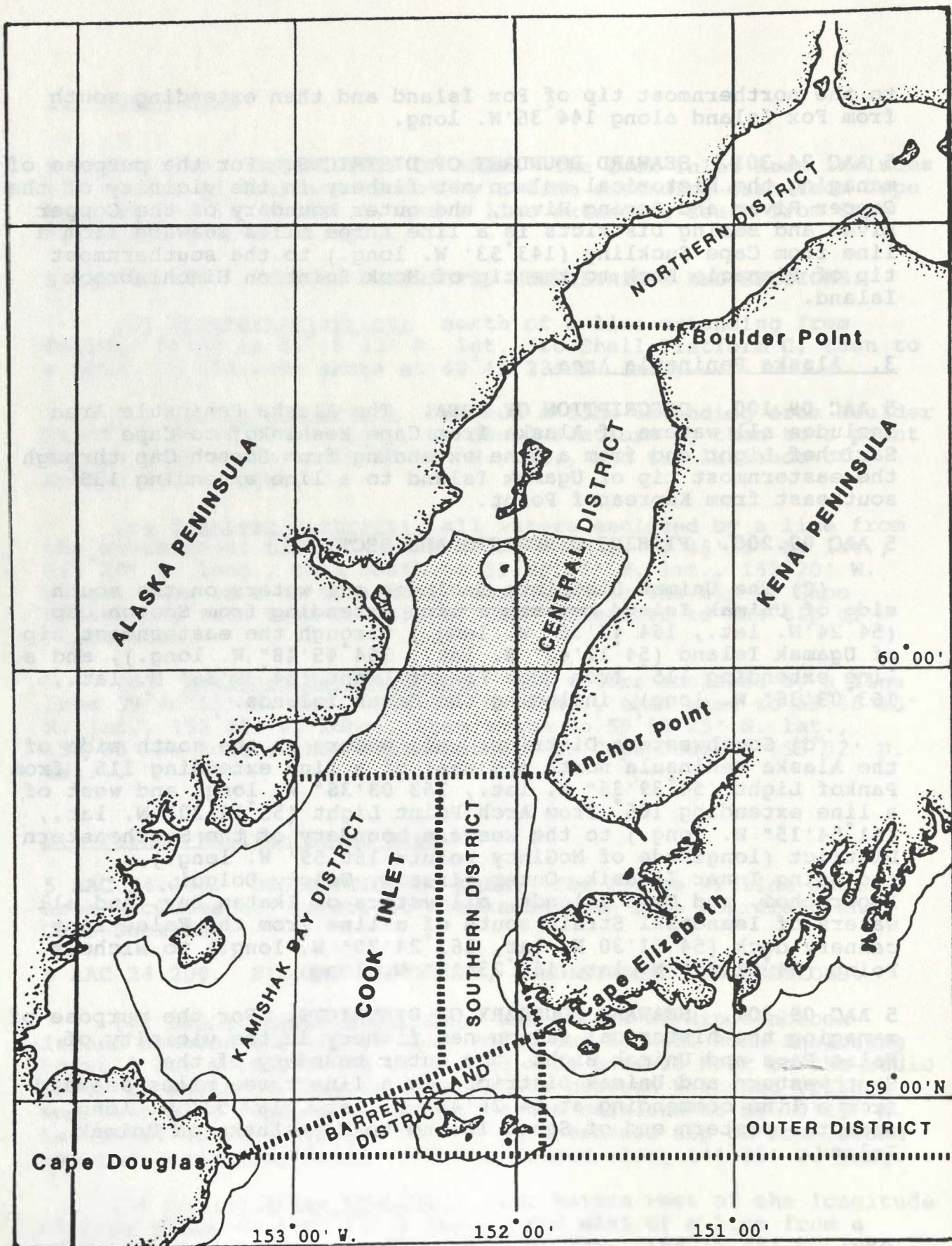


Figure C.1. Location of the historical net-fishing area in the Cook Inlet area (shaded). The hatched lines separate ADF&G fishing districts.

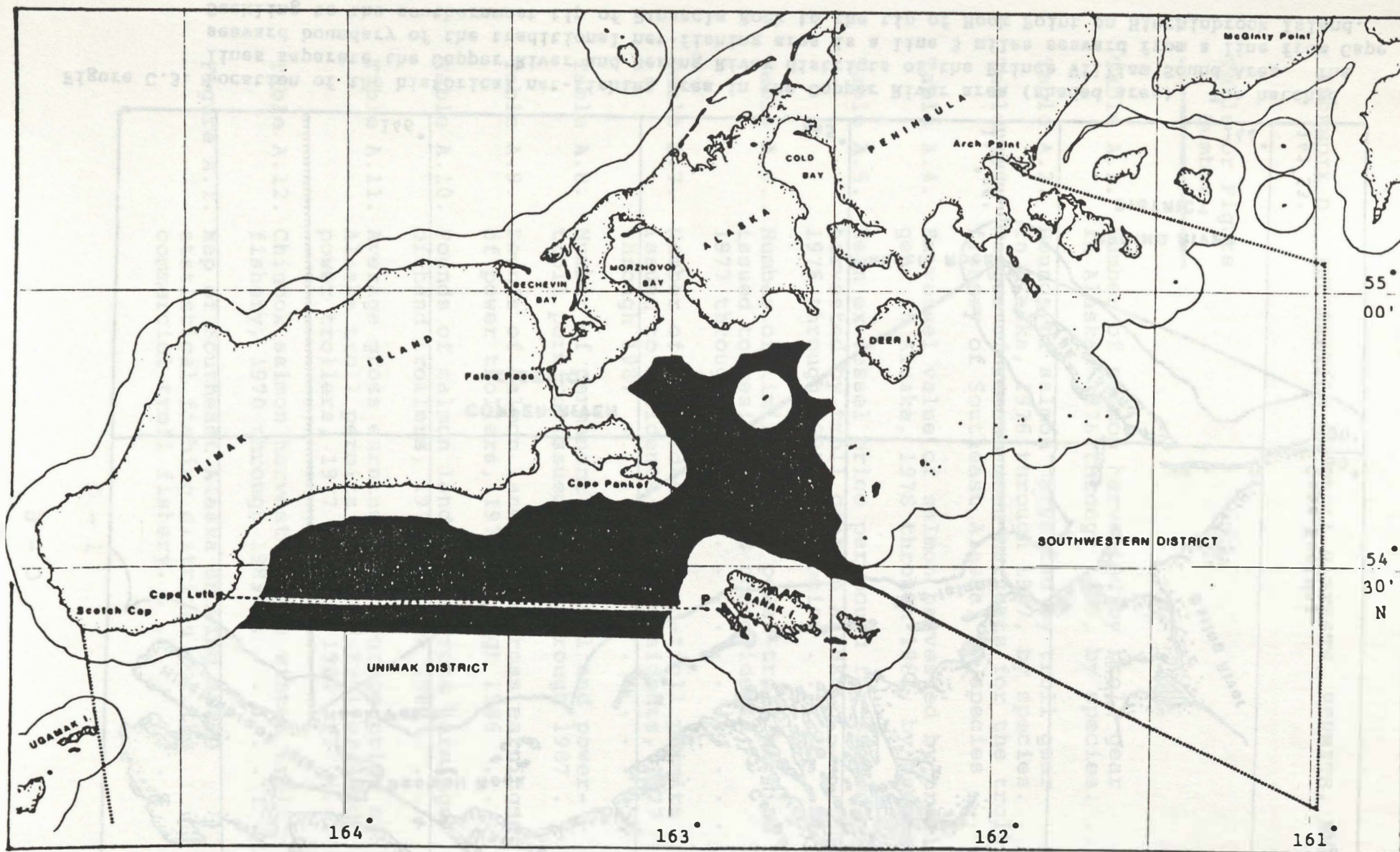


Figure C.2. Location of the historical net-fishing area in the False Pass area (shaded area). The hatched lines separate the Unimak and Southwestern Districts of the Alaska Peninsula Area. The seaward boundary of the traditional net-fishing area is a line 3 miles seaward of the dashed line running between Cape Lutke and point P on the west side of Sanak Island at $54^{\circ}26'45''$ N. lat., $162^{\circ}53'$ W. long. (5 AAC 09.301).

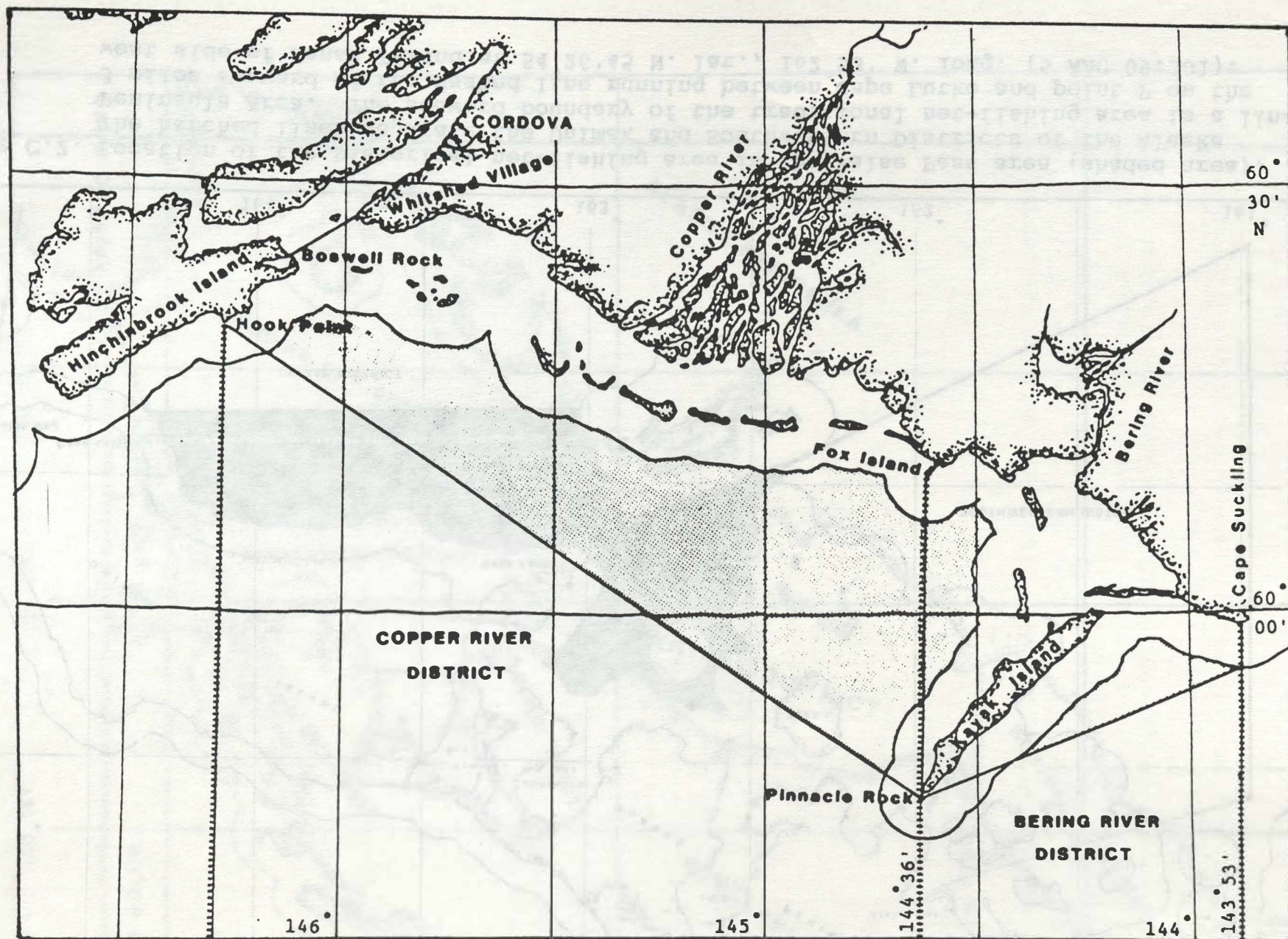


Figure C.3. Location of the historical net-fishing area in the Copper River area (shaded area). The hatched lines separate the Copper River and Bering River districts of the Prince William Sound Area. The seaward boundary of the traditional net-fishing area is a line 3 miles seaward from a line from Cape Suckling to the southernmost tip of Pinnacle Rock to the tip of Hook Point on Hinchinbrook Island.

APPENDIX D. INFORMATION ON TROLL HARVESTS, PERMITS, AND VALUES

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Table A.17. Troll harvests of pink salmon from the EEZ off Alaska, 1978 through 1989 D - 20

Table A.1. Number of Salmon Harvested by Troll Gear in Alaska, 1976 Through 1989, by Species.^a

Year	Thousands of Salmon					Total
	Chinook	Coho	Pink	Sockeye	Chum	
1976	232	525	193	1	5	956
1977	271	507	281	6	12	1,077
1978	375	1,101	618	3	26	2,123
1979	338	919	629	7	25	1,918
1980	302	707	268	3	12	1,292
1981 ^b	252	862	577	7	9	1,707
1982	250	1,322	503	2	6	2,083
1983	273	1,280	499	8	21	2,081
1984	236	1,132	573	11	28	1,980
1985 ^c	219	1,603	969	8	53	2,852
1986	239	2,137	182	7	51	2,616
1987	269	1,141	487	10	13	1,920
1988	232	500	507	9	86	1,334
1989	225	876	1558	17	36	2,712
<u>Means^d</u>						
1976-84	281	928	460	5	16	1,691
1985-88	237	1,251	741	10	48	2,287
1976-88	265	1,044	560	7	27	1,904

^aSource of data: ADF&G, Commercial Fisheries Division, Region 1, Lotus 123 tables.

^bIn 1981, the Alaska Board of Fisheries and the North Pacific Fishery Management Council lowered the level of allowable harvest of chinook salmon by all commercial fisheries in Southeastern Alaska to a range of 243,100 to 272,000 chinook salmon.

^cBeginning in 1985, the Pacific Salmon Treaty imposed a quota on the harvest of chinook salmon by all fisheries in Southeast Alaska.

^dThe period 1976-1984 was before the Pacific Salmon Treaty; the period 1985-1987 was after the treaty went into effect.

Table A.2. Pounds of Salmon Harvested by Troll Gear in Alaska
1976 Through 1987, by Species.^a

Year	Thousands of Pounds of Salmon					Total
	Chinook	Coho	Pink	Sockeye	Chum	
1976	2,965	3,676	720	8	42	7,411
1977	3,980	4,163	1,195	37	97	9,472
1978	5,785	6,854	1,872	17	203	14,731
1979	5,143	6,050	2,274	40	189	13,696
1980	4,822	4,605	934	17	93	10,471
1981 ^b	4,124	6,149	2,287	44	74	12,678
1982	4,005	9,145	1,439	14	47	14,650
1983	4,344	8,573	1,443	46	150	14,556
1984	3,842	9,169	1,775	55	208	15,049
1985 ^c	3,493	11,614	2,716	43	386	18,252
1986	3,739	14,093	391	40	375	18,638
1987	3,787	6,838	2,120	53	92	12,890
1988 ^d	3,668	3,528	1,162	46	591	8,995
Means^e						
1976-84	4,334	6,487	1,549	31	123	12,524
1985-88	3,672	9,018	1,597	46	361	16,694
1976-88	4,131	7,266	1,564	35	196	13,191

^aSource: For years 1976 - 1985, ADF&G annual statistical leaflets on Alaska Catch and Production; for 1986 - 1988, ADF&G Commercial Fisheries Division, annual preliminary reviews of the Alaska commercial salmon fisheries.

^bIn 1981, the Alaska Board of Fisheries and the North Pacific Fishery Management Council lowered the level of allowable harvest of chinook salmon by all commercial fisheries in Southeastern Alaska to a range of 243,100 to 272,000 chinook salmon.

^cBeginning in 1985, the Pacific Salmon Treaty imposed a quota on the harvest of chinook salmon by all fisheries in Southeast Alaska.

^dThe period 1976-1984 was before the Pacific Salmon Treaty; the period 1985-1987 was after the treaty went into effect.

Table A.3. Ranges of Recent Mean Harvests by the Commercial Troll Fishery in the EEZ and State waters of Southeast Alaska, based on the means (averages) and standard errors of the troll harvests of wild and enhanced stocks during the years 1976 through 1988^a.

Species	Thousands of Fish				Thousands of Pounds of Fish			
	Mean	S _x ^b	Low ^c	High ^d	Mean	S _x	Low	High
Chinook	268	46	255	281	4,131	745	3,924	4,338
Coho	1,057	472	981	1,245	7,266	3,176	6,385	8,147
Pink	484	215	424	544	1,564	684	1,374	1,754
Sockeye	6	3	5	7	35	16	31	39
Chum	27	24	20	34	196	163	151	241

^aThese values were obtained from Tables A.1 and A.2. Some of the individual annual values these means were based on are preliminary estimates; thus, these values are subject to change if the base data changes.

^bS_x is the sample standard deviation. The standard error is this value divided by the square root of the sample size, (n_i = 13, √13 = 3.6056).

^cThe Low value is the mean minus one standard error. For example, the low value for the number of chinook is (268 - 46/√13) = (268 - 13.28) = 254.72 ≈ 255.

^dThe High value is the mean plus one standard error.

Table A.4. Ex-vessel Value of Salmon Harvested by Troll Gear in Alaska, 1976 Through 1987, by Species.^a

<u>Year</u>	<u>Thousands of Dollars</u>					
	<u>Chinook</u>	<u>Coho</u>	<u>Pink</u>	<u>Sockeye</u>	<u>Chum</u>	<u>Total</u>
1976	4,517	5,011	405	6	28	9,966
1977	7,302	6,528	562	34	60	14,487
1978	11,447	9,113	761	21	160	21,501
1979	11,697	10,838	1,875	57	164	25,006
1980	9,411	5,406	508	15	77	15,674
1981	9,884	8,183	1,283	53	46	19,633
1982	11,208	12,727	525	18	36	24,626
1983	8,166	7,139	449	43	86	15,960
1984	10,883	14,595	795	70	160	26,570
1985	8,363	15,296	939	58	202	24,952
1986	NA ^b	NA	NA	NA	NA	NA
1987	NA	NA	NA	NA	NA	NA
<u>Means</u>						
1976-85	9,283	9,484	810	38	102	19,838

^aSource: ADF&G annual statistical leaflets on catch and production.

^bNA means the values are unavailable.

Table A.5. Mean Ex-vessel Price Per Pound for Salmon Harvested by Troll Gear in Alaska, 1976 Through 1987, by Species.^a

Year	Average Ex-vessel Dollar Per Pound ^b					
	Chinook	Coho	Pink	Sockeye	Chum	Total
1976	1.52	1.36	0.56	0.80	0.67	1.34
1977	1.83	1.57	0.47	0.91	0.62	1.53
1978	1.98	1.33	0.41	1.22	0.79	1.46
1979	2.27	1.79	0.82	1.42	0.87	1.79
1980	1.95	1.17	0.54	0.88	0.83	1.48
1981	2.37	1.33	0.56	1.20	0.62	1.52
1982	2.80	1.39	0.36	1.29	0.77	1.66
1983	1.88	0.84	0.31	0.93	0.57	1.09
1984	2.83	1.59	0.45	1.27	0.77	1.75
1985	2.39	1.32	0.35	1.35	0.52	1.35
1986	NA ^c	NA	NA	NA	NA	NA
1987	NA	NA	NA	NA	NA	NA
Means						
1976-85	2.19	1.37	0.48	1.13	0.70	1.50

^aSource: ADF&G annual statistical leaflets on catch and production.

^bMean price per pound calculated by dividing total ex-vessel value by the total pounds.

^cNA means the values are unavailable.

Table A.6. Number of Permanent and Interim-use Permits (Alaskan and Federal) Issued to Alaskan Residents and Nonresidents for the Alaska Power-troll Fishery and Total Fished, 1977 through 1988.^{a,b}

Year	Federal		Alaska			Total	
	Nontransferrable Permits Issued to		Permanent Permits Issued to	Permanent Permits Issued to	Interim Use Permits Issued	Power-Troll Permits	
	Residents	Nonresidents	Residents	Nonresidents		Issued	Fished
1977	-	-	698	231	41	970	750
1978	-	-	717	217	42	976	816
1979	0	1	719	220	40	980	820
1980	0	2	704	235	35	976	844
1981	0	1	713	226	31	971	794
1982	0	2	718	222	28	970	812
1983	0	2	723	216	29	970	812
1984	0	2	722	218	23	965	797
1985	0	2	730	212	21	965	832
1986	0	1	731	211	15	958	826
1987 ^C	0	1	742	200	15	958	829
1988 ^C	0	1	752	190	14	957	829

^aThe Alaska troll salmon fishery was open to entry by power and hand troll fishermen until 1975. In 1975, power trollers fishing in Alaskan waters or landing in Alaska came under a State limited-entry system. Commercial salmon trollers (hand or power) in the EEZ came under a Federal limited-entry system in 1979, when the Council's fishery management plan was implemented.

^bSource: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^cData for 1987 and 1988 are preliminary.

Table A.7. Number of Alaskan Permits Issued for and Fished, by the Alaska Hand-troll Fishery, 1977 through 1987.^{a,b}

Year	Permanent Permits Issued to Residents	Permanent Permits Issued to Nonresidents	Interim Use Permits Issued ^c	Total Hand-Troll Permits Issued	Permits Fished
1977	0	0	2,953	2,953	1,836
1978	0	0	3,923	3,923	2,624
1979	0	0	3,702	3,702	2,207
1980	0	0	2,436	2,436	1,667
1981	0	0	2,048	2,048	1,153
1982	660	36	1,213	1,909	1,067
1983	1,972	148	29	2,149	946
1984	1,954	165	27	2,146	860
1985	1,837	147	44	2,028	903
1986	1,809	148	18	1,975	792
1987 ^d	1,765	154	12	1,931	761
1988 ^d	1,698	162	8	1,868	777

^a The Alaska troll salmon fishery was open to entry by power and hand troll fishermen until 1975. Commercial salmon trollers (hand or power) in the EEZ came under a Federal limited-entry system in 1979, when the Council's fishery management plan was implemented. Hand trollers fishing in or landing in Alaskan waters came under a State limited-entry system in 1982.

^b Source: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^c Distribution of interim-use permits between Alaska residents and nonresidents unavailable.

^d Data for 1987 and 1988 are preliminary.

Table A.8. Number of Permanent Hand-troll and Power-troll Permits (Alaskan plus Federal) Issued to Alaskan Residents and Nonresidents, 1977 through 1988.^{a,b}

Year	HAND TROLL			POWER TROLL			TOTAL
	Permanent Permits Issued to Residents	Permanent Permits Issued to NonResidents	Total Permits Issued	Permanent Permits Issued to Residents	Permanent Permits Issued to Nonresidents	Total Permanent Permits Issued	Permanent Troll Permits Issued
1977	0	0	0	698	231	929	929
1978	0	0	0	717	217	934	934
1979	0	0	0	719	221	940	940
1980	0	0	0	704	237	941	941
1981	0	0	0	713	227	940	940
1982	660	36	696	718	224	942	1,638
1983	1,973	148	2,121	724	217	941	3,061
1984	1,957	163	2,120	723	219	942	3,061
1985	1,844	141	1,985	732	213	944	2,928
1986	1,823	142	1,965	732	211	943	2,900
1987 ^c	1,778	151	1,929	743	200	943	2,862
1988 ^c	1,698	162	1,860	752	191	943	2,803

^aThe Alaska troll salmon fishery was open to entry by power and hand troll fishermen until 1975. In 1975, power trollers fishing in Alaskan waters or landing in Alaska came under a State limited-entry system. Commercial salmon trollers (hand or power) in the EEZ came under a Federal limited-entry system in 1979, when the Council's fishery management plan was implemented. Hand trollers fishing in or landing in Alaskan waters came under a State limited-entry system in 1982.

^bSource: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^cData for 1987 and 1988 are preliminary.

Table A.9. Pounds of Salmon Landed by and Gross Earnings of Power Trollers Fishing Under Alaska Limited-Entry Permits, 1977 through 1988.^{a,b}

<u>Year</u>	<u>Alaska Permits Fished</u>	<u>Total Pounds Landed</u>	<u>Average Pounds Landed</u>	<u>Total Gross Earnings</u>	<u>Average Gross Earnings</u>
1977	750	7,273,420	9,698	\$12,036,382	\$16,049
1978	816	11,029,959	13,517	\$17,480,179	\$21,422
1979	819	10,657,919	13,013	\$21,469,415	\$26,214
1980	842	8,419,068	9,999	\$13,244,111	\$15,729
1981	793	10,456,912	13,196	\$16,249,385	\$20,491
1982	810	12,124,799	14,969	\$20,348,359	\$25,121
1983	810	12,167,857	15,022	\$13,486,482	\$16,650
1984	795	12,804,426	16,106	\$22,672,565	\$28,519
1985	830	15,292,181	18,424	\$21,079,991	\$25,398
1986	825	17,289,793	20,957	\$23,677,098	\$28,700
1987 ^C	828	11,084,504	13,387	\$21,606,039	\$26,094
1988 ^C	828	8,225,485	9,934	\$23,900,145	\$28,865

^aSource: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^bWeights include only commercial harvests landed on valid permits. Salmon associated with test fishing, illegal landings, derbies, educational permits, or unmatchable permits are excluded.

^cData for 1987 and 1988 are preliminary.

Table A.10. Pounds of Salmon Landed by and Gross Earnings of Hand Trollers Fishing Under Alaska Limited-Entry Permits, 1977 through 1986.^a

<u>Year</u>	<u>Alaska Permits Fished</u>	<u>Total Pounds Landed^b</u>	<u>Average Gross Landed</u>	<u>Total Pounds Earnings</u>	<u>Average Gross Earnings</u>
1977	1,836	2,332,685	1,270	\$3,321,653	\$1,809
1978	2,624	4,113,023	1,568	\$5,662,365	\$2,158
1979	2,207	3,623,672	1,642	\$6,409,227	\$2,904
1980	1,667	2,350,992	1,410	\$3,160,315	\$1,896
1981	1,153	2,630,867	2,282	\$3,458,925	\$3,000
1982	1,067	2,776,300	2,602	\$4,065,632	\$3,810
1983	945	2,557,372	2,708	\$2,487,259	\$2,632
1984	859	2,498,595	2,906	\$3,926,912	\$4,571
1985	903	3,155,554	3,499	\$3,924,913	\$4,347
1986	792	3,019,209	3,818	\$3,903,026	\$4,928
1987 ^c	761	2,137,226	2,808	\$3,717,825	\$4,888
1988 ^a	777	1,736,107	2,234	\$4,649,640	\$5,984

^aSource: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^bWeights include only commercial harvests landed on valid permits. Salmon associated with test fishing, illegal landings, derbies, educational permits, or unmatchable permits are excluded.

^cData for 1987 and 1988 are preliminary.

Table A.11. Average Gross Earnings and Average Price of Alaska Limited-Entry Permits for Power Trollers and Hand Trollers, 1977 through 1988^a

Year	POWER TROLLERS		HAND TROLLERS	
	Average Gross Earnings	Average Permit Price	Average Gross Earnings	Average Permit Price
1977	\$16,049	\$ 8,831	\$1,809	--
1978	\$21,422	\$15,457	\$2,158	--
1979	\$26,214	\$26,680	\$2,904	--
1980	\$15,729	\$33,308	\$1,896	--
1981	\$20,491	\$29,012	\$3,000	--
1982	\$25,121	\$21,630	\$3,810	\$4,036
1983	\$16,650	\$20,864	\$2,631	\$4,964
1984	\$28,519	\$19,456	\$4,567	\$4,732
1985	\$25,398	\$21,509	\$4,354	\$5,109
1986	\$28,700	\$24,776	\$4,929	\$5,252
1987 ^b	\$26,094	\$26,431	\$4,885	\$5,551
1988 ^b	\$28,865	\$29,782	\$5,984	\$6,446

^a Source: Alaska Commercial Fisheries Entry Commission, Summary Data Report 3b, 13 September 1989.

^b Data for 1987 and 1988 are preliminary.

Table A.12. Chinook Salmon Harvest by the Winter Troll Fishery and Comparisons with the Total Troll Harvests, 1970 through 1989.^a

Year	Vessel Landings	Number of Chinook	Chinook Per Landing	Percent of Total	Total Season Catch
1970	1,085	7,400	6.8	2.4%	305,000
1971	668	4,300	6.4	1.3%	334,000
1972	434	5,700	13.1	2.4%	242,000
1973	593	7,900	13.3	2.6%	308,000
1974	804	8,300	10.3	2.6%	322,000
Ave. 70-74	717	6,720	10.0	2.2%	302,200
1975	691	9,300	13.5	3.2%	287,000
1976	825	10,500	12.7	4.5%	231,000
1977	1,054	8,300	7.9	3.1%	272,000
1978	807	7,400	9.2	2.0%	376,000
1979	878	5,200	5.9	1.5%	338,000
Ave. 75-79	851	8,140	9.8	2.9%	276,000
1980	927	7,600	8.2	2.5%	300,000
1981	1,104	9,700	8.8	3.9%	248,000
1982	1,385	12,600	9.1	5.2%	242,000
1983	2,455	31,100	12.7	11.5%	271,000
1984	3,300	33,000	10.0	14.0%	236,000
Ave. 80-84	1,834	18,800	9.8	7.4%	259,400
1985	2,200	22,500	10.2	10.4%	217,000
1986	2,200	23,000	10.5	9.7%	236,000
1987	2,379	28,400	11.9	11.7%	242,000
1988	4,409	60,400	13.7	26.1%	231,000
1989	3,757	34,300	9.1	14.5%	235,800
Ave. 85-89	2,989	33,720	11.1	14.5%	232,360

^aSource: ADF&G Report to the Board of Fisheries, Regional Information Report 1J90-02, February 1990.

^bThe winter troll fishery runs from 1 October through 14 April. Accounting periods for the total season are the calendar years for 1970 through 1980 and accounting years of 1 October through 30 September for 1981 through 1989.

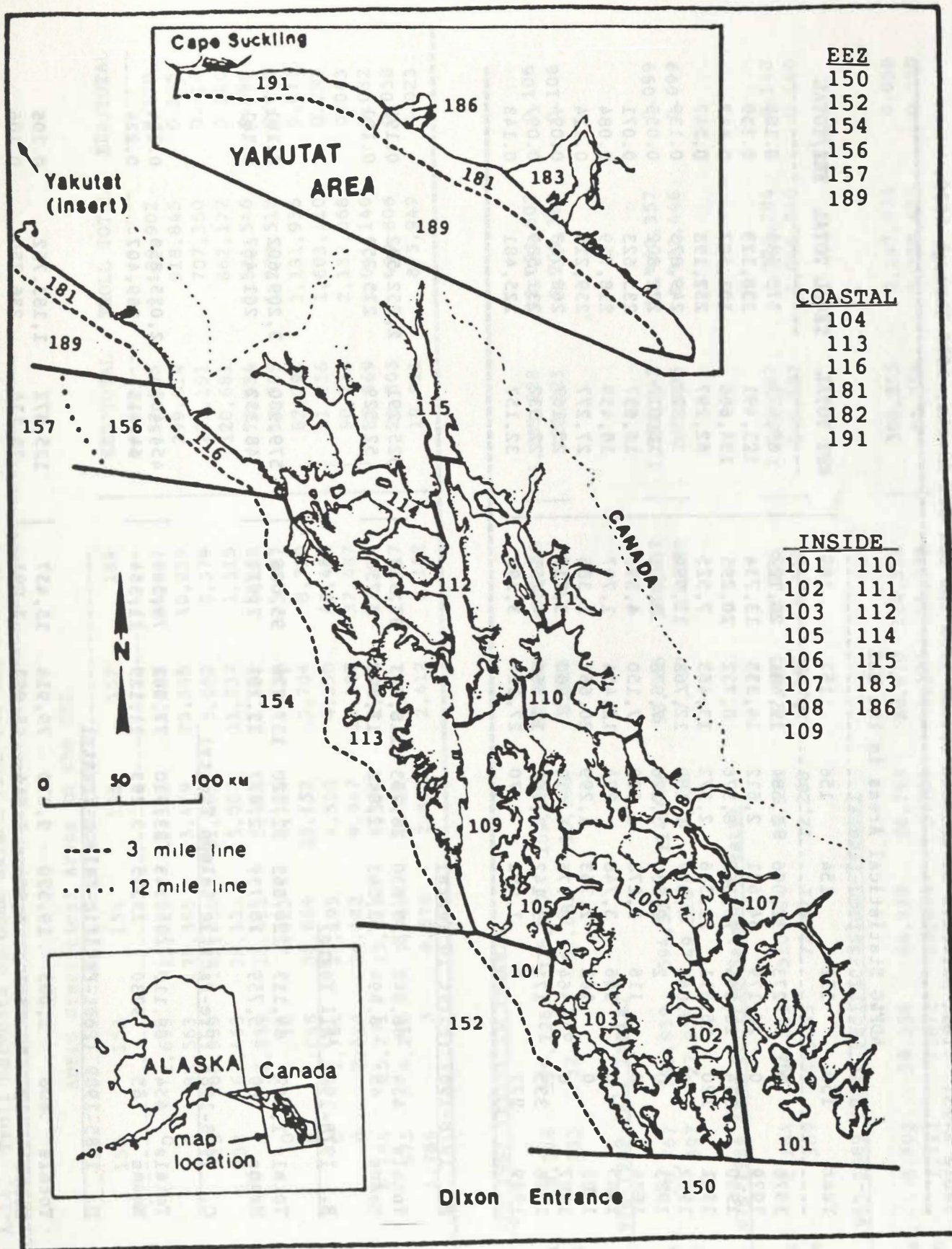


Figure A.1. Map of Southeast Alaska showing ADF&G statistical fishing districts for the commercial troll fishery.

Table A-13. Troll Harvests of Chinook Salmon from the EEZ off Alaska, 1978 Through 1989.

Year	ADF&G Statistical Areas in the EEZ						EEZ TOTAL	TROLL TOTAL	EEZ/TOTAL
	150	152	154	156	157	189			
1978	0	273	32,006	3,584	13,481	20,127	69,471	375,433	0.185
1979	0	26,179	64,631	2,612	14,335	13,734	121,491	338,329	0.359
1980	334	20,364	76,365	8,576	8,732	20,295	134,666	301,597	0.447
1981	120	16,311	22,506	2,372	13,463	7,525	62,297	252,193	0.247
1982	0	4,865	4,027	1,180	12,763	11,994	34,829	249,873	0.139
1983	0	2	2,530	3,226	7,978	1,281	15,017	272,802	0.055
1984	0	116	3,278	1,500	7,150	4,593	16,637	235,623	0.071
1985	0	306	3,748	224	12,454	1,707	18,439	218,759	0.084
1986	0	162	2,763	1,299	20,667	2,386	27,277	239,210	0.114
1987	0	364	8,776	4,410	7,900	3,717	25,167	268,713	0.094
1988	335	171	3,142	3,067	11,566	4,251	22,532	231,589	0.097
1989	273	0	1,091	70	27,327	3,396	32,157	225,481	0.143

A. 1978-1987 (First 10 Years)

Totals	454	68,942	220,630	28,983	118,923	87,359	525,291	2,752,532	0.191
Means	45	6,894	22,063	2,898	11,892	8,736	52,529	275,253	0.191

B. 1978-1989 (All Years)

Totals	1,062	69,113	224,863	32,120	157,816	95,006	579,980	3,209,602	0.181
Means	89	5,759	18,739	2,677	13,151	7,917	48,332	261,467	0.181

C. 1978-1984 (Pre-Pacific Salmon Treaty)

Totals	454	68,110	205,343	23,050	77,902	79,549	454,408	2,025,850	0.224
Means	65	9730	29335	3,293	11,129	11,364	64,915	289,407	0.224

D. 1985-1989 (Post-Pacific-Salmon-Treaty)

Totals	608	1,003	19,520	9,070	79,914	15,457	125,572	1,183,752	0.106
Means	122	201	3,904	1,814	15,983	3,091	25,114	236,750	0.106

Table A-14. Troll Harvests of Coho Salmon from the EEZ off the Coast of Alaska.

ADF&G Statistical Areas in the EEZ

Year	150	152	154	156	157	189	EEZ TOTAL	TROLL TOTAL	EEZ/TOTAL
1978	0	2,699	73,716	18,351	12,892	24,847	132,505	1,100,902	0.120
1979	0	83,563	178,365	3,479	23,348	10,259	299,014	918,845	0.325
1980	326	106,939	145,880	31,605	5,062	3,379	293,191	707,360	0.414
1981	1,838	62,463	38,121	5,007	11,737	1,515	120,681	862,177	0.140
1982	0	37,859	18,422	5,488	11,497	6,168	79,434	1,321,546	0.060
1983	0	10	4,921	3,796	4,455	5,387	18,569	1,279,518	0.015
1984	0	1,048	50,669	18,152	3,704	8,720	82,293	1,131,936	0.073
1985	0	1,761	27,195	4,588	4,230	43,482	81,256	1,603,110	0.051
1986	0	7,613	24,482	9,947	11,187	37,487	90,716	2,137,068	0.043
1987	6,164	25,771	15,116	9,574	1,520	27,424	85,569	1,041,140	0.082
1988	675	4,210	7,768	1,812	1,521	12,817	28,803	499,806	0.058
1989	1,764	3	9,678	2,872	2,412	3,182	19,911	875,949	0.023

A. 1978-1987 (First 10 Years)

Total	8,328	329,726	576,887	109,987	89,632	168,668	1,283,228	12,093,602	0.106
Mean	833	32,973	57,689	10,999	8,963	16,867	128,323	1,209,360	0.106

B. 1978-1989 (All Years)

Total	10,767	333,939	594,333	114,671	93,565	184,667	1,331,942	13,469,357	0.099
Mean	897	27,828	49,528	9,556	7,797	15,389	110,995	1,122,446	0.099

C. 1978-1984 (Pre-Pacific-Salmon-Treaty)

Total	2,164	294,581	510,094	85,878	72,695	60,275	1,025,687	7,322,284	0.140
Mean	309	42,083	72,871	12,268	10,385	8,611	146,527	1,046,040	0.140

D. 1985-1989 (Post-Pacific-Salmon-Treaty)

Total	8,603	39,358	84,239	28,793	20,870	124,392	306,255	6,147,073	0.050
Mean	1,721	7,872	16,848	5,759	4,174	24,878	61,251	1,229,415	0.050

Table A-15. Troll Harvests of Sockeye Salmon from the EEZ off the Coast of Alaska.

Year	ADF&G Statistical Areas in the EEZ						EEZ TOTAL	TROLL TOTAL	EEZ/TOTAL
	150	152	154	156	157	189			
1978	0	2	99	30	44	27	202	2,804	0.072
1979	0	787	931	16	57	17	1,808	7,018	0.258
1980	2	143	574	105	13	14	851	2,866	0.297
1981	15	340	466	11	80	15	927	7,470	0.124
1982	0	25	24	5	17	11	82	2,339	0.035
1983	0	1	19	29	30	21	100	7,968	0.013
1984	0	3	1,403	113	40	17	1,576	10,538	0.150
1985	0	1	71	37	21	38	168	7,755	0.022
1986	0	19	86	6	43	80	234	6,890	0.034
1987	15	113	106	63	52	77	426	9,726	0.044
1988	9	80	101	25	25	41	281	8,857	0.032
1989	6	0	64	8	80	15	173	16,827	0.010
A. 1978-1987 (First 10 Years)									
Total	32	1,434	3,779	415	397	317	6,374	65,374	0.098
Mean	3	143	378	42	40	32	637	6,537	0.098
B. 1978-1989 (All Years)									
Total	47	1,514	3,944	448	502	373	6,828	91,058	0.075
Mean	4	126	329	37	42	31	569	7,588	0.075
C. 1978-1984 (Before the Pacific Salmon Treaty)									
Total	17	1,301	3,516	309	281	122	5,546	41,003	0.135
Mean	2	186	502	44	40	17	792	5,858	0.135
D. 1985-1989 (Under the Pacific Salmon Treaty)									
Total	30	213	428	139	221	251	1,282	50,055	0.026
Mean	6	43	86	28	44	50	256	10,011	0.026

Table A-16. Troll Harvests of Pink Salmon from the EEZ off the Coast of Alaska.

ADF&G Statistical Areas in the EEZ									
Year	150	152	154	156	157	189	EEZ TOTAL	TROLL TOTAL	EEZ/TOTAL
1978	0	912	18,740	3,361	1,509	3,536	28,058	617,633	0.045
1979	0	40,210	76,263	1,309	4,802	41,050	123,634	629,144	0.197
1980	48	31,996	36,325	2,459	560	273	72,661	267,589	0.268
1981	1,018	26,853	37,785	2,397	7,356	786	76,661	577,256	0.132
1982	0	11,685	5,637	809	3,157	588	21,876	503,425	0.043
1983	0	8	1,355	961	2,593	446	5,363	498,503	0.011
1984	0	209	29,187	3,784	818	175	34,173	572,599	0.060
1985	0	293	7,911	812	1,796	1,582	12,394	968,958	0.013
1986	0	412	498	42	267	874	2,093	181,929	0.012
1987	1,641	6,484	6,148	619	702	632	16,226	487,007	0.033
1988	1,389	3,734	4,429	341	272	255	10,420	506,938	0.021
1989	407	14	7,599	722	2,523	267	1,532	1,558,443	0.007
A. 1978-1987 (First 10 Years)									
Total	2,707	119,062	219,849	16,553	23,560	9,942	391,673	5,304,043	0.074
Mean	271	11,906	21,985	1,655	2,356	994	39,167	530,404	0.074
B. 1978-1989 (All Years)									
Total	4,503	122,810	231,877	17,616	26,355	10,464	413,625	7,369,424	0.056
Mean	375	10,234	19,323	1,468	2,196	872	34,469	614,119	0.056
C. 1978-1984 (Before the Pacific Salmon Treaty)									
Total	1,066	111,873	205,292	15,080	20,795	6,854	360,960	3,666,149	0.098
Mean	152	15,982	29,327	2,154	2,971	979	51,566	523,736	0.098
D. 1985-1989 (Under the Pacific Salmon Treaty)									
Total	3,437	10,937	26,585	2,536	5,560	3,610	52,665	3,703,275	0.014
Mean	687	2,187	5,317	507	1,112	722	10,533	740,655	0.014

Table A-17. Troll Harvests of Chum Salmon from the EEZ off the Coast of Alaska.

Year	ADF&G Statistical Areas in the EEZ						EEZ TOTAL	TROLL TOTAL	EEZ/TOTAL
	150	152	154	156	157	189			
1978	0	22	1,531	212	246	402	2,413	26,193	0.092
1979	0	1,013	6,324	141	569	397	8,444	24,661	0.342
1980	1	584	2,436	405	78	41	3,545	12,201	0.291
1981	3	661	616	27	143	81	1,531	8,964	0.171
1982	0	50	91	9	11	10	171	5,699	0.030
1983	0	0	100	35	184	48	367	20,549	0.018
1984	0	20	2,060	141	126	22	2,369	28,035	0.085
1985	0	21	1,166	46	350	250	1,833	52,932	0.035
1986	0	45	601	49	294	530	1,519	51,394	0.030
1987	37	250	242	77	28	55	689	12,843	0.054
1988	80	1,237	2,765	341	194	50	4,667	85,828	0.054
1989	9	0	153	19	161	57	399	36,099	0.011

A. 1978-1987 (First 10 Years)

Total	41	2,666	15,167	1,142	2,029	1,836	22,881	243,471	0.094
Mean	4	267	1,517	114	203	184	2,288	24,347	0.094

B. 1978-1989 (All Years)

Total	130	3,903	18,085	1,502	2,384	1,943	27,947	365,398	0.076
Mean	11	325	1,507	125	199	162	2,329	30,450	0.076

C. 1978-1984 (Before the Pacific Salmon Treaty)

Total	4	2,350	13,158	970	1,357	1,001	18,840	126,302	0.149
Mean	1	336	1,880	139	194	143	2,691	18,043	0.149

D. 1985-1989 (Under the Pacific Salmon Treaty)

Total	126	1,553	4,927	532	1,027	942	9,107	239,096	0.038
Mean	25	311	985	106	205	188	1,821	47,819	0.038

APPENDIX E.

HABITAT SECTION

for the

FISHERY MANAGEMENT PLAN

for the

SALMON FISHERIES IN THE EEZ OFF THE COAST OF ALASKA

APRIL 1989

North Pacific Fishery Management Council

P.O. Box 103136

Anchorage, Alaska 99501

National Marine Fisheries Service
Alaska Region, Habitat Conservation Division

P.O. Box 021668

Juneau, AK 99802

I. SUMMARY AND POLICY

Few if any Pacific salmon populations remain undisturbed by the effects of human activities. Salmon populations in river systems where dams interrupt major migration routes have experienced drastic declines in the lower 48 states. Reductions in salmon populations have occurred in all areas due to habitat degradation from logging, road-building, irrigation, agriculture, urban growth, mining, and other activities.

Salmon production is directly related to salmon habitat quality and quantity which, in turn, directly affects allowable harvest in the commercial, recreational, and subsistence fisheries. Thus, harvest management and habitat management are inextricably related. Since harvest management is the responsibility of fisheries agencies and habitat management is the responsibility of land and water management agencies, there must be a two-way commitment to preserve anadromous salmonid resources and habitat through appropriate management which includes incorporation of conditions to prevent habitat loss from state and federal agencies, such as the NMFS Habitat Conservation Division.

The Pacific salmon fishery contributes to the food supply, economy and health of the Nation (including reduction of the trade deficit), ranks as largest nongovernmental employer in the state of Alaska (with sales exceeding those of tourism, mining, or forest products), provides recreational opportunities, and is an integral component of Alaska native culture and heritage. The fishery is dependent upon the survival and optimal production of salmon resources, which can only be assured by the wise management of all aspects of salmon habitat.

In this regard, the North Pacific Fishery Management Council, under the authorities and guidelines of the Magnuson Fishery Conservation and Management Act and the NMFS Habitat Conservation Policy, has put forward the following proposed policy statements (North Pacific Fish Management Council, 1988) concerning the conservation and protection of fish habitat in general, for public review and comment:

Recognizing that all species are dependent on the quantity and quality of their essential habitats, it is the policy of the North Pacific Fishery Management Council to:

Conserve, restore, and develop habitats upon which commercial, recreational and subsistence marine

fisheries depend, to increase their extent and to improve their productive capacity for the benefit of present and future generations. (For purposes of this policy, habitat is defined to include all those things physical, chemical, and biological that are necessary to the productivity of the species being managed.)

This policy shall be supported by three policy objectives which are to:

(1) Maintain the current quantity and productive capacity of habitats supporting important commercial, recreational and subsistence fisheries, including their food base. (This objective will be implemented using a guiding principle of NO NET HABITAT LOSS).

(2) Restore and rehabilitate the productive capacity of habitats which have already been degraded.

(3) Create and develop productive habitats where increased fishery productivity will benefit society.

The Council shall assume an aggressive role in the protection and enhancement of habitats important to marine and anadromous fish. It shall actively enter Federal decision-making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council. The Council will encourage and support research activities designed to provide for the optimal maintenance and management of salmon habitat in Alaska.

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I. INTRODUCTION

The availability and quality of salmon habitat are key determinants of the health and abundance of salmon populations. Widely varied ocean, estuarine, and freshwater habitats are each critical at different stages of the Pacific salmon life cycle, and each poses unique challenges to salmon survival. Although physiologically equipped to withstand changes in their environment consistent with their migration from freshwater to seawater and back again, within any of these zones salmon have exacting environmental requirements and limited tolerance for change.

The ocean environment provides salmon with a fairly stable habitat for feeding, growth, maturation, and migration. It is typified by physical and chemical equilibrium and an abundant food supply. Occasional disruptions occur in the ocean, however, (such as El Nino events, which are large-scale shifts in water masses) that can severely affect salmon stocks by disruption of the food web, displacement of food organisms, displacement of the ocean distribution of salmon, and changes in salmon migration routes.

By contrast, estuaries, where salmon feed and acclimate to shifts in salinity, are sites of complex and changeable water quality and quantity. Estuaries can also trap and accumulate contaminants from point and nonpoint source discharges, potentially posing a threat to salmon and the organisms upon which salmon rely for food.

The freshwater environment of Pacific salmon, where their life begins and ends, is characterized by cool, clean streams, rivers, ponds, and lakes. Salmonid reproduction and survival in this environment is dependent upon barrier-free streams, good water quality, abundant spawning gravel, resting pools and cover, sufficient food supply, and adequate stream flow.

The destruction and degradation of areas of estuarine and freshwater habitat, along with overfishing of stocks, have been responsible over time for reducing some salmon populations.

Maintaining current production, as well as rebuilding salmon populations to historical levels, requires integrated management decisions, policies, and programs that reflect the fundamental relationship between habitat and harvest. For example, the enormous natural returns of sockeye salmon to Bristol Bay, Alaska have been promoted through both maintenance of habitat and careful management of harvest and escapement, resulting in the world's most productive salmon fishery.

II. LIFE HISTORY

A. General.

The salmon life cycle begins with the deposition and fertilization of eggs in redds (nests) dug in the streambed or lake bottom by spawning adults. The fertilized eggs incubate in the gravel for several months before the young salmon (alevins or sac-fry) are ready to hatch. After hatching, the alevins remain in the gravel, nourished by the remaining egg yolk, for several weeks before emerging as swimming, ready-to-feed salmon fry. Depending on the species and location of the natal stream, there are three basic patterns of freshwater rearing for Pacific Salmon: (1) upon emergence from the gravel, almost immediate emigration from freshwater, typical of pink and chum salmon (and in some situations, sockeye); (2) short-term rearing in freshwater, with emigration during their first year of life as subyearling fish, typical of ocean-type (fall) chinook, some sockeye, and some chum; and (3) at least one winter's rearing in freshwater after emergence with emigration at age one or older, typical of coho, stream-type (spring) chinook, and most sockeye salmon.

In the ocean, salmon may migrate thousands of miles before returning to their natal stream to spawn 1 to 7 years later. In freshwater and in estuaries, juvenile salmon feed on aquatic and terrestrial insects, zooplankton, annelid worms, small crustaceans and mollusks, and small fish. Once in the ocean, young salmon add marine zooplankton to their diets, and after developing strong jaws and teeth, salmon feed voraciously on a variety of marine species such as crustaceans, squid, herring, capelin, and sand lance.

Salmon also serve as food for a variety of predators in freshwater and in the ocean. While in freshwater, juveniles are preyed upon by larger fish, birds, mammals, and reptiles. Saltwater predators include squid, larger fish, birds, and various marine mammals.

Pacific salmon range naturally from southern California to arctic Alaska, northern Siberia, and central Japan. Their life histories vary somewhat depending upon where they live. This section contains summaries of the Pacific salmon species occurring within the management area of the NPFMC (Bell, 1986; Hart, 1973; Scott and Crossman, 1973; Straty, 1981). Table 1 summarizes the biological data.

Table 1. Biological Data for Pacific Salmon in Alaskan Waters.

<u>Characteristic</u>	<u>Chinook</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Sockeye</u>
Length of stay in freshwater after emergence.	Days to 2 years	1 to 3 years	Few days	Few days	Days to 3 years
Length of stay in the ocean	1 to 5 years	0.5 to 1.5 yr	Almost 2 years	2 to 5 years	2 to 5 years
Average age at maturity.	4 to 6 years	3 to 5 years	2 years	3 to 5 years	3 to 6 years
Average weight at maturity	17 to 50 pounds	7 to 12 pounds	3 to 5 pounds	10 to 15 pounds	5 to 8 pounds
Principal spawning months	July-Sep	Sep-Dec	Jul-Sep	Aug-Oct	Jul-Sep
Mean number of eggs per female	5,000	3,500	2,000	3,000	4,000

B. Sockeye Salmon

The range of sockeye salmon in the eastern Pacific Ocean extends from northern California to Point Hope, Alaska. While sockeye spawn mainly in streams associated with lakes, or on lake shoals, they also spawn in some large glacial river systems in Alaska without lakes. Upon hatching, fry generally move directly into lakes (or glacial river sloughs), where they rear 1 to 3 years before migrating to the ocean. Some estuarine and near-shore ocean rearing of sockeye fry has been observed in Alaska, but the extent appears limited. Seaward migration starts in mid-May, with smolts guided by salinity gradients once they reach the estuary. In response to favorable ocean temperatures, and increased availability of larger prey, growth is usually rapid during the first summer at sea and slower thereafter. During this migration, the juveniles school and are most abundant near the surface. This period of seaward migration to the North Pacific lasts longer than six months. In the ocean, sockeye feed mainly on crustaceans (mostly copepods and euphausiids), squid, and small fish, whereas in freshwater they feed primarily on insects and zooplankton.

Stocks from Asia and North America intermingle in the North Pacific and are subject to high seas fisheries of Japan and other nations. Sockeye usually reach maturity after 2 or 3 years in the ocean, although some stocks have a significant component that matures after 4 years in the ocean. As they begin their spawning migration from the North Pacific, the different stocks progressively segregate according to the specific location of their home stream. Adult sockeye generally range in weight from 5 to 8 pounds and are about 2 feet long.

Sockeye juveniles school in the upper water layers during their estuarine and ocean residence and they and their food organisms are particularly vulnerable to oil spills or other marine pollution at this time. Spawning habitat and freshwater and estuarine rearing habitat can be degraded by timber harvesting, mining, hydroelectric projects, and real estate development.

C. Chinook Salmon

Chinook salmon live in freshwater from central California through northwestern Alaska, mainly in larger rivers. Different stocks spawn at different times of the year, from spring through summer and fall, and into the winter, and require larger spawning substrate, greater water velocities and depths. In the Yukon River, chinook have been known to migrate more than 2,000 miles inland to reach their spawning grounds. Young chinook remain in freshwater for up to 2 years before beginning their seaward migration; generally, seaward migration occurs earlier in the southern portion of chinook range, with freshwater residence extended in the northern portion. Chinook usually reach maturity after spending 2 to 4 years in the ocean and are the largest of the five species of Pacific salmon. At maturity, they usually weigh between 10 and 50 pounds, with an average weight of about 18 pounds, and are approximately 2 to 3 feet long. Chinook are known, however, to exceed 4 feet in length, with weights greater than 100 pounds. Chinook can be highly migratory during the oceanic phase of their life cycle but offshore ocean distribution is more limited (usually within 200 miles of the coast) than the other four species of eastern Pacific salmon. Chinook are apparently the least surface oriented of the Pacific salmon, utilizing deeper waters during their ocean residence (Major, et al. 1978). Food of chinook in saltwater consists chiefly of herring and sand lance, and smaller quantities of other small fishes, crustaceans, and squid.

Alaska stocks of chinook are almost entirely stocks that return to their spawning grounds in the spring (spring or stream-type chinook) and whose offspring spend 1 or more years in freshwater before migrating to the sea. The major exception is the Situk River stock which has a major component that returns to the

spawning grounds in the fall (fall or ocean-type chinook) with young that migrate to sea in the year they hatch.

Chinook salmon are highly vulnerable to the loss of freshwater habitat related to impoundments on larger rivers (in particular, the Columbia River dams have caused major declines in Columbia River chinook populations. In Southeast Alaska, salvage logging is also a habitat threat because it removes the fallen trees from the rivers that provide shelter and enhance the food supply for salmon.

D. Coho Salmon

Coho salmon are common throughout the waters of northern California to northwestern Alaska. Alaskan coho rear from 1 to 3 years in fresh water prior to their seaward migration as smolts. After 18 months in the ocean, spawning normally occurs in September through December in smaller streams and tributaries of large streams. At maturity, coho usually weigh around 10 pounds, but can be up to 30 pounds and 3 feet long. In salt water, coho feed largely on herring, sandlance, other small fishes, squid, and assorted crustaceans.

Because of their year round life in small streams, ponds, and lakes, coho are perhaps the most vulnerable to man's activities on land, particularly to timber harvesting, mining, and associated development such as road building. For example, sediment inputs into streams associated with logging have been shown to decrease coho egg to fry survival (Cederholm et al 1981, 1987; Hartman et al, 1987).

E. Pink Salmon

Pink salmon are common from Puget Sound northward, with greatest returns in the eastern Pacific Ocean occurring in Prince William Sound and southeast Alaska. Pinks reach maturity at age two with no overlap in generations. Pinks spawn from June through November in small streams, tributaries, larger rivers, as well as in the intertidal gravels at the mouths of streams. Upon emergence, the fry migrate almost directly to the estuary. The smallest of the Pacific salmon species, pinks grow to an average of 3 to 5 pounds in weight and less than 2 feet in length. Pink salmon generally feed on small crustaceans, zooplankton, swimming molluscs, and small fish.

Pink salmon spawning and intergravel incubation habitat can be jeopardized by sediment increases associated with timber harvests, mining, and other streamside activities of man, as well as by pollution, damming, and other water uses.

F. Chum Salmon

Chum salmon range from northern California to the MacKenzie River drainage in Canada. They usually spawn in the lower reaches of rivers, often just upstream from brackish water or tide flats during late summer and fall. In the Yukon River, however, chum migrate nearly 2,000 miles upriver. Fry proceed to saltwater soon after emerging from the gravel, with an extended rearing period in estuarine and nearshore waters. Chum reach maturity after spending 2 to 6 years in salt water, reaching average weights of 10 to 15 pounds and average lengths of 2 feet. Zooplankton, small crustaceans, and squid constitute the bulk of the chum diet, but they also eat small fish.

Chum spawning and incubation habitat is vulnerable to sediment increases associated with timber harvesting, which has been observed to increase egg-to-fry mortality (Hartman et al. 1987), mining (particularly placer mining), and other sediment-producing activities of man, as well as pollution, damming, and other water uses.

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III. HABITAT REQUIREMENTS

Life history strategies of Pacific Salmon use three major ecosystems as habitat: freshwater, estuarine, and ocean. Residence time and habitat within each ecosystem vary according to species, growing season, and stock characteristics. Production of salmon is subject to highly complex interactions of physical, chemical and biological processes within and between these three ecosystems. While our understanding of these processes is incomplete, we have a better knowledge of the limitations of salmon habitat in freshwater streams than in estuaries or the ocean.

A. Freshwater

Key physical factors in salmon streams are migration routes; migrational timing; streamflow; water temperature; riparian vegetation; stable, appropriately sized spawning gravel; cover availability; suspended sediments; bottom substrate; and water depth and velocity. Key chemical factors in streams include dissolved oxygen, phosphate, and nitrate concentrations. Some of these factors are closely interrelated. An alteration in one parameter can affect the others and ultimately, salmon abundance and productivity.

Migration Routes

The successful migration of adult salmon to upstream spawning areas depends on barrier-free routes. Waterfalls, debris jams, dams, diversions, culverts, excessive water velocities, and reduced flows can impede or prevent salmon movement in streams.

Migration barriers can frequently be modified to allow salmon passage. Dams have been equipped with fish ladders, lifts, or bypass systems. Falls have been altered or fish ladders have been installed to allow salmon access to temporarily blocked or previously inaccessible areas, increasing available spawning and rearing habitat. Debris jams can be removed; however, since instream debris provide important habitat for salmon, such jams should be carefully evaluated and removed only if they constitute a barrier.

Streamflow

Streamflow affects the availability of instream cover, dissolved oxygen, temperature, pool areas for rearing of juveniles and resting adult migrants, spawning substrate, channel morphology and sediment transport (Chevalier et al., 1984). The effects of

streamflow fluctuations on salmon depend on its magnitude, duration, and timing. Low flow during spawning season can inhibit reproduction by crowding the fish or by forcing them into areas less suitable for spawning. Low flow in the summer is often associated with increased water temperatures, lower dissolved oxygen, and delayed juvenile migration to the sea. In the winter, low flows can result in the freezing of interstitial water. In both instances, low flows can result in direct mortality to eggs and juvenile salmon.

Excessive high streamflow increases water velocity, scouring the substrate and washing away eggs, fry, and gravel suitable for incubation and cover. When high water recedes, adults, fry, or juveniles can be stranded in isolated pools and die as a result of high temperature, freezing, desiccation, oxygen depletion, or predation.

Water Quality

Water Temperature - Stream temperature is a key determinant in the suitability of habitat for salmon production. It is influenced by a combination of factors, including stream flow, gradient, riparian shading, altitude, orientation, groundwater influence, and weather. Table 2 shows normal spawning and incubation temperature ranges for Pacific salmon.

Table 2. Recommended Temperature Ranges (°F) for Spawning and Incubation of Salmon (from Reiser and Bjornn, 1979, as adapted from Bell, 1986).

<u>Species and Type</u>	<u>Spawning</u>	<u>Incubation</u>
Fall Chinook	42 - 57	41 - 58
Spring Chinook	42 - 57	41 - 58
Summer Chinook	42 - 57	41 - 58
Coho	40 - 49	40 - 56
Pink	45 - 55	40 - 56
Chum	45 - 55	40 - 56
Sockeye	51 - 54	40 - 56

Water temperature is a critical component of habitat at all stages of a salmon's life cycle. For example, eggs mature at various rates depending upon water temperature during incubation, with emergence usually timed to coincide with the optimal availability of food organisms. Elevated water temperatures can cause premature emergence, resulting in an inadequate food source and starvation of fry (Chevalier et al., 1984). In general, adults tolerate temperature fluctuation better than do the eggs and young. Spring chinook and coho probably suffer least under conditions of prolonged exposure to increased temperature, whereas pink and chum are the most sensitive (Brett, et al., 1958). Extreme high or low temperatures can be lethal to all eggs, fry, and adults.

In addition to direct mortality, excessively high or low water temperatures can inhibit plankton growth, influence dissolved oxygen levels and nutrient concentrations, or affect the growth, condition, and behavior of fish. Prolonged temperature alteration can be conducive to undesirable microorganisms, including pathogens. For example, the myxobacteria Columbiana becomes a serious pathogen when water temperature rises above 18°C, and may cause heavy mortality (Macy, 1954). Similarly, when outbreaks of bacterial kidney disease occur in waters with elevated temperatures, high mortality occurs (Earp et al., 1953). Increased temperature may lower the resistance of salmon to disease, and may intensify the toxicity of pollutants (Sylvester, 1971). While high water temperature, in general, is considered less critical as a habitat threat than it is in habitat to the south, temperature sensitive streams have been identified in Alaska.

Dissolved Oxygen (DO) - Oxygen concentrations in salmon streams are generally near saturation, unless affected by extreme organic loads which depress DO. Such organic loads can be associated with activities such as logging, instream construction, or sewage and industrial waste discharges. Low levels of dissolved oxygen may block migration, impair motility, reduce growth, or cause the death of salmon. Oxygen levels of at least 80 percent saturation are desirable for spawning salmon, with temporary levels no lower than 5.0 mg/l (Reiser and Bjornn, 1979). These levels should also be suitable for migrating fish.

Laboratory research indicates a relationship between DO, water velocity, and the size of fry at hatching. At higher oxygen concentrations and velocities, emergent fry are larger (Silver et al., 1963). Other research has concluded that while low oxygen concentrations early in the incubation period can increase biological defects and delay hatching, low oxygen concentrations in the later stages can stimulate premature hatching (Alderdice et al., 1958). In either instance, low oxygen concentrations result in fry that are smaller and weaker than those incubated

under conditions of higher oxygen concentrations (Silver *et al.*, 1963; Shumway *et al.*, 1964). These smaller and weaker fry almost certainly suffer higher mortality than normal fish.

As the water temperatures in streams increase, less oxygen can be dissolved in the water. When the dissolved oxygen is further reduced by biological activity, chemical reactions, or both, salmon have been observed to die from lack of oxygen, even in the relatively cool streams of Southeast Alaska (Murphy, 1985).

Inorganic Nutrients - Although dissolved oxygen is a critical factor determining the community found in a habitat, phosphates and nitrates are also important (Chevalier *et al.*, 1984). Increased phosphate and nitrate concentrations can increase primary production (plant growth), which increases the biochemical oxygen demand of a stream (through decay of organic matter), decreases levels of dissolved oxygen, and eventually leads to eutrophication. This process is frequently observed in sluggish bodies of warm water, or in waters receiving high levels of phosphorus and/or nitrogen-containing wastes and in general is rarely a habitat threat in Alaskan waters.

Sediments - Sediments that remain in the water (suspended sediments) contribute to the turbidity of a water body. Increased turbidity can reduce light penetration and productivity of waters, as well as abrade salmon gill surfaces, disrupting respiration. In general, prolonged exposure to turbidities of 200-300 ppm and greater is lethal (Gibbons and Salo, 1973). Shorter exposures to turbidities of 90 ppm and greater may also reduce survival when accompanied by other stresses (Gibbons and Salo, 1973). Salmon will avoid or cease migration in waters with high turbidity (Reiser and Bjornn, 1979; Bisson and Bilby, 1982). Studies indicate that high turbidity may induce a thermal barrier to migration as well, since turbid water absorbs more heat (radiation) than clear water (Reiser and Bjornn, 1979). There is some evidence that smolts exposed to high levels of suspended sediment in freshwater are less capable of surviving the osmoregulatory changes that occur when they migrate to sea (Ross, 1982).

Sediments that settle out of the water column (bedload sediments) cause comparatively more damage to salmon than suspended sediments. Bedload sediments fill gravel interstices, decreasing oxygen exchange in interstitial waters. The result is reduced oxygen available to incubating eggs, which can be smothered. Bedload sediments can prevent fry from emerging and can continuously bury the substrate, reducing invertebrate diversity and abundance, thereby reducing food available to fry, if they are able to emerge. Silt can also harden as it becomes packed

into gravel interstices, making spawning difficult or impossible and jeopardizing overwinter rearing habitat.

Research to date indicates that the lethal effects of sediment are greatest during the developmental stages of salmon, since once hatching and emergence occur, the physical environment becomes secondary in importance to the availability of food (Gibbons and Salo, 1973) at least during the first summer. It has also been suggested that the indirect effects of increased sedimentation cause more damage to fish populations than direct lethal effects. Eggs, alevins, and salmonid food organisms may be more vulnerable to lethal effects of sedimentation at much lower levels than adult fish (Cordone and Kelley, 1961). While many glacial streams and lakes in Alaska are naturally turbid, many of these rivers and lakes support significant salmon populations. Reductions in fish productivity in these naturally turbid glacial streams are apparently the result of reduced food production (Lloyd, 1987) rather than sedimentation.

Substrate

The porous gravel substrate of salmon streams is crucial to salmon reproduction. Eggs incubate in the gravel, where alevins remain after hatching until their yolk sac is absorbed. When alevins emerge as swimming fry, the gravel substrate interstices provide protective cover from predators.

Circulation of interstitial water carries dissolved oxygen to and metabolic wastes away from incubating eggs. Reduced velocity of circulating interstitial water can result in reduced size at hatching (Silver et al., 1963), or death of eggs or alevins. A high percentage of very fine materials in the gravel is the usual cause of poor interstitial water flow and high mortality from egg deposition to emergence. Such sedimentation is the result of excessive erosion, frequently caused by road construction as well as poor logging practices and placer mining.

Coarse substrate (rubble or cobble) is an important habitat component for overwintering juvenile salmonids (Bjornn, 1971; Bustard and Narver, 1975; Heifetz, et al. 1986). Once the interstices in this substrate have silted in, its value as habitat is nullified (Hillman, et al., 1987).

Shoreside Vegetation and Large Organic Debris

Riparian vegetation stabilizes stream banks and helps regulate stream temperature by providing shade. It serves the important function of filtering nutrients from run-off, preventing over-enrichment of the stream, while also providing a source of organic matter and insects. It serves the same function in lakes

and ponds. Studies have shown that plant materials are important sources of food for aquatic invertebrates (Sekulich and Bjornn, 1977) upon which juvenile salmonids feed. Shoreside areas contribute logs and stumps (known as large organic debris, LOD) an important component of rearing salmonid habitat (Murphy et. al. 1985; Heifetz, et. al. 1986). While LOD can form jams, complete barriers to fish migration are rare. Overhanging vegetation, LOD, undercut banks, and submerged vegetation all provide hiding and resting cover for salmon in freshwater. In the large rivers of Alaska, LOD provides critical habitat, particularly for chinook salmon, .

B. Estuarine/Early Marine Habitat

Fishery scientists generally agree that most of the young salmon that die in marine waters occurs during their brief residence as juveniles in estuarine and coastal waters (Parker, 1965). While the quantitative significance of estuarine factors to the ultimate survival of adult salmon has not been established, estuaries are known to be important habitat of juvenile Pacific salmon, providing productive foraging areas resulting in high growth rates (in some cases, highest in their life history), critical habitat for physiological transition, and possible refuge from predators (Simenstad, et. al. 1982).

The length of residence in the estuaries varies by species, with pink and sockeye juveniles spending little time in estuaries, while chum are there for several months in the early spring, coho for several months in late spring, and chinook juveniles present year round in some estuaries (Myers, 1980; Healy, M.C. 1982; Levy and Northcote, 1982).

Estuaries are important food producers for salmon, with the benthic organisms being more important in the inner parts of estuaries and pelagic organisms being more important in the outer parts. Many of the benthic forms consumed are themselves detritivores. There is an important link between juvenile salmon production and detritus-based food webs in estuaries (Sibert et al. 1978).

Survival in estuaries and nearshore habitat can be critical to the return of adult salmon. For example, pink salmon in British Columbia experienced a much greater natural mortality during the initial period of life (40 days) in the coastal marine waters than the following period from time of seaward migration to adult return (410 days) (Parker, 1965). Pacific Salmon also pass through estuaries as maturing adults returning from the ocean to freshwater to spawn, usually during the period from June through October. Perhaps because feeding and the use of the estuarine habitat at this time are limited, little is know about adult use of estuaries. Estuaries, however, are well known as areas where

adult salmon adjust their osmoregulatory mechanisms before entering freshwater, and some salmon aggregate in rather specific staging areas in the estuary before moving upstream (Stauffer, 1970). Individual estuarine residence time can be as long as six weeks for coho, chum and chinook adults (Simenstad, et. al. 1982).

C. Ocean/High Seas Habitat

The habitat and life history of salmon in the ocean has been studied much less than that in freshwater and inside marine ecosystems (such as Puget sound). We do know that juveniles (here, the term juvenile meaning those seaward migrating salmon that have entered the estuarine or marine waters but have spent less than one year in this environment) migrate seaward along the coasts, eventually moving offshore as their size increases. Growth is rapid during their first summer at sea but slows down thereafter. This period of ocean life may last from a few months to several years depending on the species of salmon and ocean growing conditions. More than one generation of sockeye, chum, chinook and coho are present in ocean habitats at a given time. Most adults remain offshore until they near their home streams, but some chinook and coho stay in coastal waters and bays until they mature.

The range of tolerable and preferred sea-surface temperatures is different for each species of salmon in the North Pacific Ocean, and these ranges change from spring through fall (Table 3, Manzer et al., 1965). Sockeye and chum salmon preferred the lowest sea-surface temperature range; pink salmon an intermediate range; and chinook and coho the highest range. From May through July and August, all salmon species preferred increasingly higher temperatures; in September, they again preferred colder waters. Annual differences in the seasonal distribution of juvenile sockeye salmon have been observed in Bristol Bay and have been attributed to these extreme variations in sea temperature (Straty 1974, Straty and Haight, 1979). Annual variations in sea temperature significantly affect the distribution of maturing salmon, the growth of both maturing and juvenile salmon, and the migration routes of adults returning towards their freshwater spawning areas. Annual variations in sea temperatures may indirectly influence the survival of juvenile salmon by influencing growth rate. Outmigrating juvenile salmon respond to salinity gradients with the terminal preference being that of the open ocean. Variations in food type and abundance also appears to result in corresponding variations in distribution and growth of juvenile salmon.

Table 3. Probable tolerable and preferred sea-surface temperatures for Pacific salmon (from Manzer, et al. 1965)

<u>Species of Salmon</u>	<u>Tolerable range (°C)</u>	<u>Preferred range (°C)</u>	<u>Reference Month for preferred range</u>
Sockeye	1-15	2, 3-9	May, September
Chum	1-15	2, 3-11	May, September
Pink	3-15	4-11	May, June
Coho	5-15	7-12	May-July
Chinook	2-13	7-10	July-September

IV. HABITAT CONCERNS

A. Introduction

Habitat loss and alteration have reduced and jeopardized, and continue to reduce and jeopardize, salmon populations in Alaska. Losses of salmonid habitat have occurred as a result of the effects of resource development (e.g., logging, mining, hydroelectric development) and other activities of man (e.g., urbanization).

Such habitat modification may lower both the amount and the quality of salmon harvests through physical changes or chemical contamination of habitat. Life stages differ in their habitat requirements and 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 and may not be detected for a variety of reasons, or may be delayed in becoming evident. The process of habitat degradation, however, 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 on salmon stocks of habitat alteration from the effects of other factors such as harvests, predation, and natural environmental fluctuations.

The following sections discuss the major sources of habitat alteration that potentially threaten salmon populations and associated fisheries and related industries of Alaska.

B. Offshore petroleum production.

This document summarizes the Council's concern about offshore oil (petroleum) production and salmon habitat. Additional information can be found in Berg (1977); Deis, et al. (1983); Outer Continental Shelf Environmental Assessment Program 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. Areas where oil and gas leases have occurred or is scheduled in the area

include the Navarin Basin (1989)(Morris, 1981), St. George Basin (1990)(NMFS, 1979), North Aleutian Basin (1990)(NMFS, 1980), Gulf of Alaska\Cook Inlet (1984)(Morris et al. 1983) and the Shumagin Basin (1992)(Morris, 1987). State of Alaska offshore sales have also taken place. Oil is currently being produced from rigs in the Arctic (Beaufort Sea) and Gulf of Alaska (Cook Inlet).

Oil and gas related activities 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 location and construction of offshore drilling rigs and platforms, loading platforms, and other shoreside facilities, tanker terminals, pipelines, and tankering of oil. We have noted oil tankers and other forms of transporting oil are the major causes of oil spills.

Large oil spills are the most serious potential source of oil and gas development-related pollution in the eastern Bering Sea, Cook Inlet, 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, as happened in the Gulf of Mexico several years ago when a wellhead blew out. Chronic oil spills which build up in the sediments around rigs and facilities are also a problem. 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, proximity to shore, oceanographic conditions, and the season. Although oil is toxic to all marine organisms at high concentrations (parts per million), 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). Oil spills in estuaries and other marine waters probably affect salmon more through their effects on salmon food organisms than on the salmon themselves.

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 estuaries, 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 and greater) to produce a surface slick covering up to several hundred square kilometers of surface area. Aromatic hydrocarbons 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. Vertical 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. High wave action drives oil droplets into shallow water bottom sediments and into the water column. Suspended sediment can also act to carry oil to the seabed. It is believed up to 70 percent of spilled oil may be incorporated in seafloor sediments where it is available to deposit-feeding organisms.

Oil mixed into bottom sediments persists for years and becomes a long term source of low level pollution. Cold temperatures slow the evaporation biodegradation processes, so toxic hydrocarbons persist longer. Oil can also be trapped by ice. Toxic aromatic fractions mixed to depth under the surface slick could cause mortalities and sublethal effects to individual salmon. However, the acreage contaminated would appear negligible in relation to the overall area of available habitat of Pacific salmon in the Alaska OCS. 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.

Perhaps for that reason, oil spills at sea generally are believed to be local and transitory, having only minor effects on fish and shellfish populations overall. Measurable damage to fishery stocks from such an oil spill would appear to be the exception rather than the rule. However, if an oil spill reaches nearshore areas with productive nursery grounds, such as an estuary, or areas containing high densities of eggs, fry, or smolts, a year's production could possibly be reduced, and any fishery dependent on it may be affected in later years. An oil spill at a gyre or during other critical periods could also result in disproportionately high losses of the resource compared to similar spills in other areas. Bristol Bay juvenile sockeye salmon, for example, school and are most abundant in the upper 2 meters of water during seaward migration (Straty, 1974). If an oil spill were to occur in Bristol Bay during the seaward migration, the sockeye juveniles could suffer mortality. Laevastu and Marasco (1985) estimated mortality of outmigrant Bristol Bay sockeye smolts at a maximum of 13 percent given several scenarios.

Tainting of salmon flesh is a potential problem in areas subject to either chronic or acute oil pollution. Salmon exposed to oily conditions acquire an oily or objectionable taste. Environmental Protection Agency criteria governing tainting in fisheries products state: "materials should not be present in concentration that individually or in combination produce undesirable flavors which are detectable by organoleptic tests performed on edible portions." Tainting is, therefore, of great

concern to commercial fishermen due to the fear that tainted catches will be refused at the processing plant as well as potential damage and loss of gear due to contamination. The July 2, 1987, spill (between 53,000 and 160,000 gallons) which occurred in Cook Inlet resulted in fouled commercial fishing gear and oiled fish being rejected by fish processors.

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 and of drilling fluids and produced waters in the water column. These materials likely would contain heavy metals, hydrocarbons, and other chemical compounds that would be released to the environment. Congress is scheduled to determine by June, 1988, whether oil and gas waste should be regulated as hazardous waste. Dredged materials from pipeline laying may also be released into the environment. Again, these activities may be of concern if they occurred in habitats of special biological importance to salmon stocks or their food organisms.

C. Forest Practices

Ranking forest practices as anything but the primary habitat threat to salmon habitat in Alaska is sure to generate heated debate. A number of forest practice activities can impact salmon habitat, including road construction and maintenance, use of forest chemicals, and timber harvest itself. These activities may increase bedload and suspended sediments, alter streamflow, introduce excessive nutrients, destabilize or remove large organic debris (LOD), decrease future sources of LOD needed for instream habitat, increase streambank erosion, cause landslides and debris torrents, alter temperature regimes, and have toxic effects on biota. Figure 1 illustrates the relationship of forest harvesting to changes in fishery habitat and resources.

Road Building

Forest road construction can destabilize slopes and increase erosion and sedimentation. In fact, forest road construction has been described as the major source of erosion caused by timber harvest activities (Gibbons and Salo, 1973). This erosion occurs in two forms, as mass soil movement (i.e., landslide) and as surface erosion (Yee and Roelofs, 1980). Both types of erosion can introduce large amounts of debris and sediment into adjacent streams for many years following initial construction. Erosion is most severe where poor construction practices are allowed, inadequate attention is paid to proper road drainage, and where construction occurs in inclement weather. After construction and during use, unpaved logging roads are a chronic source of sediment input to streams. Stream crossings by forest roads may

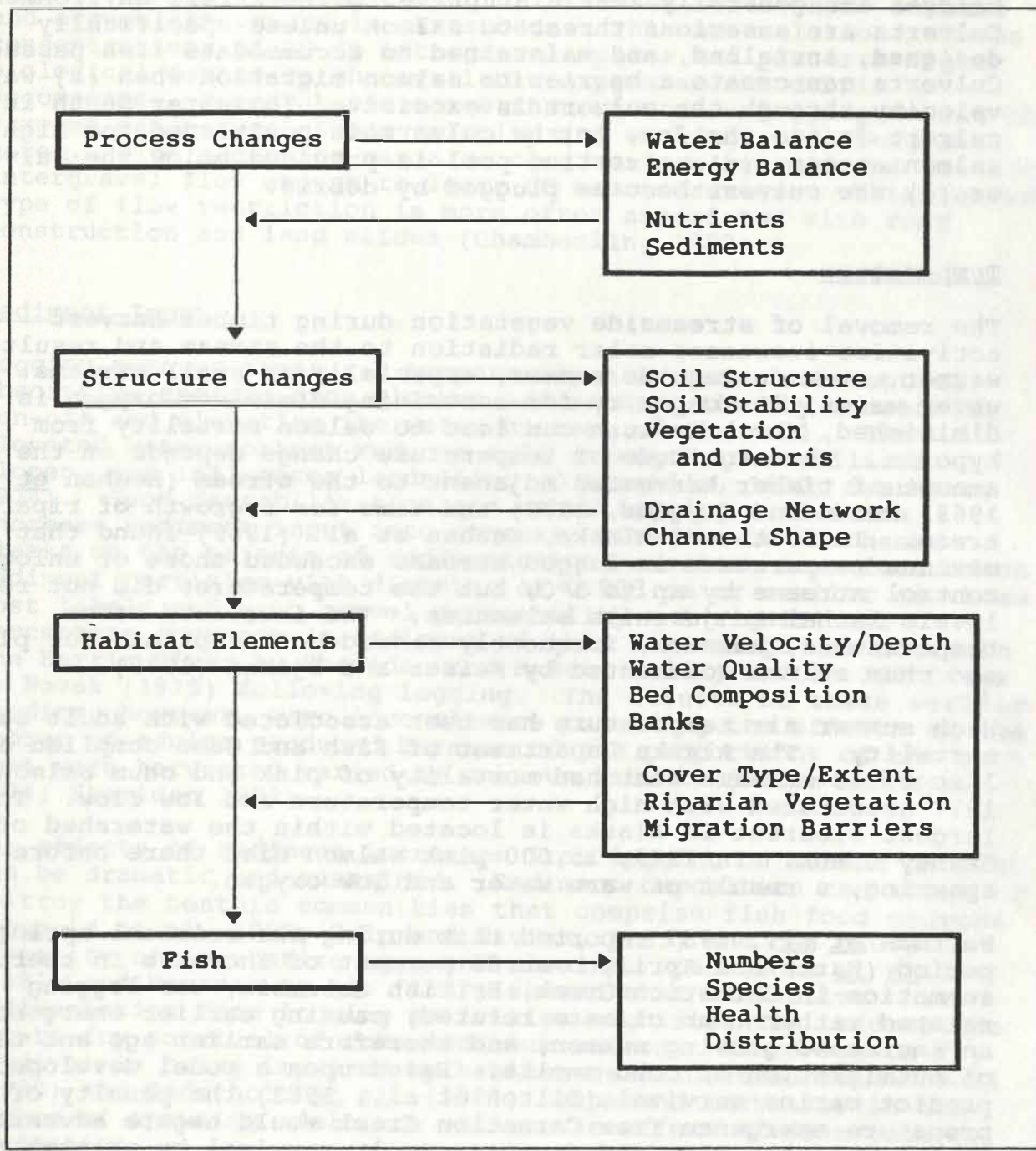


Figure 1. Relations of Timber Harvest to Fish.
(From Chamberlin, 1982)

block fish migration. Culverts are often installed during road construction as an economical alternative to bridges, although bridges are generally less disruptive to the stream environment. Culverts are a serious threat to salmon unless specifically designed, installed, and maintained to accommodate fish passage. Culverts can create a barrier to salmon migration when (a) water velocity through the culvert is excessive, (b) water depth in the culvert is too shallow, (c) the culvert is positioned too high for salmon access, (d) no resting pool is provided below the culvert, or (e) the culvert becomes plugged by debris.

Temperature

The removal of streamside vegetation during timber harvest activities increases solar radiation to the stream and results in warmer water during the summer, especially in small streams. As water warms, its capacity for containing dissolved oxygen is diminished, which in turn can lead to salmon mortality from hypoxia. The magnitude of temperature change depends on the amount of timber harvested adjacent to the stream (Meehan et al., 1969; Brown and Krygier, 1970) and time for regrowth of riparian areas. In Southeast Alaska, Meehan et al. (1969) found that maximum temperature in logged streams exceeded those of unlogged control streams by up to 5°C, but the temperatures did not reach levels lethal to juvenile salmonids. The increased water temperatures, however, frequently exceeded the optimum for pink and chum salmon documented by Reiser and Bjornn (1979).

High summer air temperature has been associated with adult salmon mortality. The Alaska Department of Fish and Game compiled a list of 43 streams that had mortality of pink and chum salmon in 1977 associated with high water temperature and low flow. The largest clearcut in Alaska is located within the watershed of Staney Creek. In 1979, 15,000 pink salmon died there before spawning, a result of warm water and low oxygen.

Hartman et al., 1987 reported that during the critical spring period (March and April) over 80 percent of increase in thermal summation in Carnation Creek, British Columbia, was logging related rather than climate related, causing earlier emergence, an increased growing season, and therefore earlier age and timing of outmigration of coho smolts. Based upon a model developed to predict marine survival (Bilton et al., 1982) the penalty of premature emergence from Carnation Creek would negate advantages of larger smolt size and decrease smolt survival by as much as 15 percent.

In northern areas of Alaska, the removal of riparian vegetation in northern areas may result in lower stream temperatures during winter, increasing the chances of frazil and anchor ice formation (Chamberlin, 1982).

Dissolved Oxygen Concentration

Logging can affect dissolved oxygen (DO) concentrations when organic debris, logging slash, or fine sediments enter streams and accumulate on and in streambeds. This accumulation reduces concentrations of DO in intergravel spaces and places a higher biological demand on the available oxygen as the debris decomposes. Research indicates that excessive logging debris in streams can reduce stream velocity and exchange of intergravel water. Fine sediments can also clog surface gravels and restrict intergravel flow enough to lower DO concentrations. This latter type of flow restriction is more often associated with road construction and land slides (Chamberlin, 1982).

Sediment Input

Logging removes trees and temporarily eliminates substantial absorptive surface area (leaves and roots), thereby increasing run-off and elevating the water content of the soil. The elevated water content reduces soil strength, destabilizes slopes, and influences landslides (O'Loughlin, 1972; Swanston, 1974). Such destabilization and other logging activities increase sediment input into streams. Studies in Southeast Alaska on the effects of sedimentation on salmon have focused on sediment particles with diameter of 0.833 mm or smaller as those most likely reducing gravel permeability. A significant percentage increase in sediment of this size range was noted in the Harris River by Sheridan and McNeil (1968) and in 108 Creek by Novak (1975) following logging. The results of these earlier studies, however, were inconclusive regarding the effects on the number of adults produced because of the proportions of the runs that were harvested varied by unknown amounts (Pella and Myren 1974; Sheridan 1982).

The effects of sediment increases from logging on salmon habitat can be dramatic and sustained. Sediment deposition can alter or destroy the benthic communities that comprise fish food sources (Newbold *et al.* 1980; Culp and Davies, 1983) and can cause mortality of incubating eggs and alevins. Cederholm *et al.* (1981) and Hartman *et al.* (1987) showed that cumulative sedimentation from logging activities significantly reduces the egg-to-fry survival of coho and chum salmon. Where egg-to-fry survival is being impaired by habitat deterioration both McNeil (1980) and Cederholm *et al.* (1981) recommend increases in the number of spawning adults to offset the effect of decreased production.

Conversion to Second-Growth

Converting large portions of old-growth forests to rapidly growing second-growth forests can permanently reduce low summer

stream flows and thus permanently reduce salmonid production (Myren and Ellis, 1984). The studies of streams in second-growth forests have demonstrated that the input of large, potentially stable debris (like logs and stumps) into salmon habitat from second-growth is reduced relative to inputs from old growth stands (Bisson et al. 1987). Further, the initial high productivity of prey organisms in streams running through open canopy (clearcut timber harvested areas) is shortlived and eventually the quality of salmon food organisms declines as the canopy closes (Sedell and Swanson, 1984).

Despite the fact that important questions related to the long-term effects of converting old-growth to second-growth forest remain unanswered, logging to the stream bank continues in Alaska on both public and private lands.

Guideline Discrepancies

The use of different guidelines for timber harvest on private lands has resulted in a major difference in the amount of protection afforded salmonid habitat in Alaska. While the State of Washington has recently implemented more restrictive forest practices legislation governing the logging of private lands, including the requirement for leave strips along streams, Alaska has not. Alaska last revised its statute in 1978. Within the State, the stringency of required practices and the extent of enforcement have afforded salmon habitat varying levels of protection. Where forest practices measures that preserve habitat quality are weak or not enforced, as on private land, salmon habitat may be degraded so much that it no longer can produce salmon.

Salvage Logging

The commercial removal of logs from the channels of the Unuk and Chickamin rivers has resulted in the loss of debris that provides habitat for juvenile chinook and other salmon. The discharge of these glacial rivers varies considerably; too frequently salvage loggers mistakenly consider the high-flow habitat and the large organic debris to be out of the river channel.

D. Mining

Marine mining for gravel and gold

At present, marine 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, particularly intertidal spawning grounds. Neither the future extent of this activity nor the effects of such mortality on the abundance of marine species is known. The demand for gravel is likely to increase as the economy and associated development expand.

Dredging for gold has been attempted at various sites along the Aleutians and a major project presently mines gold with a dredge offshore of the city of Nome. Such activity has the potential to cause physical damage directly and indirectly to benthic habitat and to fish and shellfish during certain life stages. Both the State and Federal governments have recently initiated offshore mineral leasing programs. Portions of the Bering Sea are believed to have mineral potential. There will be increased interest in offshore mining as onshore reserves dwindle or economic value increases.

Riverine and Placer Mining

Gravel and sand are removed from the lower reaches of the Kuskokwim River and throughout the Yukon River system. Sand and gravel extraction operations in these watersheds, which support anadromous fish, are of concern. Such operations can directly disrupt spawning adults and incubating eggs or alevins as well as kill fry, smolts, and adults. Removal can also destabilize upstream and downstream gravels, possibly resulting in indirect mortality to eggs, alevins, fry, and smolts. If bottom contours are not reestablished, extraction pits can trap juveniles and fry as flows drop.

Hydraulic mining for gold has occurred in Alaska and Canada, particularly in the Yukon River system, and the effects on fish habitat were disastrous. These harmful practices, however, have been brought under control for the most part. However, placer mining for gold and associated suction dredging continues to be a problem in interior Alaska streams and Canadian portions of the Yukon River system. In some cases, water is completely diverted from the streambed while gravel is processed. Dredging discharge increases turbidity and sediment. This can result in the loss of production mentioned earlier (Lloyd, 1987). Such sediment pollution, particularly turbidity, is considered by some to be

the most prevalent form of pollution in Alaskan waters (Lloyd, 1987) and has contributed to the absence of grayling in some streams influenced by mining (LaPerriere et al. 1985). While the effects of mining-related turbidity on anadromous salmonids has received little scientific scrutiny, preliminary studies have suggested coho and chinook salmon avoid glacially turbid water in Alaskan rivers (ADF&G, 1983; Shaul et. al 1984) or move into their clearer tributaries, and chinook salmon exhibited faster growth in clear tributaries than a naturally turbid mainstem river (Kissner, 1983).

Lode Mining

Large-scale ore extraction-and-milling operations associated with gold mining are a growing concern, with several projects proposed on transboundary rivers flowing into Southeast Alaska. Cyanide, arsenic, mercury, heavy metals and reagents associated with such development are a serious threat to salmonid habitat. Improper or in-water disposal of tailings may poison salmonids downstream. On land placement of tailings in unstable or avalanche prone areas can cause large quantities of toxic compounds to be released into streams. The potential exists for tailings to contaminate groundwater, an important component of chum salmon spawning habitat, in particular.

Open Pit or Strip Mining

Only one proposal for open pit mining in Alaska has come forward to date, that of a world-class molybdenum mine at Quartz Hill, east of Ketchikan. If this project goes forward, the road building, water supply, and tailings disposal aspects of operating the mine have potential for impact to salmon streams and estuarine habitat.

E. Ocean discharge and dumping.

At present, there are two areas in the Alaska Region where the ocean discharge of nonorganic materials is known to occur on a large scale. Both of the areas are disposal sites for dredged material 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. Similar proposals for marine dredging have been proposed for south central and southeast Alaska.

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 are known to occur in marine bottom sediments. The levels of this heavy metal in Norton Sound (Nelson *et al.*, 1975) 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 in eastern Norton Sound will result in the discharge and resuspension of sediments that could introduce mercury to the water column.

Accumulation of heavy metals in fish occurs naturally, 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.

F. Derelict fragments of fishing gear and general litter.

Persistent plastic debris is introduced into the marine environment from offshore vessels and commercial fisheries as well as from general shoreside activities. The debris includes synthetic netting, pots, longline gear, packing bands, and other material. 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 has been discarded incidentally to net repair activities. Such deliberate discharges are now prohibited (Act to Prevent Pollution from Ships, 33 U.S.C. 1901 et seq.).

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. Debris may cause mortality of marine fish and shellfish, marine mammals, and birds that become entangled in or ingest it. Derelict monofilament gillnet, such as that used on the high seas for salmon and squid, might continue to kill and waste fish, including salmon. Other discarded gear, such as lost pots, continues to fish unattended for varying lengths of time. Neither the extent of debris-related mortality nor the effects of such mortality on the abundance of various salmon species is known at this time.

G. Dams and Impoundments

Dams usually have detrimental effects on salmon and their habitat. The transformation of a river from its natural free-flowing state to an impoundment fundamentally alters that environment, and, as mentioned, may cause declines of salmon runs in affected river basins.

Dams are a significant barrier to upstream and downstream migrations of salmon, and have probably caused the greatest loss of salmon habitat due to human activities in the lower 48 states. Dependence upon technology to provide passage around dams has seldom been successful.

Where upstream fish passage facilities have been provided, migration delays and increased mortality of adults persist. Fishway design and flow are very important to attract and guide adult salmon into passage facilities. Poorly designed fishways can inhibit movement of adults upstream, causing migration delays, increased pre-spawning mortality, and reduced reproductive success of the fish that eventually reach their spawning grounds (U. S. Bureau of Reclamation, 1985; Hallock et al., 1982).

Dams also present obstacles to downstream passage of juveniles and passage through turbines or over spillways can result in migration delays, increased predation, and direct mortality.

For the most part, major adverse effects to salmon stocks and habitat caused by dams have been avoided or mitigated in Alaska, as managers have learned from mistakes made on the Columbia River and elsewhere in the lower 48 states. For a more complete discussion of effects of dams on salmon and salmon habitat, we recommend the Habitat Appendix of the Eighth Amendment to the Fishery Management Plan for Commercial and Recreations Salmon Fisheries off the Coasts of Washington, Oregon, and California Commencing in 1978 (PFMC, 1987).

H. Urbanization, Pollution, and Coastal Development

Urbanization and associated coastal development can have a pronounced effect on coastal ecosystems through modification of the hydrography, biology, and chemistry of rivers, lakes, bays, and estuaries. The inland freshwater and coastal wetland areas that have been and continue to be filled, drained, or otherwise modified, are areas of widespread ecological significance. In addition to providing valuable spawning, rearing, and food production areas for salmon, wetlands store runoff (thereby reducing floodpeaks) and filter nutrients and pollutants from runoff, and wetland vegetation reduces shoreline erosion. It is

generally acknowledged their conversion has had severe impacts on fish as well as other species dependent on wetland areas.

The removal and relocation of river, harbor, and coastal sediments are often conducted for maintenance of channels for navigation and port facilities. Sediment excavated in maintenance dredging may be contaminated with a wide variety of wastes, notably heavy metals, that have been spilled, discharged or otherwise entered the waterway (Kester et al., 1983). Dredging results in increased turbidity temporarily, with the effects being dependent on the type of substrate being dredged, on currents or tides, on preventive measures, type of dredge employed by the contractor, and duration of the dredging. Suspended solids from dredging and filling activities or riverine sources can also directly kill or injure salmonids by clogging and coating gill filaments, by causing abrasive injuries, or by being a source of toxic components (Mortenson et al., 1976). While these effects can be temporary, long-term habitat degradation can result when dredging resuspends pollutants that had settled in the sediment, disrupts benthic communities, or causes loss of shallow water habitat.

Filling often occurs as part of dredging operations for residential, industrial, and agricultural purposes. Filling and related alteration of estuarine habitat and freshwater wetlands has historically been unregulated resulting in adverse impacts to salmonid habitat, particularly in estuaries near urban areas such as Anchorage and Ketchikan. Overall, in Alaska between 1981 and 1985, filling of 7,660 acres of coastal wetland (including 389 acres of estuarine fill) were authorized by the U.S. Army Corps of Engineers individual permitting program (Faris, et al., 1987). This estimate does not include acreage filled through general or nationwide authorization. Obtaining dry land by filling, diking, or draining of stream side channels, sloughs, and other inland and estuarine wetland areas destroys forever major important salmon habitat.

In some coastal areas, shallow waters require construction of long structures projected seaward 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 marine organisms in the area. Without special considerations these facilities could affect tidal flushing, water temperatures, water quality, and access by fishes.

Prior to the strengthening of environmental controls in the 1960's, rivers, streams, lakes, and estuaries were the receiving waters for vast volumes of untreated organic and industrial wastes. The major forms of pollution affecting Pacific salmon included raw sewage, pulp mill effluents, and acid and metal wastes. Severe environmental damage from uncontrolled waste discharge was evidenced by fish kills, oxygen depletion, massive

blooms of nuisance algae, and public health problems. Regulation of municipal and industrial discharges have improved the situation, but impacts of urbanization and pollution remain a major threat to anadromous fish.

The introduction of foreign materials into waterways causes serious habitat degradation. Sewage, wood processing wastes, and agricultural run-off, and other oxygen-demanding materials reduce oxygen levels, and can create oxygen poor zones that delay or block migration of salmon. Heavy metals, petroleum hydrocarbons, chlorinated hydrocarbons, and other chemical wastes can be toxic to salmonids, or their food, or inhibit their movement in streams. There is growing evidence that some organic-metal compounds, like those used in marine antifouling paints, are extremely toxic to salmon (Short and Thrower, 1986) and some have recently been banned for most uses. Mining operations often produce heavy metals as waste products. There is evidence that these substances may modify the movement of salmon, causing migration delays (Damkaer and Dey, 1985). Other degradations in estuarine water quality, such as low oxygen or high waste levels may force juveniles into areas where they are subjected to increased predation. Degraded water quality has been associated with mortality of adult salmon in areas such as Ward Cove near Ketchikan (Viteri and Kruse, 1987). Environmental perturbations associated with suburban residential development, including habitat alteration, increased stream nutrient loading, and degradation of the intergravel environment, have the potential to result in the loss of freshwater coho salmon rearing habitat (Scott, 1986).

I. Mariculture

Mariculture (or aquaculture) should be considered a potential habitat threat. Tremendous interest in legislation favorable to finfish (primarily salmon) cage culture and other mariculture has raised concerns about threats to existing salmon resources and habitats. For the most part, these concerns are speculative but are not unfounded, based on experiences with cold water marine mariculture in other countries (Faris, 1987). Foremost is the threat of overenrichment of marine waters and benthic habitat by uneaten food, feces, or other organics. Accumulations of such material on the bottom have created anaerobic conditions near mariculture sites as well as degrade foraging areas and habitat of early ocean salmon (Philips et al., 1985). Threats also exist from introductions of exotic species or domestic strains, which might prey upon, compete with, or interbreed with wild stocks.

Other threats to the natural salmon stocks are the spread of disease from culture facilities and development of physical ancillary facilities such as access roads, floating processing

plants, or caretaker residence facilities (i.e., increase in untreated sewage). At this time there is a tremendous need for more information and careful study of pilot mariculture projects slated by the State of Alaska.

VI. MAINTENANCE OF PRODUCTIVE CAPACITY

A. General

Abundant, good quality habitat for salmon migration, spawning, and rearing is a prerequisite to maintaining healthy salmon fisheries and associated industries. Productive habitat continues to be threatened, however, by pressures from a variety of competing land and water uses. Individual impacts as well as cumulative impacts of water resource developments on the habitat of Pacific salmon can be devastating. Maintaining the productive capacity of salmon habitat is the goal of a number of State and Federal laws that regulate activities in anadromous fish streams and watersheds. In many instances, these laws have reduced impacts on quality and quantity of salmon habitat by controlling or curtailing harmful activities. In other cases, however, weak enforcement or inadequate implementation has allowed damaging activities to persist.

The following sections describe (1) Federal legislative programs, portions of which are particularly directed to or related to the protection, maintenance, or restoration of the habitat of living marine resources; and (2) specific actions taken by the Council and NMFS for the same purpose.

B. Legislation

Introduction

This section summarizes the Federal legislative programs and responsibilities related to protection of salmon habitat. The Department of Commerce (DOC) is responsible for protecting living marine resources and their habitats under a number of Congressional authorities that call for varying degrees of interagency participation, consultation, or review. A potential for further Council participation exists wherever Federal review is required or encouraged. In some cases, State agencies may share the Federal responsibility.

Magnuson Fishery Conservation and Management Act (Magnuson Act).

This Act provides for the conservation and management of U.S. fishery resources within the U.S. Exclusive Economic 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 Fishery Management Council is charged with developing fishery management plans (FMPs), FMP amendments, and regulations for the fisheries needing conservation and management within its geographical area of authority. FMPs must be developed in consideration of habitat and habitat-related problems as well as other factors relating to resource productivity. After approval of FMPs or FMP amendments, NMFS is charged with their implementation.

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) processes ocean dumping permits, Federal Energy Regulatory Commission processes hydroelectric power project proposals, and Department of the Interior (DOI) processes Outer Continental Shelf (OCS) oil and gas and mineral leasing activities, among others.

National Environmental Policy Act of 1969 (NEPA).

NEPA requires that 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, decision making and administrative actions, and that the public is provided adequate opportunity to review and comment on the major Federal actions. An Environmental Impact Statement (EIS) or environmental assessment for a finding of no significant impact is prepared for FMPs and their amendments. NEPA requires preparation of an EIS only for major Federal actions that significantly affect the quality of the human environment; an environmental assessment is sufficient if it justifies a finding of no significant impact (FONSI). NMFS reviews EIS's and provides recommendations to mitigate any expected impacts to living marine resources and habitats.

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.

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.

Endangered Species Act of 1973 (ESA).

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.

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. The Alaska Coastal Management Act requires consistency of all state and local governments with the Alaska coastal management program and any subsequent district programs. Under present policy, FMP's undergo consistency review. Alaska's State coastal management program contains a section on standards for coastal development, energy facilities, mining and mineral processing, and water quality which gives the State the ability to influence the location and design of activities which may affect fishery habitat. District coastal management programs may incorporate more specific habitat protection requirements for marine areas. 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.

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.

Outer Continental Shelf Lands Act of 1953, (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, 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.

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 site, 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.

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.

Salmon and Steelhead Conservation and Enhancement Act (SSCEA).

Enacted in 1980, the SSCEA was designed to complement the Northwest Power Act and established the Salmon and Steelhead Advisory Commission, which recommended a new structure to: (1) improve management and enhancement planning and coordination in Washington and Oregon; (2) facilitate resolution of disputes between management entities concerned with stocks of common interest; (3) prepare comprehensive resource production and management plans; and (4) coordinate enforcement efforts.

The Commission's 1984 report containing the above recommendations has not yet been approved by the Secretary of Commerce, due in part to funding uncertainties. The recommendations put forward by the Commission to accomplish its mandate under the Act have, therefore, not been fulfilled or implemented, nor have any benefits to the resource from this potentially valuable enhancement tool been realized.

Anadromous Fish Conservation Act (1965)

Passed by Congress in October 30, 1965, this act was designed to conserve and enhance the Nation's anadromous fish resources and encourage joint research and development projects between state and federal governments.

C. Specific actions taken by the Council and NMFS related to salmon habitat.

The Council or NMFS have already taken the following actions to protect salmon habitat:

(a) Established 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) Established ocean troll salmon seasons, legal gear, a minimum length limit and total harvest limits for chinook, and sport bag limits.

(c) established other management measures that act to allow for contingencies in the condition of the stock, such as the establishment of maximum sustainable and optimum yield levels, limited entry, inseason adjustments of fishing times and areas, reporting requirements, and gear placement and modifications.

(d) Provide recommendations to permitting agencies regarding subtidal oil lease sales. NMFS has made recommendations 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.

D. Nonregulatory Techniques to Address Identified Habitat Problems

Several "real time," nonregulatory type actions or strategies are available to the Council for addressing its habitat concerns. Any actions it takes must be consistent with the goal and objectives of the FMP. The following list are some of the actions the Council may wish to take in the future, based on the concerns expressed and data presented or referenced in this FMP:

(a) Hold hearings to gather information and concerns related to specific proposed projects having a potentially adverse effect on salmon habitat in fresh, estuarine and marine waters.

(b) Write comments to regulatory agencies during project

review periods to express concerns or make recommendations about issuance or denial of particular permits.

(c) Respond to "Calls for Information" from the Mineral Management Service (MMS) regarding upcoming oil and gas lease areas affecting salmonid habitat in the Alaska Region.

(d) 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.

(e) Establish review panels or an ad hoc task force to coordinate or screen habitat issues. Participate in State and Federal task forces which review habitat issues and recommend research direction.

(f) 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.

(g) Join as amicus curiae in litigation brought in furtherance of critical habitat conservation, consistent with FMP goals and objectives.

VII. RESTORATION/ENHANCEMENT OF SALMON RESOURCES IN ALASKA

Loss of salmon habitat is not something that has occurred only in the past, it is continuing. The threats of oil and gas development, logging, mining, etc., can directly and adversely effect salmonid habitat and resources on a large scale, the end result being the endangerment of the commercial salmon fishing industry and placing the future of the salmon resource at risk. Alaska is the world's major salmon producer primarily because the quality and quantity of habitat which remains in production. We know enough about salmon habitat, in particular freshwater requirements, to know what is needed to maintain habitat, and therefore sustain the returns upon which one of Alaska's biggest industries is based. Other industries using nonrenewable resources (e.g., minerals) and those which can be harvested only every hundred years or so (e.g., trees) must not be allowed to subordinate salmon habitat upon which a well established, unsubsidized commercial industry, growing recreational fishing industry, and unique culture depends. Fortunately, the involvement of Aquaculture Associations, fishermen, and persons in conservation and restoration efforts have built a constituency in Alaska with political strength devoted to averting these threats.

Many of the mistakes made that degraded habitat elsewhere can be and must be avoided. Mitigation efforts have seldom lived up to their promise of restoring the productivity of the habitat it replaced. The costs of restoration are great as has been learned on our national forests in the lower 48 states. Habitat protection needs to be given the highest priority, followed by enhancement, restoration and mitigation in that order. While the following enhancement techniques have been used in Alaska, there is no substitute for careful management of harvests and spawning escapements and protection and maintenance of existing salmon habitat.

The Alaska Department of Fish and Game, Fisheries Rehabilitation and Enhancement Division (FRED) was established by the State Legislature in 1971 to encourage the use of enhancement techniques to return the State's then depressed salmon fisheries to abundance. FRED coordinates the development of regional aquaculture associations, administers the Private Nonprofit (PNP) Hatchery Program, approves annual operations management plans for all salmon hatcheries, and reviews PNP hatchery applications and the permitting process (which includes hatchery and fish transporting permits). Currently there are seven regional aquaculture associations in the State of Alaska:

Cook Inlet Aquaculture Association (CIAA)
Lower Yukon/Kuskokwim Regional Aquaculture Association
(LYKRAA)

Northern Southeast Regional Aquaculture Association (NSRAA)
Prince William Sound Aquaculture Association (PWSAC)
Southern Southeast Regional Aquaculture Association (SSRAA)
Imparik Regional Aquaculture Corporation (IRAC)
Kodiak Regional Aquaculture Association (KRAA)

A number of cost-effective, innovative approaches to expansion and enhancement of salmonid habitat have taken place in Alaska. These include the following nine approaches, which are presented with examples.

A. Barrier Removal - The USFS has created access to an additional 2500 acres of stream habitat through the removal of migration barriers and placement of fish ladders (Personal communication, Bob Dewey, USFS). ADF&G has installed 23 fish passages (several maintained in cooperation with the USFS) to provide access to spawning and rearing habitat that would otherwise be unavailable to salmon stocks.

B. Barrier Lake Rearing - an active and successful coho barrier lake rearing program where fishless lakes or lakes inaccessible to adult salmonids are planted with coho fry. Fish rear, generally out-migrate at a large size, and provide substantial returns to the commercial fishery. Northern Southeast Regional Aquaculture Association (NSRAA) and NMFS have pioneered this approach. From initial full scale production in 1984 to 1987, NSRAA barrier lake rearing programs have contributed total returns of 38,500 coho with over half of these going to the commercial fishery. By the early 1990's total returns are projected to average greater than 43,000 per year (Personal communication, D. Crone, NSRAA). Other aquaculture associations have initiated lake rearing projects and NMFS has done experimental work on chinook lake rearing.

C. Lake Fertilization - ADF&G and Prince William Sound Aquaculture Association have successfully used lake fertilization to increase returns of sockeye salmon and ADF&G has initiated a five year lake fertilization effort on Redoubt Lake near Sitka. The U.S. Forest Service and the Alaska Department of Fish and Game (Fisheries Rehabilitation, Enhancement, and Development Division) are usually cooperating agencies in enhancement efforts by Aquaculture Associations.

D. Spawning Channels - Two successful chum salmon spawning channels have been constructed in southeast Alaska by NSRAA and the USFS. First used by spawners in 1983, the Chilkat River channel has performed well with high egg to emergence survival. In 1987, its first year for adults of channel origin, 5,000 chums returned. The USFS spawning channel at Hyder has been used by spawners for the past two years but returns from fish spawned there are expected in 1988.

E. Incubation Boxes - SSRAA, ADF&G, and other have initiated incubation box programs. ADF&G has developed a hatchbox program which combines unique groundwater sources and underutilized lake rearing habitat to increase sockeye returns to the Copper River by an estimated 85,000 to 100,000 total adults in 1986 and 1987 (Ken Roberson, personal communication). By 1990, total catch and escapement of sockeyes originating from the project is projected to exceed 250,000. PWSAC is a cooperator.

F. State Hatcheries - The cornerstone of Alaska's hatchery enhancement effort is the system of public and private nonprofit (PNP) salmon hatcheries which are designed to augment the state's natural runs. About 17.1 million adult salmon returned to the state in 1985 from hatchery releases in previous years. The goal of the State ocean-ranching program is to produce 25 million adult salmon for harvest.

FRED division itself currently operates 20 hatcheries which produce salmon and trout for subsistence, commercial and sport fisheries.

G. Private Nonprofit Hatcheries - The Private Nonprofit (PNP) Hatchery Program was created in 1974 by the legislature to provide private sector participation in rebuilding Alaska's depleted salmon fisheries. The impetus for the program came from the desire of commercial fishermen to enhance the severely depressed salmon stocks of the early 1970s (Allee, 1987). The statutes for Private Nonprofit Salmon Hatcheries (Alaska Statute 16.10.375-620 passed in 1974) authorized the Alaska Department of Fish and Game, FRED to issue hatchery permits to qualified PNP corporations. In 1976, the legislature authorized the formation of regional aquaculture associations. Regional associations are comprised of representatives of commercial fishermen and other user groups in the region, including sport fishermen, processors, subsistence fishermen and members of local communities (Greenberg, 1983). Each regional association must have a board of directors consisting of at least one representative from each user group within the association.

H. Regional Planning Teams - Three representatives from each regional association are appointed by their respective boards of directors to serve on a regional planning team (RPT) along with three Alaska Department of Fish and Game (ADF&G) personnel. These teams are responsible for developing regional comprehensive salmon plans for both FRED and PNP hatchery production.

To date, 29 PNP hatchery permits have been received by FRED. There are presently 17 operational PNP hatcheries (eight regional association hatcheries and nine nonassociation hatcheries). Six hatcheries are classified as not operational (of these one permit has been given up). The remaining six PNP hatcheries are

somewhere in the permit process. Nonassociation operations do not have representatives on the regional planning team, and thus, no direct role (other than public comment) in setting harvest goals. Permits for nonassociation hatchery production capacity are reviewed by the RPT for consistency with planning goals.

I. Other Efforts - Include enhancement research efforts at the NMFS's Little Port Walter field station and Auke Creek Hatchery, and production hatchery at Metlakatla, owned and operated by the Metlakatla Indian Community.

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VIII. RESEARCH INFORMATION NEEDS

The following are some research and information needs which are pertinent to the continued maintenance and management of salmon habitat in Alaska.

- A. Evaluate the productivity of salmon rearing streams associated with second-growth riparian habitat.
- B. Determine the best design and dimensions of unlogged streamside buffer strips for habitat protection.
- C. Determine the relationship of large organic debris (LOD) to salmon spawning habitat.
- D. Assess the effects of mariculture on salmon populations and salmon habitat.
- E. Assess the relative importance of quantity and quality of estuarine habitat to production and returns of adult salmon.
- F. Assess the effects of estuarine log storage on salmon habitat.
- G. Assess the effects of timber harvest and related sedimentation on lacustrine salmonid habitat.

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APPENDIX F.

ENVIRONMENTAL ASSESSMENT

AND

REGULATORY IMPACT ASSESSMENT/INITIAL REGULATORY FLEXIBILITY ANALYSIS

FOR THE THIRD AMENDMENT OF THE

FISHERY MANAGEMENT PLAN FOR THE HIGH-SEAS SALMON

OFF THE COAST OF ALASKA

Prepared by the Salmon Plan Team
and the staffs of the
Alaska Region, National Marine Fisheries Service
and North Pacific Fishery Management Council

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SUMMARY

These assessments evaluate the probable impacts associated with the draft third amendment (revision) of the Fishery Management Plan for the High Seas Salmon Fishery off the Coast of Alaska (plan or FMP). The draft third amendment involves two issues for the Council's review and action. The Council believes the third amendment is necessary because of four situations: (1) the process for managing the fishery changed with the signing of the Pacific Salmon Treaty, (2) the scientific data contained in the plan had become outdated and there were some errors in the existing plan the Council wanted corrected, (3) amendments of the Magnuson Act required FMPs to consider fish habitat and vessel safety, and (4) the process for regulating the troll fishery needed to be streamlined to make it more timely and reduce confusion. In addition, the Council wanted to consider extending the jurisdiction of its plan to the EEZ west of 175° East Longitude.

Proposed Changes and Issues for Council Consideration

The draft third amendment makes several changes to the existing fishery management plan. It changes the name of the plan, and condenses and reorganizes it. It updates and corrects the text and tables, and brings the plan into conformity with the Pacific Salmon Treaty and recent amendments of the Magnuson Act.

The draft amendment also contains two issues for the Council's consideration:

(1) Extend the jurisdiction of the plan over the EEZ west of 175° east longitude.

(2) Streamline and speed up the process for regulating the salmon fisheries. Two alternatives to the present process are proposed: (a) delegate regulatory authority to the State and (b) maintain the present process, maybe with a faster way for NMFS to notify fishermen of regulations and changes to regulations.

Environmental Assessment

The Environmental Assessment (EA) shows that implementing the proposed amendment will have no significant impacts on the human environment. The proposed changes are primarily of style and structure of the fishery management plan, rather than with the way the fisheries are actually managed. The parts of the draft amendment that deal with management of the fisheries (e.g.

deferring regulatory authority to the State of Alaska, for vessels registered under Alaska law) will, by themselves, have little, if any, effect on the human environment.

The only significant impact to the human environment that might result from provisions in the draft third amendment relate to the issue of extending the plan's jurisdiction over the EEZ west of 175° east longitude. Those potential impacts, however, are independent of the third amendment and, therefore, are not appropriately attributed to the proposed action. They are, instead, dependent upon the existence of the International North Pacific Fisheries Commission (INPFC) and actions of the Japanese high-seas salmon mothership fisheries.

If the INPFC were abolished and not replaced and the Council extended the plan's jurisdiction and excluded the Japanese mothership fishery from harvesting salmon in the U.S. EEZ, then those decisions might lead to serious environmental impacts to salmon, marine mammals, marine birds, and other marine species, depending upon how the Japanese mothership fishery reacted to those decisions.

Regulatory Impact Review/Initial Regulatory Flexibility Analysis

The Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA) shows that the rule implementing the proposed third amendment will not be a major rule under Executive Order 12291 (E.O. 12291) nor will it, by itself, have a significant economic impact on a substantial number of small entities, as defined by the Regulatory Flexibility Act (RFA). The impacts from streamlining the regulatory process will likely be slightly lower Federal management costs and provide slightly increased benefits to the fishermen in the form of more timely notices and less confusion about the regulations. The impacts, if any, from extending the jurisdiction of the plan over the EEZ west of 175° East Longitude will depend upon whether the International Convention for the High Seas Fisheries of the North Pacific Ocean remains intact and how the Japanese conduct their high-seas salmon gillnet fisheries.

(This document was prepared by the salmon plan team of the North Pacific Fishery Management Council and the staffs of the Alaska Region, National Marine Fisheries Service, and the North Pacific Fishery Management Council.)

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1.0 ASSESSMENT OF THE PROBABLE ENVIRONMENTAL IMPACTS OF THE PROPOSED AND ALTERNATIVE ACTIONS.

1.1 INTRODUCTION

The need for amending the plan and the alternatives considered by the Council are contained in a separate document (NPFMC, 1989a). Most of the proposed amendment (NPFMC, 1989b) deals with the style and structure of the document, rather than with the provisions of the fishery management plan. Those stylistic changes have no impact on the human environment. The Council on Environmental Quality defines "human environment" to mean "the natural and physical environment and the relationship of people with that environment" and excludes purely economic or social factors (40 CFR 1508.14).

The parts of the third amendment that deal with the provisions of the FMP will, by themselves, have little, if any, effect on the human environment. The impacts from any Council action relating to the western boundary of the jurisdiction of the plan are dependent upon future decisions and actions by the United States and Japan in connection with the International Convention on the High Seas Fisheries of the North Pacific Ocean, the International North Pacific Fisheries Commission, and the Japanese high-seas mothership salmon fishery.

1.2 ASSESSMENT OF THE ENVIRONMENTAL IMPACTS

1.2.1 Impacts of Extending Council Jurisdiction over the EEZ West of 175° East Longitude.

If the Council decides to extend the jurisdiction of the plan over the EEZ off Alaska west of 175° East Longitude, that action will, by itself, have no environmental impacts as long as the INPFC remains intact. The international treaty will have precedence, and the Council's extended jurisdiction will cause no change in the existing fisheries or the amount of salmon harvested or marine mammals and sea birds killed. The Council's decision, however, would allow the domestic sport fishery to enter this additional portion of the EEZ, but that is unlikely, given the remoteness of the area.

Any measurable environmental impact will depend upon what the United States, Canada, and Japan do in connection with the International Convention for the High Seas Fisheries of the North Pacific Ocean, or possible bilateral agreements between the United States and Japan regarding the Japanese high-seas mothership salmon fishery, or other possible international agreements (see §2.3.1 of this document for a discussion of economic considerations, and §5.1 of the "Needs and Issues" paper (NPFMC, 1989a) for more details).

The potential impacts on the human environment are independent of this current amendment of the salmon plan and, therefore, are not appropriately attributed to the proposed action. They depend entirely on how Japan would conduct its mothership salmon fishery in international waters.

1.2.2 Impacts of Revising the Means of Regulating the Fisheries.

Revising the procedures for regulating the fisheries will have no measurable impacts on the human environment. It could increase slightly the cost of fishing, depending upon which alternative the Council adopts (see §2.3.2 of this document for a discussion of the economic impacts and §5.2 of the "Needs and Issues" paper (NPFMC, 1989a) for details), and it would ensure a greater uniformity of fishing regulations for State of Alaska waters and the EEZ and a reduction of confusion among the fishermen as to whether State or Federal regulations applied.

1.2.3 Impacts of the Proposed Amendment on Marine Mammals.

The only part of this proposed amendment that could be related to changes in impacts on marine mammals is the consideration of extending the jurisdiction of the plan over the EEZ west of 175° east longitude. And those proposed impacts are dependent upon the existence of the INPFC (or equivalent international agreement) and are independent of the proposed amendment of the salmon plan and, therefore, are not appropriately attributed to the proposed action.

The only change to the status quo would come about if there were also a change in the operation of the Japanese high-seas mothership fishery for salmon, and that change would be independent of this amendment; it depends upon the existence of the INPFC, possible other international agreements, and actions by Japanese salmon fishermen in international waters. The probable impacts of the Japanese mothership fishery on marine mammals, sea birds, and salmon are discussed in the Final Environmental Impact Statement and Economic Impact Analysis of the Incidental Take of Dall's Porpoise in the Japanese Salmon Fishery (NMFS, 1987) and are summarized in §5.1 of the "Issues and Needs" paper (NPFMC, 1989a).

1.2.4 Impacts of the Proposed Amendment on Flood Plains, Wetlands, Trails, and Rivers.

Section 02-12 of the NOAA Directives Manual implements NOAA policies and procedures for implementing Executive Orders 11988 and 11990. Part 7 of NDM 02-12 requires the responsible program official to review the applicability of the directive to any proposed action and determine whether the action is located in a floodplain or wetland. NOAA guidelines for the fishery management plan process (Phase II, §5.1.4) specify that an EA

must contain an assessment of whether the action significantly and adversely affects flood plains or wetlands and trails and rivers listed, or eligible for listing, on the National Trails and Nationwide Inventory of Rivers.

The Regional Director, NMFS Alaska Region, has determined that this amendment of the salmon FMP (because it applies only to the EEZ off the coast of Alaska) will have no significant impact on flood plains, wetlands, trails, or rivers.

1.3 JUSTIFICATION FOR AN EA RATHER THAN AN EIS.

1.3.1 NOAA Requirements, Procedures, and Criteria.

The NOAA Directives Manual (NDM) establishes NOAA procedures for implementing the National Environmental Policy Act of 1969 (NEPA). Section 20, Chapter 10 (NDM 02-10), Appendix b, provides specific guidance for fishery management plans and amendments. This directive requires that either an environmental impact statement (EIS) or an environmental assessment (EA) be prepared for any amendment of a fishery management plan. If a proposed plan amendment will or may cause a "significant" impact on the human environment, then preparation of an EIS is required; otherwise an EA is required.

An EA is a concise public document that presents sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact (40 CFR 1508.9). Its purpose is to determine whether significant environmental impacts could result from a proposed action; if so, an EIS must be prepared.

An EIS provides a full and fair analysis of significant environmental impacts and informs decision makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment. It serves as an action-forcing device to insure that the policies and goals defined in NEPA are infused into the ongoing programs and actions of the Federal Government (40 CFR 1502.1)

A NOAA agency may prepare an EA for an amendment of a fishery management plan, rather than an EIS, if it reasonably expects that the proposed action is unlikely to have any of the following five environmental consequences (NDM 02-10 (13(b)), also see 40 CFR 1508.27):

- (1) jeopardize the long-term productive capability of any fish stocks;
- (2) allow substantial damage to the ocean and coastal habitats;
- (3) have a substantial adverse impact on public health or safety;

- (4) affect adversely an endangered or threatened species or a marine mammal population;
- (5) result in cumulative adverse effects that could have a substantial effect on the target resource species or any related stocks.

A NOAA agency must also consider whether the proposed action will likely cause any significant controversy or socio-economic effects.

1.3.2. Analysis of the Third Amendment for Consistency with NOAA Criteria.

1.3.2.1. Will the Proposed Third Amendment Jeopardize the Long-term Productive Capability of any Fish Stock?

No. The the fisheries governed by this plan harvest almost exclusively five species of Pacific salmon (chinook, coho, pink, sockeye, and chum). A few other fish species are incidentally caught but in such low numbers as to be insignificant in terms of the long-term productivity of those stocks. For Pacific salmon, the objectives of the Council's fishery management plan, the provisions of the Pacific Salmon Treaty, the provisions of the International Convention for the High Seas Fisheries of the North Pacific Ocean, and the policies of the Alaska Board of Fisheries all serve to ensure that the long-term productivity of the salmon stocks are not jeopardized; in fact, they act to ensure that the fisheries harvesting salmon are managed for the long-term optimum production from the salmon stocks.

1.3.2.2. Will the Proposed Third Amendment Allow Substantial Damage to the Ocean and Coastal Habitats?

No. The third amendment, by itself, has no impact on the ocean and coastal habitats. In terms of actual fishing operations, which might affect ocean and coastal habitats, it maintains the status quo. The new appendix to the draft revised plan on habitat (NPFMC, 1979c) discusses the Council's concerns on salmon habitat.

1.3.2.3. Will the Proposed Third Amendment Have a Substantial Adverse Impact on Public Health or Safety?

No. The third amendment actually has a slight beneficial impact upon public health and safety by amending the plan to incorporate explicitly an objective for vessel safety (§4.3).

1.3.2.4. Will the Proposed Third Amendment Affect Adversely an Endangered or Threatened Species or a Marine Mammal Population?

No. By itself, this third amendment has no effect on endangered or threatened species or a marine mammal population. It maintains the status quo. (Other possible actions that would overlap with one provision of this third amendment might have some adverse impacts on endangered species, marine mammal, and seabird populations; see §1.2.)

[Since this document was submitted to the Council, NMFS (on 5 April 1990) issued an emergency rule to add the Steller sea lion to the list of Threatened Species under the Endangered Species Act. The Alaska salmon troll fishery is classed as a Category 2 fishery, not because marine mammals are caught by trollers, but because some trollers use firearms to drive sea lions away from their gear. The emergency rule will remain in effect until 31 December 1990, but NMFS intends to have permanent regulations in place before the emergency rule expires.]

1.3.2.5. Will the Proposed Third Amendment Result in Cumulative Adverse Effects that Could Have a Substantial Effect on the Target Resource Species of Any Related Stocks.

No. As far as having effects on target species and related species (in terms of taxonomy, food web, or environment), this amendment maintains the status quo.

1.3.2.6. Will the Proposed Third Amendment Likely Cause any Significant Controversy or Socio-economic Effects?

No. None of the possible parts of this amendment would cause any significant controversy or socio-economic effects. If the Council defers regulatory authority to the State of Alaska, that action will provide socio-economic benefits by allowing fishermen to be notified earlier of inseason changes to the regulations, by eliminating any inconsistencies between the regulations for the fisheries in the EEZ and those in State of Alaska waters (and the resulting confusion among fishermen and enforcement officers), and by reducing the amount of Federal paperwork, including particularly the number of pages in the FEDERAL REGISTER. See §5.2 of the "Needs and Issues" paper (NPFMC, 1989a) for details.

1.3.3. Conclusion.

The Regional Director, Alaska Region, National Marine Fisheries Service has determined on the basis of the analyses presented in this document that the third amendment of the Fishery Management Plan for the High-Seas Salmon Fisheries off

the Coast of Alaska East of 175° East Longitude can reasonably be expected to cause any of the five listed criteria to be met, nor is it likely to cause any significant controversy or socio-economic effects. Therefore, he has determined that this EA is the appropriate environmental document for this proposed Federal action.

1.4 FINDING OF NO SIGNIFICANT IMPACT

For the reasons discussed in this Environmental Assessment, implementation of either the status quo or the plan as revised by the proposed third amendment will not significantly affect the quality of the human environment; thus, the preparation of an environmental impact statement on the final action is not required by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

Assistant Administrator for Fisheries

Date

2.0 REGULATORY IMPACT REVIEW/INITIAL REGULATORY FLEXIBILITY ASSESSMENT

2.1. INTRODUCTION

The Regulatory Flexibility Act requires agencies to prepare an initial regulatory flexibility analysis (IRFA) and make it available for public comment "Whenever an agency is required by section 553 of this title [5 USC], or any other law, to publish general notice of proposed rulemaking for any proposed rule . . ." (§603(a)).

The National Marine Fisheries Service requires a Regulatory Impact Review (RIR) for all regulatory actions that are of public interest. NOAA guidelines for the fishery management plan process (§5.3) allow the IRFA to be combined with the draft RIR.

The RIR does three things: (1) provides a comprehensive review of the level and incidence of impacts associated with a proposed or final regulatory action, (2) provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problem, and (3) ensures that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost effective way.

The RIR also serves as the basis for determining whether any proposed regulations are major under criteria provide in Executive Order 12291 (E.O. 12291) and whether the proposed regulations will have a significant economic impact on a substantial number of small entities in compliance with the Regulatory Flexibility Act of 1980 (RFA). The primary purpose of the RFA is to relieve small businesses, small organizations, and small governmental jurisdictions (collectively: "small entities") of burdensome regulatory and recordkeeping requirements. The RFA requires that if regulatory and record keeping requirements are not burdensome, then the head of a Federal agency must certify that the requirement, if promulgated, will not have a significant effect on a substantial number of small entities.

This RIR/IRFA analyzes the probable impacts that the proposed alternatives for a third amendment of the salmon FMP would have on the high-seas salmon fisheries off the coast of Alaska. It also estimates the number of salmon fishing vessels to which the regulations implementing this amendment might apply.

2.2 SUMMARY OF THE FISHING FLEET COVERED BY THIS AMENDMENT.

The revised fishery management plan deals primarily with the commercial troll fishery, although it recognizes that some minor amount of sport fishing does occur in the EEZ infrequently. In 1988, the Alaska Commercial Fisheries Entry Commission issued 956

power troll permits and 1,868 hand troll permits; in addition the NMFS Alaska Region issued 1 power troll permit. These numbers have remained fairly stable in recent years (see NPFMC, 1989b, Table 1). In 1988, 828 power trollers and 777 hand trollers landed salmon. According to ADF&G Region 1 Commercial Fisheries Division staff, almost none of the hand trollers fish in the EEZ and probably less than half of the power trollers fish in the EEZ; the data on which boats actually fish in the EEZ is unavailable.

2.3 ANALYSIS OF THE SOCIOECONOMIC IMPACTS OF THE PROPOSED AMENDMENT AND THE ALTERNATIVES CONSIDERED BY THE COUNCIL.

Most of the changes the proposed amendment will make to the fishery management plan are changes to the document and bureaucratic procedures, not changes to the way the fishery will be conducted. The two changes which might have socioeconomic impacts are (1) extending the jurisdiction of the plan over the EEZ west of 175° east longitude and (2) changing the process for regulating the fishery, particularly the way of officially announcing inseason changes of the management measures.

2.3.1 Impacts caused by extending jurisdiction of the plan over the EEZ west of 175° east longitude.

As long as the International Convention for the High Seas Fisheries of the North Pacific Ocean remains in effect, extending jurisdiction of the plan to the EEZ west of 175° east longitude will have no costs to the fisheries, to the Council, to management, to enforcement, or to the public in general. The domestic fishery would remain as it is. The foreign fishery would remain the same too, as it is governed under the Convention and the International North Pacific Fisheries Commission. Adoption of this amendment will provide Federal regulatory authority over the remaining part of the EEZ off Alaska should the INPFC be dissolved and in the remote event that a domestic salmon fishery develops there.

If the International Convention for the High Seas Fisheries of the North Pacific Ocean were to be dissolved and not replaced by a similar bilateral agreement between the United States and Japan, that action could cause significant biological and economic impacts. The costs and benefits would depend upon what the Council, the U.S. Government, and the Japanese high-seas salmon mothership fishery decide to do. Section 5.1.2 of the paper "Discussion of the need for and issues of the third amendment of the fishery management plan for the high-seas salmon off the coast of Alaska (NPFMC, 1989a) summarizes some of the possible impacts under four hypothetical situations (also see NMFS, 1987). The greatest benefit and least cost to the United States would be if Japan eliminated its high-seas salmon mothership fishery and caught its salmon when they were close to the Japanese Islands. If Japan wanted to continue its salmon

mothership fishery, an analysis of three possible situations shows the least benefits and greatest costs to the United States would come if Japan were forced out of the U.S. EEZ and expanded its mothership fishery in international waters east of 175° east longitude (See NPFMC, 1989a, Table 1). In the "worst case" scenario, United States and Canadian salmon fishermen would lose about 26.8 million salmon at a 1987 ex-vessel value of about US\$ 133.7 million. These potential economic effects, however, are not associated with nor attributable to the proposed third amendment of the salmon plan.

2.3.2 Impacts caused by changing the means for regulating the troll fishery.

The draft package of documents for amending the plan proposes two alternatives for the Council to consider for streamlining the regulatory process: (a) defer to the State of Alaska for regulating the salmon fishery and (b) maintain the status quo or modify it with some faster means of issuing regulations. Neither of these alternatives would increase substantially the cost of fishing or of managing the fishery. Each would provide more rapid notice to the fishermen and would reduce uncertainty and confusion among the fishermen about the regulations. The first would also substantially reduce the amount of duplicative State and Federal actions and paperwork.

2.3.2.1 If the Council Defers Regulatory Authority to the State.

The first alternative proposes to defer regulatory authority to the State (to the extent that vessels fishing in the EEZ are registered under the laws of the State of Alaska), unless conditions require the NMFS Regional Director to issue specific regulations for the fishery in the EEZ. This alternative would not change the way most fishermen operate or receive their notices of fishing times, areas, quotas, and other regulations. The benefits are that it would provide quicker notice to the fishermen than the present Federal system provides and it would be from a single source; both of these features would eliminate some of the past confusion among the fishermen and enforcement personnel as to when and which areas were open for trolling. It would also eliminate a considerable amount of Federal effort and paperwork that duplicates State effort and paperwork, and it would reduce the number of Federal regulations published in the FEDERAL REGISTER. The overall reduction in duplicative effort and paperwork would amount to a savings of about one employee-year or roughly \$100,000 in salaries, benefits, supplies, equipment, publishing costs, and other expenses, which could be applied, instead, to other tasks. In summary, this alternative would provide several small benefits to fishermen and government and decrease the net costs to government, but it would not change the net costs of the fishermen.

2.3.2.2. If the Council Maintains the Status Quo.

The second alternative proposes that the Council retain the current way of managing the salmon fisheries in the EEZ, with NMFS (in cooperation with ADF&G) issuing preseason and inseason regulations. Maintaining the status quo would continue the unnecessary duplicative regulatory process, the short time between announcing a Federal inseason change to the regulations and when the change takes place, and the confusion among the fishermen from two sets of regulations (State and Federal).

One variation on the status quo would authorize NMFS to notify fishermen of regulations (particularly inseason changes to regulations) with messages broadcast by NOAA's National Weather Service and with news releases. Presently, NMFS (to provide the public with "constructive" notice) formally files regulations with the Office of the Federal Register before they can become effective, although NMFS also has had the National Weather Service broadcast the notices and with ADF&G jointly issue news releases and emergency orders. The only change would be to make the radio messages the official notification of the regulations rather than the formal filing of the notice with the Office of the Federal Register. The benefits of the proposed change would be consistent State and Federal regulations, quicker reactions to changes in salmon abundance and harvest rates, advance notice to the fishermen of the changes, and less uncertainty among fishermen and enforcement personnel. The costs to fishermen and government would stay the same.

A second variation on the status quo would be for NMFS to maintain telephones with recorded messages of salmon fishing regulations. The benefits of this approach to the fishermen would be quick notice and less confusion; to government, it would be the ability to react quickly to changes in salmon abundance or harvest rates, timely notice, and less uncertainty for enforcement personnel. The costs to fishermen and government might change slightly, as discussed in the next paragraph.

At first glance, it would appear that this second variation would increase substantially the cost of doing business for the trollers and government. If the recorded messages were not on a toll-free telephone line, the fishermen would have to pay for the marine radio and long-distance telephone charges, each time he telephoned in to determine where and when the troll fishery would be open. For practical purposes, however, there will be no measurable increased cost to the trollers. The present State system and the informal grapevine system among the trollers provide rapid and sufficient notice to the trollers about the salmon fishing regulations. The NMFS recorded telephone message

will simply be an official way of announcing the inseason changes but, in practice, will actually serve as a supplemental system. Filing the notice in the Office of the Federal Register has been the official way of notifying fishermen of salmon fishing regulations but, in practice, was not used by the fishermen as a useful source of official notice, especially for the inseason adjustments of the regulations. The cost to government will increase slightly to cover the expenses of maintaining one or more telephone lines and message machines, but this cost is not significant.

2.3.3 Impacts on Small Entities

The proposed amendment will have no significant adverse impacts on or costs to small entities. It will, however, provide several benefits in the form of more timely notices to fishermen, reduced confusion among fishermen and enforcement personnel, and management of the troll fishery as a unit.

2.3.4 Impacts on Management Costs

NMFS expects that Federal and State management and enforcement costs will increase or decrease little, if at all, under the proposed amendment. If the Council and NMFS are able to replace FEDERAL REGISTER notices with recorded telephone messages, the costs for NMFS and NOAA (in terms of employee-hours, cost of producing and approving of the messages, cost of the recording and playback devices, and costs of publishing notices in the FEDERAL REGISTER) will probably be reduced a little. Enforcement costs will be unchanged by this amendment.

3.0. OTHER EXECUTIVE ORDER 12291 REQUIREMENTS

Executive Order 12291 requires that the following three issues be considered:

- (a) Will the amendment have an annual effect on the economy of \$100 million or more?
- (b) Will the amendment lead to an increase in the costs or prices for consumers, individual industries, Federal, State, or local government agencies or geographic regions?
- (c) Will the amendment have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S. based enterprises to compete with foreign enterprises in domestic or export markets?

Fishery regulations do impose costs and cause redistribution of costs and benefits. If the proposed regulations are implemented to the extent anticipated, these costs are not expected to be significant relative to total operational costs.

This amendment will not have an annual effect of \$100 million or more, and this amendment is not expected to alter the amount or distribution of the harvest.

This amendment will not lead to a substantial increase in the price paid by consumers, local governments, or geographic regions because no significant quantity or quality changes are expected in the salmon harvests, nor will it lead to increased costs of enforcement and management by State and Federal fishery agencies.

This amendment will not have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of U.S.-based enterprises to compete with foreign enterprises in domestic or export markets.

4.0 EFFECTS ON THE ALASKA COASTAL ZONE

For the reasons discussed previously in this document, the fisheries managed under this plan in the EEZ will be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Zone Management Program, within the meaning of Section 307(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

5.0 EFFECTS ON ENDANGERED SPECIES

None of the alternatives would constitute actions that may affect endangered species or their habitat within the meaning of the regulations implementing Section 7 of the Endangered Species Act of 1973. Thus, consultation procedures under Section 7 on the final actions and their alternatives will not be necessary.

[Since this document was submitted to the Council, NMFS (on 5 April 1990) issued an emergency rule to add the Steller sea lion to the list of Threatened Species under the Endangered Species Act. The Alaska salmon troll fishery is classed as a Category 2 fishery, not because marine mammals are caught by trollers, but because some trollers use firearms to drive sea lions away from their gear. The emergency rule will remain in effect until 31 December 1990, but NMFS intends to have permanent

regulations in place before the emergency rule expires. NMFS is initiating consultation procedures under Section 7.]

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National Marine Fisheries Service.

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North Pacific Fishery Management Council.

1978. Fishery Management Plan for the High Seas Salmon Fishery Off the Coast of Alaska East of 175 Degrees East Longitude. vi + 130 p.

- 1989a. Discussion of the Need for and the Issues of the Third Amendment of the Fishery Management Plan for the High-Seas Salmon off the Coast of Alaska. iii + 30 p.

- 1989b. Draft of the Revised Fishery Management Plan for the Salmon Fisheries in the EEZ off the Coast of Alaska. vii + 78 p.

- 1989c. Habitat Section for the Fishery Management Plan for the Salmon Fisheries in the EEZ off the Coast of Alaska. v + 54 p.

Pacific Salmon Treaty.

1985. Treaty Between the Government of the United States of America and the Government of Canada Concerning Pacific Salmon. 23 pages.

APPENDIX G

DISCUSSION OF THE NEED FOR AND THE ISSUES OF

THE REVISION (THIRD AMENDMENT) OF THE
FISHERY MANAGEMENT PLAN FOR THE HIGH-SEAS SALMON
OFF THE COAST OF ALASKA

Prepared by the Staffs
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APRIL 1989

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1.0 SUMMARY

This document discusses the need for amending the Fishery Management Plan for the High Seas Salmon off the Coast of Alaska (FMP or plan) and discusses two issues for the Council's review and action. If the draft revised plan is adopted by the Council and approved by the Secretary, it will constitute the third amendment of the original FMP but will be a new plan.

This document shows that four situations made this amendment necessary: (1) the process for managing the fishery changed with the signing of the Pacific Salmon Treaty, (2) the scientific data contained in the plan had become outdated and the existing plan contained minor errors the Council wanted corrected, (3) amendments of the Magnuson Act required FMPs to consider fish habitat and vessel safety, and (4) the process for regulating the troll fishery needed to be streamlined to make it more timely and reduce confusion. In addition, the Council wanted to consider extending the jurisdiction of its plan to the area of the EEZ off Alaska west of 175° East Longitude.

Proposed Changes and Issues for Council Consideration

The draft revised plan makes several changes to the existing fishery management plan. It changes the name of the plan, condenses it, and reorganizes it. It updates and corrects the text and tables, and brings the plan into conformity with the Pacific Salmon Treaty and recent amendments of the Magnuson Act.

This document contains two major issues for the Council's consideration:

(1) Extend the jurisdiction of the plan over the EEZ west of 175° east longitude.

(2) Streamline and speed up the process for regulating the salmon fisheries. Two possible alternatives to the present process are proposed: (a) defer regulatory authority to the State of Alaska or (b) maintain the status quo of infrequent Council involvement, but routine involvement by the National Marine Fisheries Service with Federal regulations for the salmon fisheries in the EEZ.

2.0 THE NEED FOR AMENDING THE FISHERY MANAGEMENT PLAN

The Fishery Management Plan (FMP) for the High-Seas Salmon Fisheries off the Coast of Alaska East of 175° East Longitude was approved in 1979 and last amended in 1981.

Since 1981, a number of things have happened, among them-- the scientific data in the FMP have become historical rather than the best available, the Pacific Salmon Treaty between the United States and Canada came into being (1985), and the Magnuson Act was amended to require FMPs to consider temporary adjustments of fishery regulations to provide for the safety of vessels and to include information on the significance of habitat and assess the probable effects that changes to habitat may have on the fishery.

At its meeting in June 1986, the Council considered five broad options for its salmon FMP: (1) Withdraw the FMP (and Council management of the salmon fisheries); (2) Make minor revisions to the FMP to correct errors and incorporate the best available scientific data; (3) Delegate management authority to the State of Alaska; (4) Make major changes to the FMP to provide more management flexibility as well as correct errors and incorporate the best available scientific data; and (5) Amend the FMP to close the EEZ to all commercial salmon fishing (NPFMC, 1986a).

The Council opted to revise its management plan for the salmon fisheries so that it would provide for Council oversight with minimal routine involvement, allow for annual catch levels to be set in accordance with the Pacific Salmon Commission actions and for seasons and inseason management measures to echo those set by the State of Alaska, to bring all of the biological material and catch statistics in the FMP up to date, and to incorporate the new requirements of the Magnuson Act (NPFMC, 1986b).

In June 1987, the Council reviewed a preliminary update of the FMP and directed its salmon plan team to continue revising the draft according to the Council's previous directives but also include an option for the Council of extending the jurisdiction of the plan to include the EEZ off Alaska west of 175° E. longitude (NPFMC, 1988). This proposed amendment provides all those changes.

3.0 SUMMARY OF THE PROPOSED AMENDMENT

The proposed amendment completely revises the existing (twice amended) fishery management plan. It renames, reorganizes, updates, corrects, and shortens the document. Also it contains two issues for Council decisions. The draft of the revised fishery management plan contains the details. To summarize, aside from the changes in style, this proposed amendment makes the following changes and involves the following two issues:

CHANGE 1. Revises the plan to incorporate recent scientific data on the salmon stocks and the salmon harvests by the troll fishery, corrects errors, makes the management measures for the fishery in the EEZ consistent with those in adjacent State waters (as the Council originally intended) and makes it consistent with recent provisions of the Magnuson Act for vessel safety and habitat and the Pacific Salmon Treaty;

CHANGE 2. Changes the name of the plan, condenses, reformats, and reorganizes it.

ISSUE 1. Extend the jurisdiction of the plan over the EEZ west of 175 degrees East Longitude.

ISSUE 2. Streamline the process of regulating the fisheries, particularly the inseason procedures.

4.0 DISCUSSION OF THE PROPOSED CHANGES.

4.1. CHANGE 1: *Updates the fishery management plan to incorporate the latest scientific information on the salmon stocks and the salmon harvests by the troll fishery, correct errors, make the management measures consistent with those in adjacent State waters, and make the plan consistent with recent provisions of the Magnuson Act for vessel safety and habitat and the Pacific Salmon Treaty.*

The Council has to amend the plan; maintaining the status quo is not an available alternative. First, the data contained in the existing plan (as amended) were last updated in 1981; thus, the plan is in danger of being inconsistent with National Standard 2, which requires conservation and management measures to "be based upon the best scientific information available" (16 U.S.C. 1851(a)(2)). Second, the plan contained several errors and outdated management measures that needed to be corrected. Third, the Magnuson Act (§302(a)(note)) requires each FMP--(a) that after 1 January 1987 was submitted to the Secretary for review or prepared by the Secretary or (b) was in effect as of 1 January 1987 but was being amended--to consider vessel safety (§303(a)(6)) and habitat (§303(a)(7)).

4.1.1. Relevant Data Needed to be Updated.

Ten years have passed since the Council adopted this FMP in December 1978. Since then, the fishery has changed considerably (most obvious is the reduced length of the summer fishing season), new scientific information relevant to the salmon fisheries has become available, the U.S. and Canada have agreed to and implemented the Pacific Salmon Treaty, many of the depressed chinook stocks are recovering, and a number of agency procedures have changed.

The latest scientific information contained in the FMP is for 1981; much is from 1977 and earlier. Much new information is now available on the times, areas, and levels of harvests; on the distribution of various chinook stocks in the fisheries and the exploitation rates of those stocks; on the allowable harvest levels; on the incidental harvests or mortalities of salmon in several fisheries; and on the economics of the fisheries. Some text and background information compiled for the Council by Natural Resources Consultants in 1981 could be incorporated by reference into the amended FMP, as could other material on chinook, coho, and the other species contained in the reports of the Pacific Salmon Commission's Joint Chinook, Coho, and Transboundary Rivers Technical Committees. The failure of the

plan to incorporate the best available recent scientific information leaves the Secretary susceptible to litigation under section 301 of the Magnuson Act.

4.1.2. The Amendment Needs to Correct Errors and Change the Plan to Reflect the Council's Intent.

The existing plan (as amended) contains several errors. Most are minor, e.g., typographic errors, wrong words (to, rather than of), but three--having to do with sport fishing regulations, MSY and OY, and statistical reporting areas--are major. The draft revised plan corrects these errors.

Sport Fishing Regulations--The existing plan states that the Council's sport fishing regulations "adopt the State of Alaska (S.E. Region) regulations" for the sport salmon fishery in the EEZ (§8.3.1.1(A)(3)) and that "the sport fishery daily and possession bag limit matches that adopted for the S.E. Alaska coastal area by the Alaska Board of Fisheries" (§8.3.1.2(D)). But elsewhere in §8.3.1.2(D), the plan sets the sport bag limit and possession limit at 6 salmon, of which 3 may be chinook. Those limits were true of the Alaska regulations when the FMP was adopted, but they are not true now. Presently, Alaska regulations for State waters of Southeast Alaska adjacent to the EEZ, the sport bag and possession limits for chinook salmon is 2 per day, 2 in possession, at least 28 inches long. For salmon other than chinook, the bag and possession limits are related to size categories: for salmon other than chinook at least 16 inches long, the limit is 6 of each species per day, 12 each in possession. For those less than 16 inches long, 10 per day in the aggregate, 10 in possession (ADF&G 1989).

The plan governs sport salmon fishing throughout the EEZ off the entire coast of Alaska east of 175° east longitude, not just that off Southeast Alaska; as it clearly states in §8.3.1.1(A)(3): "All waters are open to sport fishing year around." Thus the plan now applies out-of-date State sport fishing regulations for Southeast Alaska to the EEZ for all Alaska. Thus, we now have a situation where management measures for the sport salmon fishery in the EEZ differ from those in adjacent State waters. For example, in the Kodiak area the 1988 State sport limits for chinook salmon are -- 20 inches or more: 3 per day, 3 in possession, only 2 in possession over 28 inches; less than 20 inches, 10 per day, 10 in possession.

The draft revised plan corrects this inconsistency by stating the size, bag, and possession limits for the sport salmon fishery in the EEZ will be: "the same as those adopted by the Alaska Board of Fisheries for the sport fishery in adjacent State waters."

MSY and OY--The existing plan calculates MSY and OY values on the basis of the historical recorded landings of salmon by all commercial fisheries in the East and West Areas. It ignores the sport harvest, which even now is a significant part of the chinook and coho harvests, and subsistence harvests. The existing plan makes no attempt to calculate MSY or OY for the commercial troll fishery, the only fishery it actively manages. Moreover, the plan failed to estimate MSY for each stock throughout its range under prevailing ecological and environmental conditions.

The draft revised plan claims that calculating MSY for the troll fishery with any reasonable degree of accuracy and precision is impossible, and prescribes OY for chinook salmon as "those numbers allocated by the Alaska Board of Fisheries based on the all-gear harvest ceilings set by the Pacific Salmon Commission." Pacific Salmon Commission harvest quotas or guidelines, presumably, take into account the maximum allowable harvests from each stock throughout its range because the Pacific Salmon Treaty (as the Magnuson Act) rests on the principles of preventing overharvesting and providing for optimum production.

This new definition of MSY includes any harvest of chinook salmon produced by Alaska's salmon enhancement activities that can be excluded from the Pacific Salmon Commission's harvest ceilings (the so-called add-ons). For coho salmon, the draft revised plan states the annual OYs "will be determined inseason by the Alaska Department of Fish and Game in consultation with the National Marine Fisheries Service." For pink, chum, and sockeye salmon, the annual OYs "are the number or weight of these salmon harvested by legal gear during open fishing periods in open fishing areas."

Statistical Reporting Areas--The existing plan, as amended, contains the Alaska Department of Fish and Game commercial salmon statistical reporting areas in existence in 1980. Since then, the statistical reporting areas have been redesigned and renumbered. The Council's intent, as stated in the existing plan, was that "Reporting requirements by domestic fishermen and processors are identical to existing State requirements as set forth in Alaska Statutes Title 16."

The draft revised plan deletes the outdated statistical reporting areas and revises the reporting requirements to be consistent with the Council's intent by stating for the commercial salmon fishery the reporting requirements are the current State requirements.

Other Errors--The existing plan contained a number of typographic errors, some inconsistencies between the numbers in tables and the text, referred specifically to power trolling (although the Secretary of Commerce disapproved the Council's

proposal to ban hand trolling in the EEZ), and used the term and concept of field order (even though the Federal regulatory system does not contain the term or provide for the concept). It also contained a large inconsistency between the text and the actual practice of regulating the fishery to protect coho salmon.

Amendment 1 of the plan provided for closing the entire troll fishery for 10 days "beginning on or about July 10, unless evaluation of the coho salmon run indicates a well above average magnitude and good movement inshore." this closure was designed to assist in stabilizing or reducing coastal and offshore fishing effort on coho, as well as assisting catch and spawning escapement inshore.

Since 1980, that provision has been used only once to close the coho fishery in mid-July; that was in 1981 when the fishery was closed from 15 - 24 July. The coho fishery was closed in mid-August of 1981, 1984, 1985; late July and mid-August 1986; early August 1987; and late July, mid-August, late August, and early September 1988. Consequently, the fishery was being managed by the intent of the plan, not the specific words of the plan. Obviously, the wording in the plan needed to be amended so the wording matched the intent and the actual practice.

The draft revised plan deletes the specific wording of time and duration and replaces it with the statement: "The Council intends that if the State imposes . . . an inseason closure to protect coho, then a similar closure of appropriate timing and length will be instituted for the EEZ" This aspect of the plan is subject to change depending on the Council's action on Issue 2.

The existing plan gives the Regional Director the authority to make inseason adjustments to fishing seasons and fishing areas by issuing field orders so he can "take immediate action . . . to adjust time and/or area restrictions." The plan (§8.3.1.5.2) states these adjustments "will be effected by the issuance of a field order and announcement in the manner currently utilized by the State of Alaska."

The Federal rulemaking process, however, has no provisions for a Regional Director to implement field orders on his own. Inseason adjustments to Federal regulations are usually made by filing a document for public inspection with the Office of the Federal Register and then publishing that document in the FEDERAL REGISTER. Under the usual Federal procedures, the adjustments only become effective when the signed notice is filed for public inspection.

The draft revised plan replaces the term field order with inseason adjustment. Exactly how future inseason adjustments will be made depends upon Council action on Issue 2.

The draft revised plan also removes all the typos and inconsistencies that were in the existing plan (although it may have added new ones).

4.1.3. The Plan Needs to Consider Fish Habitat.

Until 1986, the Magnuson Act had no specific provisions concerning fish habitat, although efforts to integrate habitat considerations into the fishery management process go back to the inception of the act in 1976. The Magnuson Act directed the Councils to recommend management plans for commercial and recreational species of fish occurring in the EEZ throughout the range of the species. Some people believed this directive gave the Councils authority to consider fishery related habitat issues within the territorial sea and farther inland even though the Councils clearly did not have jurisdiction within State waters.

NMFS has stewardship for all living marine resources under Federal jurisdiction. In 1983, NMFS a National Habitat Conservation Policy (48 FR 53142), uniting its responsibilities and authorities under the Magnuson Act with those of the Fish and Wildlife Coordination Act and the National Environmental Policy Act. Of the several strategies NMFS developed to implement this policy, one called for NMFS to rely to a greater degree on its partnership with the Regional Fishery Management Councils, particularly as this partnership relates to fisheries subject to fishery management plans. This strategy states that the Councils "should address habitat considerations in their Fishery Management Plans, where applicable, based on the best available information." The policy contains details on what FMPs should contain as a minimum. Although the NMFS habitat policy notifies other agencies and the Councils of NMFS's intent, it did not clarify the Council's role regarding fishery related habitat issues.

In 1986, Congress amended the Magnuson Act, essentially codifying elements of the NMFS habitat policy and giving the Regional Fishery Management Councils new authority and responsibilities regarding fish habitat. The amendment required that fishery management plans shall "include readily available information regarding the significance of habitat to the fishery and assessment as to the effects which changes to that habitat may have upon the fishery" (16 USC 1853(a)(7)). The amendment also provided that "each Council may comment on, or make recommendations concerning, any activity undertaken, or proposed to be undertaken, by any State or Federal agency that, in the view of the Council, may affect the habitat of a fishery resource under its jurisdiction . . ." (16 USC 1852(i)).

In September 1988, the Council adopted a policy on habitat of its own. The Council recognized that all species are

dependent on the quantity and quality of their essential habitats and, therefore, declared it would be the policy of the Council to "conserve, restore, and develop habitats upon which commercial, recreational and subsistence marine fisheries depend, to increase their extend and to improve their productive capacity for the benefit of present and future generations." The Council supported this policy with three objectives: (1) Maintain the current quantity and productivity capacity of habitats supporting important commercial, recreational and subsistence fisheries, including their food base under the guiding principle of NO NET HABITAT LOSS from man's activities; (2) Restore and rehabilitate the productive capacity of habitats which have already been degraded; and (3) Create and develop productive habitats where increased fishery productivity will benefit society.

Consequently, the Council has prepared a section on salmon habitat to be appended to this fishery management plan. This section contains the most recent and substantive information regarding salmon habitat considerations and issues, and it defines the habitat significant to the five species of Pacific salmon covered by the plan.

4.1.4. The Plan Needs to Consider Vessel Safety

In view of the high loss of life and vessels in the fishing industry, the 1986 amendment of the Magnuson Act required that any fishery management plan or amendment of a plan completed after 1 January 1987 shall "consider, and may provide for, temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safety of vessels" (16 USC 1853(a)(6)).

Accordingly, this amendment of the plan incorporates provisions for vessel safety (§6.6.2 of the revised plan). The existing plan provided the necessary flexibility to consider adjustments for access to the fishery by vessels denied harvest opportunity by unsafe weather or other ocean conditions, specifically §8.3.1.5(A)(7) "any other factors necessary for the conservation and management of the offshore troll fishery." This amendment now places a focus on considerations for vessel safety. In addition, the process for evaluating all future proposed amendments of the plan will be to consider whether they will result in the need for temporary adjustments for access.

4.1.5. The Plan Needs to be Consistent with the Pacific Salmon Treaty.

The Pacific Salmon Treaty added another layer of constraints on the salmon fisheries of Southeast Alaska. Among other things, the treaty (a) established the Pacific Salmon Commission, (b) established principles and a framework for how each country would manage its salmon fisheries and undergo enhancement activities, (c) established three panels to provide information and make recommendations for the commission, and (d) provided for several joint technical committees (including one on chinook and one on coho) to study the technical aspects of the fisheries and report to the panels and commission.

Of particular importance to the troll fishery of Southeast Alaska, the treaty directed the two nations to take the following actions:

(a) instruct their respective management agencies to manage their chinook fisheries to (i) halt the decline in spawning escapements of depressed chinook salmon stocks, and (ii) attain by 1998 the spawning escapement goals established to restore production of natural chinook stocks by 1998, on the basis of a rebuilding program started in 1984;

(b) ensure that in the annual harvests of chinook by all fisheries in S.E. Alaska does not exceed the harvest limit the Commission establishes for chinook salmon each year. The treaty allowed the harvest of chinooks in a region to exceed the established ceiling as long as the region can demonstrate to the commission that the excess comes specifically from its new enhancement activities and that the rebuilding schedule is not extended beyond 1998, and the Commission provided for an allowable management error of 7.5 percent, as long as the cumulative error over the years does not exceed 7.5 percent.

(c) maintain a joint chinook technical committee to (among other things) evaluate management actions for their consistency with and potential effectiveness of the measures set out in the chinook chapter of the Annex 4 of the treaty;

(d) monitor, assess, report, and minimize the effects of associated fishing mortalities;

(e) manage the fisheries so that the bulk of the depressed stocks preserved by the conservation program accrue principally to the spawning escapement.

The draft revised plan describes the roles of the Pacific

Salmon Treaty and Pacific Salmon Commission and incorporates the Commission's decisions into the determinations of OY.

4.2 CHANGE 2: *Rename the plan, condense the text, and reorganize the contents.*

The present title of the plan confused some people because it sounded as if the plan governed all the salmon fisheries on the high seas off the coast of Alaska, including the salmon fisheries in the international waters of the high seas, seaward of the U.S. EEZ. The proposed title is more specific: The Fishery Management Plan for the Salmon Fisheries in the U. S. EEZ off the Coast of Alaska.

In June 1986, the Council recommended that the salmon plan team proceed with drafting an amendment of the salmon plan. The Council said they would like the plan shortened, maybe to about 5 pages. The length of a fishery management plan, however, is dictated somewhat by the Magnuson Act's required contents for fishery management plans (§303(a)).

In February 1988, members of the Council and NMFS staff discussed how the plan should be reformatted and shortened. They decided to rewrite the salmon plan along the lines of the Council's draft plan for managing the crab fisheries in the Bering Sea. Accordingly, this draft revision bears little resemblance to the existing salmon plan, its text has been reduced from more than 135 pages to about 75 pages, and it is organized along the lines of the draft crab plan.

5.0 DISCUSSION OF THE ISSUES.

5.1. ISSUE 1. Extend Jurisdiction of the Plan Over the EEZ West of 175° East Longitude.

5.1.1. Review of the Present Situation

The plan now provides a basis for Federal regulations governing all domestic and foreign salmon fishing in the EEZ off the coast of Alaska except for the EEZ west of 175° east longitude (Figure 1). It establishes that the entire annual allowable harvest of salmon in the area of its jurisdiction can be taken by domestic fishermen and, therefore, there is no allowable foreign fishing.

Originally, the Council excluded the waters of the EEZ west of 175° E from the jurisdiction of its salmon plan because (a) no U. S. salmon fishery took place in those waters and (b) salmon fishing in those waters was subject to the International Convention for the High Seas Fisheries of the North Pacific Ocean (Convention) and was governed under the International North Pacific Fisheries Commission (INPFC).

A combination of State of Alaska and Federal laws and regulations and geography prohibit any person or fishing vessel subject to the jurisdiction of the United States from harvesting salmon in the EEZ or international waters west of 175° east longitude. The reason behind this prohibition is that the stocks of salmon found in this area are already being harvested at optimum levels (are fully utilized) by the domestic inshore fisheries, and any domestic harvest there would simply be a reallocation from the inshore fisheries with no net benefits to Alaska or the United States.

Current State of Alaska regulations (5 AAC 12.330) allow only seine gear in State waters adjacent to the EEZ west of 175° east. Moreover, State regulations allow commercial salmon trolling only in waters east of Cape Suckling, i.e., Southeast Alaska (5 AAC 30.330 and 5 AAC 33.330).

Federal regulations (50 CFR 210) implementing The North Pacific Fisheries Act (16 USC 1025) prohibit, with minor exceptions, net fishing for salmon seaward of the territorial sea.

Conceivably, United States fishermen using gear other than nets (e.g., trolling gear or floating longlines) from vessels not registered by the State of Alaska could harvest salmon west of

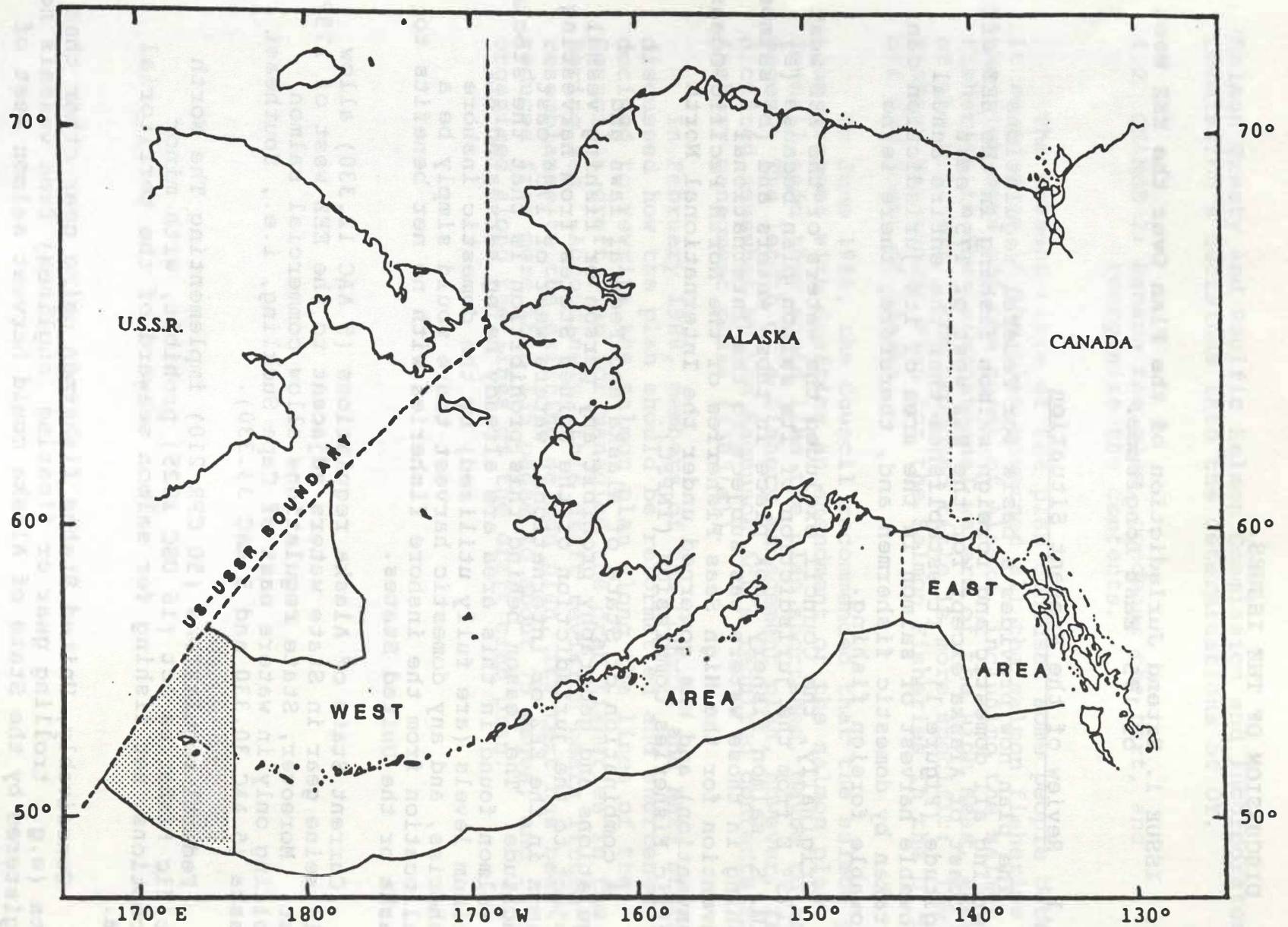


Figure 1. Map showing the East and West Salmon Management Areas in the U.S. Exclusive Economic Zone (EEZ) off the Coast of Alaska. The shaded area [] is the EEZ west of 175° East Longitude.

175° east, but the remoteness of this area makes that possibility unlikely.

The International Convention and the INPFC allow the Japanese high-seas mothership fishery to harvest salmon in the EEZ off Alaska west of 175° east longitude under a number of restrictions in exchange for the exclusion of the Japanese mothership and land-based high-seas salmon fisheries from international waters in the North Pacific Ocean east of that line as well as from some parts of the Bering Sea. Under the current agreement, the Japanese mothership fishery is allowed to harvest salmon in this area past 1994 (see Figure 2). A primary purpose of this agreement is to allow Japan the opportunity to continue its traditional harvest of salmon of Asian origin, primarily chum salmon, while keeping to a tolerable level the interceptions of North American salmon, especially Bristol Bay sockeye.

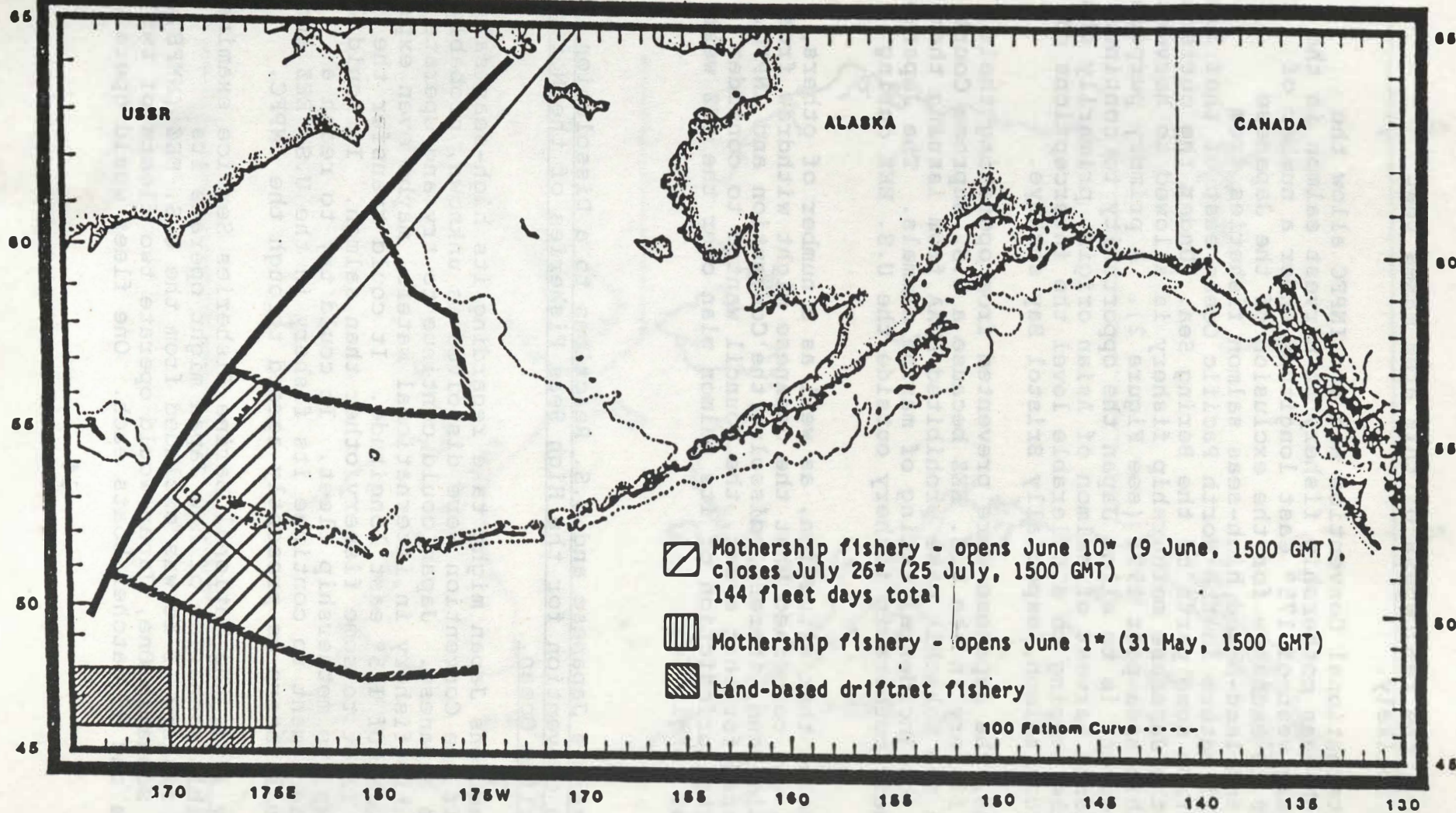
In 1988, the Japanese were prevented from operating their mothership fishery in the U.S. EEZ because a U.S. Supreme Court decision in the Kokechik case prohibited NOAA from issuing them a permit for the incidental taking of marine mammals. The Japanese operated their mothership fishery outside the U.S. EEZ during 1988.

Because of that situation, as well as a number of others, the Council was concerned that the Japanese might withdraw from the Convention and, thereby, dissolve the Convention and INPFC. To be prepared for that event, the Council wanted to consider extending the jurisdiction of its salmon plan over the EEZ west of 175° east longitude.

5.1.2. Possible Japanese and U.S. Reactions to a Dissolution of the Convention for the High Seas Fisheries of the North Pacific Ocean.

What actions Japan might take regarding its high-seas salmon fisheries if the Convention were dissolved is unknown, probably even to the Japanese. Japan could continue to try and operate its mothership fishery in international waters, maybe even expand to waters east of 175° east longitude. It could transfer the mothership fleet to some fishery other than salmon. It could simply scrap its mothership fleet. It could try to reach a bilateral agreement to continue its fishery in the U.S. EEZ and international waters as presently agreed through the INPFC.

In May 1987, the National Marine Fisheries Service examined three possible scenarios of how Japan might operate its mothership fishery if it was excluded from the U.S. EEZ (NMFS, 1987). In Scenario One, Japan would operate two fleets of two motherships and 86 catcher boats each. One fleet would operate



— U.S.-Russia Convention of 1867
 - - - - - Limit of U.S. Fisheries Conservation Zone
 * Japanese Standard Time (-9 GMT)

Prepared by:
 NMFS Office of Enforcement
 Juneau, Alaska
 June 1987

Figure 2. Map showing fishing areas for the Japanese high-seas salmon fishery in 1994 and following years, as governed by the International Convention for the High Seas Fisheries of the North Pacific Ocean.

in the Bering Sea outside the U.S. EEZ, and the other would operate in the North Pacific Ocean, south of the U.S. EEZ and west of 160° west longitude. In Scenario Two, Japan would operate the fleet of 4 motherships and 172 catcher boats in the Gulf of Alaska seaward of the U.S. EEZ, east of 160° west longitude and north of 46° north latitude. In Scenario Three, Japan would operate its mothership fishery as described in Scenario One and Scenario Two.

Scenario Three is the "worse case" examined in the analysis. Under this scenario, the Japanese mothership fleet would harvest more than 17.4 million salmon of North American origin, would kill (salmon caught but dying and dropping out of the net before being landed) an additional 26.8 million salmon, and would deprive U.S. and Canadian fishermen of about U.S. \$133.7 million ex-vessel value annually.

This NMFS report (Ibid.) also estimates the loss of salmon of North American origin and the discounted, present ex-vessel value deprived U.S. and Canadian fishermen from the Japanese mothership fishery as it has operated in recent years. This analysis shows that the mothership harvested and incidentally killed and lost between 708 thousand and 2,405 thousand sockeye, chinook, and chum salmon, worth an ex-vessel value between U.S. \$5.9 million and \$9.2 million. These are minimum cost estimates because the loss of value to the U.S. and Canadian recreational and subsistence harvests are not considered. Under the INPFC planned phase-down of the Japanese mothership fishery, its harvests of salmon of North American origin should decrease considerably from the levels of recent years.

Thus, if the assumptions made in the NMFS report (Ibid.) are realistic and the U. S. is unable to convince Japan to eliminate its high-seas salmon mothership fishery, it would appear that the best overall situation for the U.S. in terms of its own salmon fisheries is to try to keep the operation of the Japanese high-seas salmon mothership fishery under the provisions of the INPFC.

Table 1 compares the recent harvests and values under INPFC with the three scenarios. The numbers of North American salmon are directly comparable, although they would come from different areas and stocks, but the estimated ex-vessel values are not directly comparable because salmon landed in Western Alaska earn a lower price per pound than do those from Southeast Alaska, British Columbia, Washington, and Oregon.

If the Convention and the INPFC were dissolved, the U. S. would have no regulations governing salmon fishing in the EEZ west of 175° east longitude, except for Alaska regulations which prohibit, with some exceptions, vessels registered by the State from net fishing for salmon seaward of the territorial sea. Extending the plan's jurisdiction would provide a firm basis for

Federal regulation of any foreign and domestic salmon fisheries in that area.

Table 1. Losses of North American salmon and ex-vessel values to North American fishermen by the Japanese High-Seas Mothership Fishery Under Recent INPFC regulations and Under Three Hypothetical Scenarios Assuming no INPFC. (Source: NMFS, 1987)

	<u>Numbers of Salmon (millions of fish)</u>	<u>Ex-vessel Value (millions of US\$)</u>
Recent Under INPFC	0.7 to 2.4	5.9 to 9.2
Scenario One	14.8	87.4
Scenario Two	10.7	46.3
Scenario Three	25.5	133.7

For the Japanese mothership fishery, the United States has at least three choices: (1) it could use the Magnuson Act and Council action to drive the Japanese mothership fishery from the U.S. EEZ by denying a general international fisheries agreement (GIFA) and by setting TALFF for salmon equal to zero; (2) it could use the Magnuson Act and Council action to allow the Japanese mothership fishery to operate as presently agreed by providing some TALFF in the EEZ west of 175° east longitude and issuing a GIFA; (3) it could try to establish a bilateral agreement (treaty, convention) with Japan to allow the Japanese mothership fishery to continue operating in the U.S. EEZ as presently agreed under INPFC.

The first choice could easily result in the Japanese increasing substantially their interception and harvest of North American salmon and the North American salmon industry's economic losses, as shown in the three scenarios above. If the U. S. and the Council wanted to exclude the Japanese and all foreign salmon fishing from the EEZ and also keep the Japanese from harvesting salmon of U.S. origin in international waters, they could try to rely on the anadromous fish provision of the Magnuson Act. The Magnuson Act claims U.S. exclusive fishery management authority over "all anadromous species throughout the migratory range of each such species beyond the exclusive economic zone . . ." (§101(b)). The Council could try to persuade the U.S. to use this provision to make Japan refrain from harvesting U.S.-origin

salmon. So far, the U.S. has not attempted to exert this authority so no one knows if it would work successfully. Moreover, such an attempt would be difficult and expensive to enforce.

The second choice has two problems: (a) there is no guarantee the U. S. State Department would allocate the TALFF to Japan and (b) foreign fishing would be allowed in the EEZ but not domestic fishing, at least under present U.S. laws and regulations; thus, the OY for the EEZ west of 175° east longitude would all be allocated to TALFF. Nevertheless, the Council and the U. S. might want to take that approach. The Council has the authority to determine an amount of salmon surplus to the domestic harvesting capacity and make that surplus available as TALFF, and it might want to do so to keep the mothership fishery in that area under tight restrictions, rather than have it operate freely in International Waters seaward of the EEZ.

Under the Magnuson Act, a Council must assess and specify MSY and OY for a fishery (§3(18) and §303(a)(4)) and may make available for foreign harvest "the level representing that portion of the optimum yield . . . that will not be harvested by vessels of the United States . . ." (§201(d)(2)) unless "the making available of such portion (or any part thereof) . . . is determined to be detrimental to the development of the United States fishing industry; and . . . such portion or part will be available for harvest in the immediately succeeding harvesting season . . ." (§210(d)(4)). Although, the Council may specify the total amount of salmon available for foreign harvest in a part of the EEZ, the U.S. State Department makes the allocations of the TALFF among the foreign nations, and it considers many things besides the Council's wishes in making those allocations.

Of the three choices, the third choice would probably be the best course of action for the U.S. if Japan would agree. Under this third choice, it doesn't matter whether the Council extends the jurisdiction of the plan west of 175° east longitude because the international agreement on foreign fishing would take precedence over the plan's provisions.

5.1.3 Alternatives for the Council's Consideration

Essentially, the Council has three alternatives for consideration: (1) Maintain the status quo; do not amend the plan to extend its jurisdiction west of 175° east longitude; (2) Amend the plan now to extend its jurisdiction over the EEZ west of 175° east longitude; (3) Amend the plan now so that its jurisdiction will be extended west of 175° east longitude as soon as the INPFC convention is dissolved unless an equal or better international agreement replaces it.

Alternative 1: Maintain the Status Quo; keep the jurisdiction of the plan to the waters east of 175° east longitude.

Under this alternative, the plan would continue to allow the INPFC convention or the anadromous fish provision of the Magnuson Act to control the salmon fisheries in the EEZ west of 175° east longitude and in international waters. If the convention were dissolved, the Council could rely on the anadromous fish provisions of the act or amend the plan at that time.

Alternative 2: Amend the plan now to extend its jurisdiction over the EEZ west of 175° east longitude.

If the plan's jurisdiction were extended now, the Japanese mothership fishery could continue to operate as it does now under INPFC as long as the INPFC is in force.

If the INPFC and the Convention were to be dissolved, then the situation will depend upon how Japan and the United States react, as discussed above. If the Council's intent is to allow the Japanese to continue its mothership fishery under the principles of the current agreement, then it would have to either provide adequate salmon for TALFF and recommend that the TALFF be allocated to Japan or work toward a bilateral agreement between the United States and Japan. If the Council chose to allow the Japanese mothership fishery in the EEZ west of 175° east longitude, then it could probably set the OY for that fishing area equal to the amount of salmon the mothership fishery could harvest under the INPFC agreement, continue the prohibition on the commercial harvest of salmon by U.S. vessels in that area, and set the OY equal to TALFF. It could probably justify the prohibition on the U.S. fishery in that area because any harvest would simply be a reallocation from the traditional fisheries in State waters.

Alternative 3: Amend the plan now to extend its jurisdiction over the EEZ west of 175° east longitude as soon as the INPFC is dissolved.

Alternative 3 is simply a combination of Alternatives 1 and 2, but it avoids any delay in extending the jurisdiction of the plan if the INPFC is dissolved.

5.2 ISSUE 2: Streamline the Regulatory Process

5.2.1 Review of The Present Process.

The Council's existing plan for managing the salmon fisheries and its implementing Federal regulations place specific restrictions on fishing seasons, areas, and gear; minimum legal lengths for chinook salmon; and sport bag limits. In addition, they provide specific provisions, criteria, and procedures for adjusting the regulations during a fishing season.

The Council intended that the salmon fisheries in the EEZ and those in the adjacent State of Alaska waters be managed as a unit. Section 8.3.1.5.2 of the plan states that goal for the salmon troll fishery this way:

In order to assume effective management of the salmon troll fishery resource as a unit through its range, inseason adjustments made by the Regional Director must be coordinated with similar actions taken by the State regarding waters under State jurisdiction. It is necessary that the Regional Director, to the extent possible, acts in conjunction with the Alaska Department of Fish and Game in order to effect uniformity of management in State waters and the Fishery Conservation Zone.

The plan anticipated (Ibid.) that "any [inseason] adjustment made by the Regional Director or his designee will be effected by the issuance of a field order and announcement in the manner currently utilized by the State of Alaska."

The Federal regulatory process, however, does not allow Federal regulations to be changed in this way. Accordingly, the regulations implementing the plan (50 CFR 674.23(b)) state that "any field order issued by the Secretary . . . may [not] take effect until:

(i) it has been filed for publication with the Federal Register;

(ii) it has been posted for 48 hours, and otherwise made available to the public, in accordance with procedures customarily used by ADF&G for posting and publicizing similar notices of opening or closure;

(iii) it has been broadcast for 48 hours at those time intervals, channels and frequencies customarily used by ADF&G to broadcast similar notices of opening or closure; and

(iv) the public has been offered the opportunity to comment on the modification for a period of at least thirty (30) days, a final field order responding to any comments received has been published in the Federal Register, and a further waiting period of thirty (30) days has passed, unless the Secretary finds good cause for dispensing with these requirements in accordance with 5 U.S.C. 553.

5.2.2. The Present Process is Too Slow.

This Federal regulatory process, obviously, does not provide the quick changes necessary to manage a fishery, like a salmon fishery, that requires day-to-day management.

In essence, this process requires that the Regional Director prepare a notice of inseason changes to the regulations, submit it to NMFS/NOAA in Washington, D. C. for approval, and have it filed for public inspection with the Office of the Federal Register. Under best of conditions, the discussions between ADF&G and NMFS about the need for the change and the preparation of the notice and associated documents in the Alaska Region for submission to Washington, D. C., requires at least one work day (and usually two or more). Under standard operating procedures, the time required to approve and file a notice once it has been received by NMFS in Washington, D.C., is 3 working days, although in an emergency it can be done faster. The fact that when it's noon in Juneau it is 1600 in Washington, D.C., cuts off another half-day. Thus, overall the standard process for making a routine inseason change to the regulations would take at least 4.5 working days, although it can be done quicker if everyone tries to do it quicker and if there are no problems with computers, facsimile machines, or traffic jams or subway breakdowns in Washington, D.C.

5.2.3. A Quicker Process is Needed to Overcome Three Problems.

This slowness of the present Federal system can produce three problems: overharvests, inconsistencies between State and Federal regulations, and inadequate advance notice to the fishermen.

The most critical of these problems is overharvesting. Under the Pacific Salmon Treaty, the Pacific Salmon Commission sets a limit on the number of chinook salmon that can be harvested each year by all the salmon fisheries in Southeast Alaska. It also provides a range for management error of 7.5 percent on either side of the harvest limit, provided that the cumulative deviation shall not exceed that range. If it does,

the fishery will have to compensate for the excess in future years as well as pay any penalty assessed.

The Alaska Board of Fisheries allocates the chinook harvest limit among the groups of fishermen, and the Alaska Department of Fish and Game attempts to regulate those fisheries (including the commercial troll fishery, in cooperation with NMFS) so they harvest no more than their shares. The troll fleet (about 800 hand trollers and 825 power trollers) can harvest between 10,000 and 20,000 chinook salmon per day. In the summer of 1988 for example, trollers harvested their share of 162,200 chinook in 12 days, for an average of 13,517 chinook per day. Obviously, one extra day of fishing would result in substantial overharvesting. It is critical, therefore, that State and Federal regulations are able to close the chinook fishery as soon as the harvest limit is reached.

Secondly, the slowness of the Federal regulatory system results in State and Federal regulations that are inconsistent. Because the State can react far quicker than the NMFS, there have been occasions when the State changed the regulations for the troll fishery in State waters before NMFS could change the regulations for the troll fishery in the EEZ (see Table 1). These inconsistencies have led to confusion among the fishermen and enforcement officers.

For example, in 1988 coho salmon were much less abundant than normal. Consequently, ADF&G and NMFS were managing the troll fishery on the basis of day-to-day indices of coho abundance, and they each made at least seven inseason changes to fishing periods and areas. One of these inseason changes became almost a worst-case example. On Friday, 9 September, the current State and Federal regulations stated that the fishery north of Cape Spencer was to close at 2359 hours on Saturday, 10 September. Shortly before noon on Friday, the 9th, ADF&G notified NMFS that the latest indicators of coho abundance north of Cape Spencer and the number of trollers likely to fish that area would allow the troll coho fishery there to continue until the regular end of the season on 20 September. ADF&G issued a news release and ADF&G and NMFS issued a joint Emergency Order-Field Order stating that the fishery would remain open until the 20th. There was inadequate time, however, for NMFS to produce, process, approve, and file a notice of this decision with the Office of the Federal Register (OFR) before 1700 hours Eastern Daylight Time (EDT or 1300 hours Alaska Daylight Time) on Friday, the 9th, when the OFR closed for the weekend. As it turns out, that notice was signed by the Regional Director on Monday, 12 September, filed with the Office of the Federal Register at 1233 hours EDT on 14 September, and finally published on the 19th, one day before the fishery was to close for the year.

Table 1. Time of Events in the 1988 Federal Regulation of the Commercial Salmon Troll Fishery in the EEZ off the Coast of Alaska.

1. Notice setting summer trolling season and chinook harvest quota.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REG.</u>
0001 hr 01 JUL	*	20 APR	20 JUN ^a	20 JUN	30 JUN	1132 hr 01 JUL	07 JUL

2. Notice stopping chinook harvest and closing the Fairweather Grounds.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
2359 hr 12 JUL	*	8 JUL	8 JUL	12 JUL	12 JUL	1645 hr 12 JUL	15 JUL

3. Notice closing fishery for 10 days to protect coho.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
0001 hr 26 JUL	*	20 JUL ^b	19 JUL	25 JUL	25 JUL	1630 hr 25 JUL	28 JUL

4. Notice closing fishery for another 10 days to protect coho.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
2359 hr 14 AUG	*	11 AUG	11 AUG	12 AUG	12 AUG	1643 hr 12 AUG	17 AUG

5. Notice closing salmon fishery in the EEZ until further notice.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
2359 hr 31 AUG	*	22 AUG	29 AUG	31 AUG	31 AUG	1651 hr 31 AUG	06 SEP

Table 1 (Continued)

6. Reopening the EEZ north of Cape Spencer for several days.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
0001 hr	*					1654 hr	
04 SEP	*	01 SEP	01 SEP	02 SEP	06 SEP	06 SEP	09 SEP

7. Three-day extension of fishery from Cape Spencer to Cape Fairweather.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
2359 hr	*					1638 hr	
07 SEP	*	06 SEP	06 SEP	07 SEP	08 SEP	08 SEP	13 SEP

8. Extension of fishery north of Cape Spencer until further notice.

<u>Due to be Effective</u>	*	<u>1st Notice from ADF&G</u>	<u>Draft Notice Sent to D.C.</u>	<u>R.D. Signs his Memo.</u>	<u>D.C. Signs F.R. notice</u>	<u>Notice Filed with O.F.R.</u>	<u>Published in FED. REGISTER</u>
2359 hr	*					1233 hr	
10 SEP	*	09 SEP	11 SEP	12 SEP	14 SEP	14 SEP	19 SEP

^a The NMFS Alaska Region's Fisheries Management Division completed the first set of draft documents on 27 April 1988 and they were revised by 13 May. However, as of 16 June, the package of documents had not completed the clearance process within the Region. They were finally signed and sent to NMFS Washington, D.C. on 20 June.

^b On 18 July, ADF&G notified NMFS that a coho closure would be coming shortly, but ADF&G was undecided about the time, date, and locations until 20 July.

Because ADF&G had issued a news release and otherwise passed information to the fishermen that the fishing period had been extended, they continued fishing, including many who fished in the EEZ, which under Federal regulations was closed as of 2359 hours ADT on 10 September, even though the adjacent State waters were open. Because of the time that elapsed from the moment ADF&G and NMFS agreed to extend the fishery until the moment the FEDERAL REGISTER extension notice was filed, fishermen harvested coho salmon in a technically closed area for 3.5 days and NMFS enforcement officers refrained from arresting them.

The third problem arising from the slow Federal regulatory process is untimely notice to fishermen of changes in regulations. The current requirement that a notice becomes effective only after it has been filed for public inspection with the Office of the Federal Register comes from the Administrative Procedure Act and the legal presumption that filing the notice with the OFR provides actual notice of the action. The NMFS Alaska Region can not forecast with any accuracy when a notice will be filed, so it can not issue news releases stating the starting time of any action until after it has been informed that the notice has been filed. Thus, for many inseason adjustments, NMFS is unable to issue news releases or broadcast announcements over NOAA Weather Radio before the action takes place, unless it assumes the notice will be filed on time. Consequently, NMFS has been relying, to a large extent, on the ADF&G news releases.

5.2.4. Alternatives to the Present Process.

At the moment, there are no approved and tested alternatives to the present system. Presently, all Magnuson Act regulations nationwide require as a minimum that a regulation be filed with the Office of the Federal Register before it can go into effect.

Nevertheless, one alternative has been proposed that might be approved and would work; there might be others. The proposed alternative defers regulatory authority to the State of Alaska. The Council is attempting this approach with its plan for managing the crab fisheries of the Bering Sea.

Some variations on the present system might also work, but they have some unanswered legal questions. One would maintain the present joint efforts by ADF&G and NMFS but let a regulation become effective before it is filed with the Office of the Federal Register. A second would place the burden on the fisherman to determine what times and areas are open for salmon fishing and other salmon fishing regulations.

The legal questions relate to the Federal requirement of allowing for public participation in the rulemaking procedure and providing advance and adequate notice to everyone who will be

affected by a Federal regulation (Administrative Procedure Act of 1946). The main stumbling block is the requirement to provide "actual notice" to everyone who will be affected by the regulations. There are no hard and fast rules as to what constitutes actual notice, but such notification will have to satisfy the courts that actual notice had been given to all fishermen. The legal system operates on the presumption that filing a regulation for public inspection with the Office of the Federal Register provides actual notice to everyone. The Council might be able to make a strong case that one of the variations on the present system explained here would provide actual notice.

Alternative 1: Defer Regulation of the Troll Fishery to the State of Alaska.

Under this alternative, the fishery management plan and the Federal regulations would defer to the State of Alaska for managing the troll fishery. The State would manage the troll fishery (in State waters and the EEZ) as a unit the way it presently manages that portion in State waters unless the Director of the NMFS Alaska Region issued a change with a FEDERAL REGISTER notice. Thus, for the normal regulation of the fishery there would be no need for NMFS to file regulations with the Office of the Federal Register.

This approach would solve the present problems of inconsistent State and Federal regulations, confusion, and untimely notice and, it would satisfy the Council's original intent to manage the troll fishery as a unit.

This approach also falls within the scope of Executive Order 12612, which established nine principles of Federalism. The fifth principle seems particularly relevant in this situation. It states: "In most areas of governmental concern, the States uniquely possess the constitutional authority, the resources, and the competence to discern the sentiments of the people and to govern accordingly."

The Council's plan for managing the fisheries for groundfish in the Gulf of Alaska defers to the State the regulation of the fishery for demersal shelf rockfish as long as the State regulations are (a) consistent with specific provisions of the fishery management plan and (b) limited to establishing smaller areas and quotas that would result in harvests of demersal shelf rockfish in each regulatory area at levels no greater than those provided by the fishery management plan. The State regulations, however, apply only to vessels registered, or licensed, or both under the laws of the State of Alaska.

In view of an increase of proposed regulations like this one for groundfish, the NOAA Office of General Counsel recently

issued a memorandum (Johnson, 1988) cautioning NOAA Regional Attorneys about Federal regulations that purport to avoid supersession of State laws that have extraterritorial effect. The memorandum notes that "aside from the very real difficulty of determining what, if any effect, the issuance of the Federal regulations would have on the fishermen now and in the future, such a broad statement [deferring regulation of a fishery to the State] appears to substantially diminish the responsibility of the Councils and the Secretary to manage the fisheries on a regional basis." One interpretation of the memorandum is that State regulations of fisheries in the EEZ would be allowed if the effects of those regulations were fully understood by the Council and the Secretary.

If approved, this method would reduce a lot of duplicative actions and paperwork within NMFS and NOAA, would eliminate the uncertainty connected with the filing of notices with the Federal Register, and, by providing a single source of notices and regulations, would eliminate confusion among the fishermen. In practice, the Council's involvement would be the same as it has been in recent years, and the fishery would operate as it has.

Alternative 2: Maintain the Status Quo.

Under this alternative, the salmon fisheries in the EEZ would continue to be managed and regulated the way they are now.

The Council might be able to speed up the present system by changing the way regulations are issued. Three possible alternative ways of promulgating regulations have been suggested. One lets a regulation become effective before it is filed with the Office of the Federal Register. Two others place the burden on the fishermen for determining what times and areas are open for salmon fishing and what the other salmon fishing regulations are.

Variation 1: Notify salmon fishermen of the regulations with news releases and radio messages.

Under this alternative, NMFS (in cooperation with ADF&G) would notify the fishermen of preseason and inseason management measures, and (when necessary) emergency orders by news releases, and by radio messages broadcast by NOAA's National Weather Service along with its weather forecasts and reports. The notices would be released and broadcast at least 24 hours before the regulations became effective, and the regulations would become effective when the notices and broadcasts say they will. The regulations could also be filed with the Office of the Federal Register as soon as practicable, if necessary or desirable.

Under the present ADF&G system, it issues news releases of pending changes to regulations and distributes those releases to a large mailing list of news media, State and Federal enforcement offices, fish processors, fishermen's associations, and other interested persons and businesses. ADF&G also telephones some contacts in the fishing industry and news media, who further disseminate the information. NMFS also sends out news releases to a large mailing list; in addition, it places announcements and news releases on the NMFS electronic bulletin board, which can be accessed by anyone with a telephone, a small computer, and a modem.

Recently, NMFS and the National Weather Service (NWS), have signed a Memorandum of Understanding (MOU) on broadcasting fishery regulations. This MOU allows NMFS to have the National Weather Service broadcast time-critical fishery regulations along with weather broadcasts. For Southeast Alaska, NWS broadcasts continuously from six very-high-frequency FM stations (VHF-FM), including Sitka and Yakutat, and twice a day each from upper sideband (USB) stations at Annette, Yakutat, and Kodiak. During the summer of 1988, NWS broadcast several salmon fishery notices, and a number of salmon fishermen attested they heard and understood the notices.

From a practical point of view, this method would provide timely notices to the salmon fishermen. Legally, there remains the question: will news releases and radio broadcasts satisfy the Federal requirements for actual notice? The burden would be on NMFS to ensure that everyone affected had received timely notice.

In November 1988, the Pacific Fishery Management Council adopted a variation of this alternative in the ninth amendment of its plan for managing the salmon fisheries off the coasts of Washington, Oregon, and California.

Variation 2: Announce changes to salmon fishing regulations by means of recorded telephone messages.

Under this alternative, NMFS would install several telephone hot lines that fishermen could call to hear recorded messages. The fisherman would have to assume that the salmon fishery in the EEZ was closed unless a recorded message told him differently. If he was unable to telephone, or if the line was busy, or if the playback machine was out of order, the fisherman would have to assume the fishery was closed. The burden would be on the fisherman to determine the current salmon fishing regulations.

The telephone line could be toll-free or regular. If regular, the cost of the telephone call would be another cost of fishing. NMFS would maintain the playback machines, enter the

messages, ensure that the messages were current, and ensure that the backup playback device would operate.

NMFS would supplement the recorded messages with its electronic bulletin board and cooperative news releases with ADF&G.

NMFS uses this system in Washington State for inseason management of the sockeye and pink salmon fisheries covered by the Fraser River Panel of the Pacific Salmon Commission. The NMFS Northwest Region and the Northwest Indian Commission maintain toll-free hot lines for recorded messages during the 4-to-5-month period of these salmon fisheries. The regulations (50 CFR 371.21) state that the "official notice" of the inseason orders is available from those telephone lines. The recorded messages are supplemented by news releases, by procedures of the Indian tribes, and by publication in the FEDERAL REGISTER "as soon as practicable after they are issued." The effective dates and times are those stated in the inseason notices. Because regulations implementing the Pacific Salmon Treaty involve a foreign affairs function, they are specifically exempted from sections 4 through 8 of the Administrative Procedure Act (APA).

It can be argued that the stocks of salmon subject to harvest by the troll fishery in the EEZ off Southeast Alaska are subject to the Pacific Salmon Treaty. It can also be argued that the regulations governing the troll fishery also help carry out the United States international obligations under the treaty and the Pacific Salmon Treaty Act. Thus, it can be argued those regulations involve a foreign affairs function and, as such, are exempt from sections 4 through 8 of the APA and the National Environmental Policy Act (Pacific Salmon Treaty Act of 1986, Section 7 (a)). Accordingly, the procedures being used to implement the Fraser River Panel's plan for managing the harvests of Fraser River pink and sockeye salmon should also be usable for managing the troll fishery in the EEZ off Alaska.

Variation 3. Provide actual notice to agents representing the fishermen, rather than to the fishermen directly.

It might prove feasible to require fishermen to appoint agents for notification of salmon fishing regulations, particularly inseason changes to regulations. If the Council made this a requirement of the plan and it were implemented, NMFS could provide actual notice to a relative few agents, and this notice might constitute sufficient notice for all fishermen. In practice, NMFS operates this way to issue closure notices to joint-venture fishermen in the Alaskan groundfish fisheries.

6.0 REFERENCES CITED

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