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CHAPTER III. PRODUCTION POLICIES AND TRENDS IN ALASKA AND WORLDWIDE

See the attached memorandum regarding "Overview of World Commercial Salmon Production" by Linda J. Snow of Legislative Research Agency.

Alaska State Legislature

Legislative Research Agency



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February 7, 1992

MEMORANDUM

TO: Senator Richard Eliason, Chairman
Senate Special Committee on International and Domestic Fisheries

FROM: Linda J. Snow *L. Snow*
Legislative Analyst

RE: Overview of World Commercial Salmon Production
Research Request 92.058 [REVISED]

You asked for information about world commercial salmon production (harvest). In particular, you asked for an overview of world production of farmed salmon, wild salmon and ranched salmon, and information about trends and policies of the major salmon-producing countries.

SUMMARY

World salmon production over the last decade has been characterized by a decline in wild salmon stocks and an increase in hatchery-bred (ranched) and farmed salmon production.¹ Farmed salmon production nearly doubled between 1988 and 1990, increasing from about 310 million pounds to over 600 million pounds. Commercial salmon catch increased only slightly during that time. In 1990, farmed salmon made up about 27 percent of world salmon production. The increased supply of salmon on the world market lowered the price of the fish. Lower salmon prices and rising operating costs have brought economic hardship to salmon-farming operations worldwide, although many farms remain competitive. Recent trends indicate a slight reduction of farmed salmon production. Lower prices have also adversely impacted commercial salmon-fishing operations worldwide.

¹In this memorandum, the term "ranched" salmon refers to salmon which are hatched in a hatchery facility and released into the ocean, regardless of whether they are harvested by the common property fishery or harvested as private property.

OVERVIEW OF WORLD COMMERCIAL SALMON PRODUCTION

This section begins with an assessment of the sources of data available about worldwide commercial salmon production. It is followed by a brief statistical overview of wild, ranched and farmed salmon production worldwide.

Data Sources

Commercial salmon production reporting takes place in many countries around the world. However, there is no uniformity in the recordkeeping and statistical reporting among the various countries. Some countries report live weight of fish, while others report cleaned weight. Some estimate production by sampling commercial landings, while others compile comprehensive catch statistics from all vessels. Different units of measure may be used in reporting (i.e., numbers of fish, pounds of fish, metric tons of fish), and rounding errors may occur in converting from one unit of measure to another. Reports are prepared for different time periods (i.e., calendar year vs. fiscal year). Some sources report preliminary estimates which may or may not be revised. Sometimes statistics gathered within the same agency are not consistent because reporting requirements and techniques have changed from year to year. Thus, we have not only found it difficult to obtain comparable international data, we have also found inconsistent data reported by different government entities for the same national salmon production.

To make the best use of available worldwide salmon production data, we used two criteria in our selection of data for this report. First, we obtained data from the primary source, or as close to the primary source as possible. Second, we used the same source for the data when possible to be consistent. We obtained the data in Table A from the Department of Fish and Game, Division of Fisheries Rehabilitation, Enhancement and Development (FRED) and Division of Commercial Fisheries, the primary source. We obtained the data in Table B from the *Bill Atkinson's News Report*, a respected industry news letter which discusses developments in world fish markets. Table B is a compilation of data from the United Nations Food and Agricultural Organization (FAO), and from *Salmon 2000*, produced by the Alaska Seafood Marketing Institute. Tables 1 and 2 (attached) were taken from *Salmon 2000*, produced by the Alaska Seafood Marketing Institute. Tables 1 and 2 are composites of several tables in that document. Inconsistencies may be visible between the tables used in this report; however, the basic trends in salmon production are apparent from the data.

Statistical Overview

Salmon production includes the harvest of wild and hatchery-bred (ranched) fish and the harvest of farmed fish. All species of Atlantic and Pacific salmon are ranched, and Atlantic salmon and the coho and chinook varieties of Pacific

salmon are farmed. Many countries which ranch salmon do not distinguish between ranched and wild fish in their statistics of commercial harvests.

Alaska's government hatchery salmon program tags a large percentage of hatchery-bred fish before their release into the ocean. Thus, when recovering tags from commercially caught salmon, a reasonably accurate estimate of the number of hatchery-bred fish caught in the commercial fishery can be made.

Table A gives number of pounds of commercial salmon harvested in Alaska by species and by hatchery and wild fish, from 1980 through 1990. The hatchery contribution to the commercial harvest has become increasingly important, amounting to nearly 23 percent of the commercial catch in 1990. Although the contribution of hatchery harvest for each species has grown, the contribution of hatchery-bred pink salmon is the most significant at over 45 percent of the 1990 commercial pink salmon harvest.

Table B presents the world commercial salmon harvest for the years 1985 through 1990. The table lists commercial salmon catch by species for United States, Canada and Japan, as well as worldwide farmed production. United States statistics include the Alaska harvest. The farmed salmon category includes production from all countries which farm salmon. The "other" category includes salmon commercially caught by countries not listed separately, such as Korea, U.S.S.R., and Poland. Although commercial salmon catch fluctuated between 1985 and 1990, it appears that the increase in worldwide salmon production during that time is due to an increase in farmed salmon production. According to this data source, farmed salmon harvest increased from about 159 million pounds in 1985 to over 600 million pounds in 1990.

Tables 1 and 2 (attached) present some detailed country information for commercial salmon production. This information was taken from *Salmon 2000*, by the Alaska Seafood Marketing Institute. Table 1 presents worldwide harvest of wild and ranched salmon for 1980 through 1990. Note that only three years worth of Soviet commercial salmon catch are reported.

Table 2 presents worldwide farmed salmon production for 1980 through 1990. According to the source, farmed salmon production has increased dramatically from 15.7 million pounds in 1980 to 621.0 million pounds in 1990. Norway is the world's largest farmed salmon producer, harvesting 330.0 million pounds in 1990, over half the worldwide production.

TABLE A
Hatchery and Wild Salmon Commercial Harvest in Alaska, 1980 - 1990
(In thousands of pounds)

	Chinook	Sockeye	Coho	Pink	Chum	Total
1980 Commercial Harvest						
Wild Fish	11,478.3	186,842.7	21,845.2	209,492.9	70,852.2	500,511.3
Hatchery Fish	521.7	157.3	154.8	7,507.1	147.8	8,488.7
Total Harvest	12,000.0	187,000.0	22,000.0	217,000.0	71,000.0	509,000.0
Hatchery Contribution	4.35%	0.08%	0.70%	3.46%	0.21%	1.67%
1981 Commercial Harvest						
Wild Fish	14,963.2	234,678.0	25,630.8	228,186.8	98,850.9	592,309.8
Hatchery Fish	36.8	322.0	369.2	15,813.2	149.1	16,690.2
Total Harvest	15,000.0	225,000.0	26,000.0	244,000.0	99,000.0	609,000.0
Hatchery Contribution	0.25%	0.14%	1.42%	6.48%	0.15%	2.74%
1982 Commercial Harvest						
Wild Fish	15,981.1	188,822.9	45,345.0	198,509.5	89,179.8	537,838.3
Hatchery Fish	18.9	177.1	855.0	20,490.5	820.2	22,161.7
Total Harvest	16,000.0	189,000.0	46,000.0	219,000.0	90,000.0	560,000.0
Hatchery Contribution	0.12%	0.09%	1.42%	9.36%	0.91%	3.96%
1983 Commercial Harvest						
Wild Fish	14,962.7	304,080.1	25,423.0	176,128.7	77,351.9	597,946.5
Hatchery Fish	37.3	919.9	577.0	16,871.3	1,648.1	20,053.5
Total Harvest	15,000.0	305,000.0	26,000.0	193,000.0	79,000.0	618,000.0
Hatchery Contribution	0.25%	0.30%	2.22%	8.74%	2.09%	3.24%
1984 Commercial Harvest						
Wild Fish	11,852.1	220,523.7	42,846.7	260,732.8	92,040.0	627,995.2
Hatchery Fish	147.9	1,476.3	1,153.3	15,267.2	11,960.0	30,004.8
Total Harvest	12,000.0	222,000.0	44,000.0	276,000.0	104,000.0	658,000.0
Hatchery Contribution	1.23%	0.67%	2.62%	5.53%	11.50%	4.56%
1985 Commercial Harvest						
Wild Fish	12,646.6	218,305.3	45,033.4	260,585.5	74,452.1	611,022.9
Hatchery Fish	353.4	2,694.7	1,966.6	43,414.5	8,547.9	56,977.1
Total Harvest	13,000.0	221,000.0	47,000.0	304,000.0	83,000.0	668,000.0
Hatchery Contribution	2.72%	1.22%	4.18%	14.28%	10.30%	8.53%
1986 Commercial Harvest						
Wild Fish	10,837.6	191,159.2	42,973.1	231,847.2	86,419.8	563,036.9
Hatchery Fish	362.4	4,840.8	3,026.9	27,152.8	11,580.2	46,963.1
Total Harvest	11,000.0	196,000.0	46,000.0	259,000.0	98,000.0	610,000.0
Hatchery Contribution	3.29%	2.47%	6.58%	10.48%	11.82%	7.70%
1987 Commercial Harvest						
Wild Fish	11,434.7	209,697.0	21,462.3	89,918.2	66,559.3	399,071.4
Hatchery Fish	565.3	5,303.0	1,537.7	69,061.8	11,440.7	87,928.6
Total Harvest	12,000.0	215,000.0	23,000.0	159,000.0	78,000.0	487,000.0
Hatchery Contribution	4.71%	2.47%	6.69%	43.45%	14.67%	16.06%
1988 Commercial Harvest						
Wild Fish	9,276.3	177,420.0	31,737.1	131,921.2	103,906.5	454,261.0
Hatchery Fish	723.7	7,580.0	1,262.9	44,078.8	17,093.5	70,739.0
Total Harvest	10,000.0	185,000.0	33,000.0	176,000.0	121,000.0	525,000.0
Hatchery Contribution	7.24%	4.10%	3.83%	25.04%	14.13%	13.47%
1989 Commercial Harvest						
Wild Fish	9,296.7	253,818.3	27,840.0	246,819.3	50,790.5	588,564.9
Hatchery Fish	703.3	8,181.7	2,160.0	104,180.7	7,209.5	122,435.1
Total Harvest	10,000.0	262,000.0	30,000.0	351,000.0	58,000.0	711,000.0
Hatchery Contribution	7.03%	3.12%	7.20%	29.68%	12.43%	17.22%
1990 Commercial Harvest						
Wild Fish	9,041.7	291,493.6	28,537.8	145,284.9	48,855.9	521,214.0
Hatchery Fish	958.3	17,506.4	4,462.2	119,715.1	11,144.1	153,786.0
Total Harvest	10,000.0	309,000.0	33,000.0	265,000.0	58,000.0	675,000.0
Hatchery Contribution	9.58%	5.67%	13.52%	45.18%	19.21%	22.76%

Note: Data includes "cost recovery" harvest, but does not include "broodstock" harvest.

Sources: Alaska Department of Fish and Game, Division of Fisheries Rehabilitation, Enhancement and Development, and Division of Commercial Fisheries.

Prepared by the Legislative Research Agency, February 1992 (92.058A).

TABLE B
World Salmon Commercial Harvest, 1985 – 1990
(in millions of pounds)

Species	1985	1986	1987	1988	1989	1990
United States						
Sockeye	235.9	211.6	227.1	189.6	271.2	321.9
Pink	319.7	269.0	169.8	167.5	363.8	264.6
Chum	92.6	86.0	86.0	134.5	63.9	70.5
Coho	52.9	59.5	39.7	46.3	41.9	44.1
Chinook	26.5	30.9	39.7	46.3	37.5	22.0
Total United States	727.5	657.0	562.2	584.2	780.4	723.1
Canada						
Sockeye	70.5	66.1	33.1	26.5	75.0	81.6
Pink	83.8	63.9	59.5	70.5	68.3	57.3
Chum	52.9	55.1	22.0	66.1	19.8	37.5
Coho	19.8	26.5	17.6	15.4	19.8	24.3
Chinook	13.2	8.8	11.0	13.2	11.0	11.0
Total Canada	240.3	220.5	143.3	191.8	194.0	211.6
Japan						
Fall Chum	330.7	310.4	282.7	308.2	350.3	363.8
High Seas Fishery	224.9	164.5	124.7	85.7	114.5	78.9
Total Japan	555.6	474.9	407.4	393.9	464.8	442.7
Farmed						
Atlantic	133.4	147.5	248.0	358.0	464.1	474.0
Pacific (Coho & Chinook)	25.6	39.0	62.2	89.9	104.7	127.9
Total Farmed	159.0	186.5	310.2	448.0	568.8	601.9
Other	265.3	0.0	0.0	110.0	80.5	76.3
TOTAL	1,947.6	1,538.9	1,423.1	1,727.9	2,088.6	2,055.6

Sources: Taken from Bill Atkinson's News Report. Original sources listed as United Nations Food and Agricultural Organization (U.S., Canada and farmed data) and Alaska Seafood Marketing Institute, Salmon 2000 (world totals).

Note: The original table was in metric tons.

Prepared by the Legislative Research Agency, February 1992 (#2.0588).

POLICIES AND TRENDS OF MAJOR SALMON PRODUCING COUNTRIES AND REGIONS

The countries and regions which commercially harvest the largest quantities of wild and hatchery-bred ranched salmon are the United States (Oregon, Washington and Alaska), Canada (British Columbia), Japan and the U.S.S.R. Other areas have experimented with salmon ranching, but as yet produce few fish. Major salmon-farming industries are located in Norway, Scotland, Chile, U.S. and Japan. Iceland, the Faroe Islands, Ireland, Australia, New Zealand and France also farm salmon but are not considered major producers. The following overview presents a brief description of current trends in salmon production in the major producing countries and regions.

United States

Alaska's commercial salmon catch accounts for about 90 percent of U.S. commercial salmon harvest. Washington, Oregon and California have commercial chinook and coho fisheries, and Washington and Oregon state governments engage in salmon ranching. Private companies farm salmon commercially in Washington, Maine, Oregon, Minnesota and Idaho. Most U.S.-produced farmed salmon comes from farms in Washington and Maine. Experimental salmon farms are operating in Hawaii and California, but no substantial commercial harvest of the salmon has yet occurred.

In 1990, the Alaska commercial catch of salmon was 675 million pounds. Of that catch, about 23 percent was hatchery-bred salmon. Hatchery pink salmon made up over 45 percent of Alaska's commercial pink catch in 1990, while hatchery sockeye salmon made up only slightly over 5 percent of Alaska's commercial catch. Alaska has no salmon-farming operations.

Commercial salmon catch in Washington has dropped from 68.6 million pounds in 1985 to 36.1 million pounds in 1990. The Washington state government operates about 50 salmon hatcheries, which produce nearly 60 percent of the state's commercial salmon catch (about 21.7 million pounds in 1990). The hatcheries produce mostly chinook and coho salmon, but some chum, pinks and sockeye are hatchery-bred as well. Although the program is expanding slightly, very few new hatchery facilities are being developed. The Washington state government attempts to manages its fisheries to protect the wild stocks, and the hatcheries are meant to enhance and not replace the natural runs. Washington has some profitable private salmon farms, but several had financial trouble last year when algae blooms killed many fish.

Oregon's commercial salmon catch fell dramatically in 1990. The five-year average commercial salmon harvest (1986 - 1990) was 11.9 million pounds. The 1990 harvest was only 5.2 million pounds. Oregon produces 69 percent of its commercial coho catch in 34 state-owned hatcheries and one privately owned hatchery. Ranched fish make up about 25 percent of the coastal chinook commercial catch, and 85 percent of the Columbia River kings caught commercially are from hatcheries. Oregon also hatches and releases some chum

and pink salmon. The state hatchery program has undergone slight expansion recently, funded by federal money. The Oregon Department of Fish and Wildlife attempts to manage the state fishery to minimize negative impact on wild stocks, and hatchery fish supplement the natural runs.

Canada

British Columbia (B.C.) is the only Canadian province with a substantial commercial salmon fishery. The 1990 catch of 191.4 million pounds was slightly higher than the five-year average (1986 - 1990) catch of 187.7 pounds. In recent years, B.C. hatcheries have produced about 12 to 16 percent of the salmon commercially caught off Canada's west coast (between 25 and 34 million pounds in 1990). No new government hatcheries have been built in the past five years. The Canadian government spends about \$40 million (Canadian dollars) per year for B.C. hatchery operation. British Columbia hatcheries concentrate on chinook and coho salmon; they produce very few pink salmon. Between 20 and 30 percent of the chinook and coho catch is hatchery-bred, and 12 to 16 percent of the sockeye and chum catch is from hatcheries. The government management policy favors wild stocks, and hatcheries are for enhancement, not replacement, of the natural runs.

All Canadian salmon farms are privately owned and operated. Canadian farms produced 51 million pounds of salmon in 1990, nearly one-quarter the amount of commercially caught Canadian salmon on the market. New Brunswick, Newfoundland, Nova Scotia and Quebec all engage in Atlantic salmon farming. There are about 89 farms, most of which are located in New Brunswick. In Canada's Atlantic region, expansion has slowed because the government has limited the number of licenses for farms. British Columbia began farming in 1972, and in 1984, private Norwegian companies began investing in Canadian farms. Norwegian investment now amounts to about one-third the value of all B.C. salmon farms. Recent financial trouble due to lower prices for farmed salmon and increased operations costs has contributed to several bankruptcies of farms in B.C. However, Canadian farmed salmon is increasingly filling the U.S. market niche vacated by Norwegian farmed salmon, which is high priced due to the recent implementation of U.S. import duties. Thus, the economic future of Canadian farmed salmon looks good. British Columbia farms produce mostly chinook and Atlantic salmon, but production of farmed coho is developing. The B.C. government began to take a hand in the regulation of farms and research and development of farming technology in 1989 to help foster rapid development. Canadian farms anticipate production of 145 million pounds by the year 2000.

Japan

Commercial catch of salmon by Japanese fishermen has historically come from two fisheries, the high seas drift net fishery, and the coastal set net fishery. Japan has worked to be self-sufficient in supplying its country's demand for salmon. As the high seas fishery became increasingly unprofitable due to

political and environmental pressures, the Japanese government decided to supplement the coastal fishery with hatchery production. The coastal set net fishery now supplies about half the Japanese salmon demand.

Japan has a very ambitious and successful hatchery program. The national government operates its own hatcheries, and subsidizes private ones. In 1980, 58 percent of the commercial fall chum catch off the coast of Japan was hatchery-bred fish. Today, about 85 percent of the coastal catch (about 309 million pounds in 1990) is bred in hatcheries. Japanese hatcheries produce chum, pink, cherry and sockeye salmon. The number of salmon hatcheries in Japan is still increasing. In the Hokkaido area, only about 1 percent of the salmon is wild; the rest are hatchery chums. In the Honshu area, about 80 percent of the chum catch is hatchery reared. There are no longer any native chinook or sockeye salmon in Japanese waters, and few native pink and cherry salmon.

As the high seas catch declines, salmon imports have risen to meet Japanese demand for salmon. The Japanese are experimenting with fish farming to further supply their markets and decrease national reliance on imports. Private firms are developing floating coho farms and experimenting with chinook and Atlantic salmon farms. Farmed salmon production in Japan has increased to 57.2 million pounds in 1990. Farmed coho that cannot be sold fresh are salted rather than frozen.

U.S.S.R.

Information about historic commercial salmon catch by the U.S.S.R. is difficult to obtain. The first Soviet hatcheries were built on Sakhalin Island, with one or two on the Amur River. The Japanese developed hatcheries on the southern part of Sakhalin Island while they occupied that area in the early 1900s. The Soviets inherited those hatcheries when Japan ceded south Sakhalin to the U.S.S.R. after World War II. The Soviets are currently expanding hatchery operations to the Kamchatka Peninsula. They intend to increase hatchery production to bring commercial catch from about 375 million pounds to 661 million pounds. Soviet fishery policy does not mandate protection of wild salmon stocks. Movement of stocks and the possibility of genetic intermingling does not seem to concern the Soviet government.

Soviets are experimenting with salmon farms, although little production has resulted. Perestroika has caused some reorganization of the Soviet fishing industry, and Soviet companies have entered into international joint ventures which will allow them access to new salmon fishing areas in the north Pacific. Recent political developments in the Soviet Union may slow advancements in the fish propagation field in that country in the immediate future.

Norway

Norway's historic wild run of Atlantic salmon has been severely depleted from over fishing. The country began farming Atlantic salmon in the 1960s, and production has increased rapidly since then. In 1990 there were approximately 790 privately owned farms in Norway, providing half the world supply of farmed salmon, and 14 percent of the world supply of salmon. Norway exports about 85 percent of its farmed salmon. The Norwegian government has supported the salmon farming industry through loans, research and technical assistance and regulation. Government policy has limited the size of private farms, and the number of farms a company may operate, and thus has encouraged exportation of salmon-farming technology.

The phenomenal growth of farmed salmon production in Norway and other countries has altered the economics of the world salmon market. As the supply of fresh salmon on the world market increased, the price fell, and some farms became unable to meet their production costs. The Norwegian government is now encouraging a slowdown in farmed salmon production and has placed a cap of approximately 286 million pounds for 1991, down from 330 million pounds in 1990. In recent years, Norwegian firms have been accused of flooding the market with farmed salmon. A quasi-governmental industry organization has begun buying excess production and freezing it for future sales (about 88 million pounds in 1990). Private Norwegian farming companies are now investing heavily in salmon farms in Scotland, Canada, the U.S. and Chile. The U.S. has recently imposed an import tariff (anti-dumping and countervailing duties) on Norwegian farmed salmon, which ranges from about 15 percent to 32 percent, depending on the exporting company. The duty has decreased U.S. imports of Norwegian farmed salmon to about ten percent of U.S. fresh Atlantic salmon imports, compared to 61 percent of U.S. imports in 1989. Canadian and Chilean farmed salmon imports to the U.S. now supply the markets lost to Norwegian fish.

Scotland

Scottish production of farmed Atlantic salmon has been steadily increasing since the early 1980s. Scotland has about 290 farms in sheltered areas along the coast which produced 77.0 million pounds in 1990, second only to the production of Norwegian farms. Half the production is exported. Currently, Scottish farms are experiencing financial difficulties as costs are up and salmon prices have fallen. Seven farming companies in Scotland went bankrupt last year. This year there is a decrease in smolt production. Farms have also seen increasing losses from disease recently. Only two of three fish are surviving until harvest, a 10 percent decline in survival from recent years. The British government has been supportive with financing and is currently helping with a re-evaluation of the market for Scottish farmed salmon.

Chile

Chile began salmon farming on a small scale in the 1970s. There was a slow expansion of farming until 1988, when production took a large jump. Approximately 320 private Chilean farms produced 41.8 million pounds of salmon in 1990. Fish farming is Chile's fastest growing economic activity. First coho were farmed; now Atlantic salmon, chinook salmon and salmon trout are being farmed. Chileans are currently developing sockeye and cherry salmon farms. Chile has no native salmon, but the habitat is similar to that of the Norwegian coast and is perfect for their propagation. Chilean firms are experimenting with ocean ranching of salmon, which so far has not proven successful.

Chilean farms produce high quality salmon. Because Chile is a major world fish meal producer, feed costs are low, allowing farmers to lower stock densities in pens, resulting in healthier fish. The major drawback to Chilean farmed salmon success is the distance to major markets. Transportation costs increase the retail price of Chilean fish by as much as \$.75 per pound. However, through superior quality, Chile has obtained strong markets and can compete even in the face of declining prices. Chilean salmon producers have gained markets in the U.S. because of import duties on Norwegian farmed salmon. About 97 percent of Chilean farmed salmon is frozen for market. The Japanese are investing heavily in Chilean salmon farms. Chilean farms are privately owned and they operate with little government regulation or economic intervention. The farmers work together to set prices and quality restrictions.

Other Salmon-Producing Regions

Other regions which artificially propagate salmon are Korea, Iceland, the Faroe Islands, Ireland, Australia, New Zealand, France, Sweden, Finland, Spain and Italy. Korea does some salmon ranching, as does Iceland and New Zealand. The Faroe Islands, Ireland, Iceland, Australia and New Zealand have small and successful salmon-farming operations. The other regions are in the process of developing salmon-farming technology.

I hope this information is helpful to you. If you need further assistance, please don't hesitate to call this agency.

Attachments

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**World Wild and Ranched Salmon Harvest
from Major Fishing Countries and World
Farmed Salmon Productions**

TABLE 1
World Wild and Ranched Salmon Harvest
From Major Fishing Countries
(millions of pounds)

Year	Canada	Japan	U.S.S.R	Alaska	Other U.S.A.	Total*
1980	118.0	284.0		512.0	48.0	962.0
1981	173.0	344.0		611.0	61.0	1,189.0
1982	144.0	314.0		562.0	67.0	1,087.0
1983	164.0	367.0		621.0	31.0	1,183.0
1984	110.0	359.0		660.0	34.0	1,163.0
1985	236.0	460.0		669.0	78.0	1,443.0
1986	228.0	389.0	176.0	606.0	72.0	1,471.0
1987	143.0	397.0		490.0	73.0	1,103.0
1988	191.0	373.0		527.0	80.0	1,171.0
1989	185.0	478.0	173.8	714.0	73.0	1,623.8
1990	191.4	484.0	286.0	678.7	44.4	1,684.5

*Totals may not be accurate due to missing years of U.S.S.R. catch data.

Note: The numbers may not always appear exactly as in the source document. These differences are due to rounding and discrepancies between original sources.

Sources: Salmon 2000, Alaska Seafood Marketing Institute, March 1991, unless otherwise indicated. Canadian data from page 37, Japanese data from page 38, U.S.S.R. data from page 17, Alaska and Other U.S.A. data from page 35, 1990 Canadian and Japanese data from page 17. 1990 Alaska and Other U.S.A. data from Bill Atkinson's New Report.

Prepared by the Legislative Research Agency, February 1992 (92.058C).

TABLE 2
World Farmed Salmon Production
(millions of pounds)

Year	Norway	Scotland	Chile	Canada	U.S.	Japan	Other	Total
1980	9.1	1.3	0.0	0.4	0.9	4.0	0.0	15.7
1981	18.5	2.9	0.0	0.5	1.9	2.5	0.0	26.3
1982	22.6	4.7	0.4	0.9	1.5	4.7	0.0	34.8
1983	37.4	5.6	0.2	0.7	0.8	3.9	0.0	48.6
1984	49.0	8.6	0.2	0.7	2.7	11.0	1.8	74.0
1985	63.0	15.0	1.1	0.9	4.0	14.1	3.9	102.0
1986	100.5	22.7	2.5	2.2	3.0	17.6	7.5	156.0
1987	123.6	27.9	2.6	6.0	5.5	26.8	17.6	210.0
1988	184.0	39.5	6.8	20.0	8.1	36.0	24.6	319.0
1989	252.7	68.2	18.0	38.8	12.3	40.9	48.1	479.0
1990	330.0	77.0	41.8	51.2	16.9	57.2	46.9	621.0

Note: The numbers may not always appear exactly as in the source document. These differences are due to rounding and discrepancies between original sources.

Source: Salmon 2000, Alaska Seafood Marketing Institute, March 1991. Body of the table is the bottom table on page 14, and the totals are from the top table on page 14 with some adjustments to avoid having negative numbers in the Other column.

Prepared by the Legislative Research Agency, February 1992 (92.058D).