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ANNEX TO THE
**WORLDWIDE FISHERIES
MARKETING STUDY:**
PROSPECTS TO 1985

SALMON



Government
of Canada

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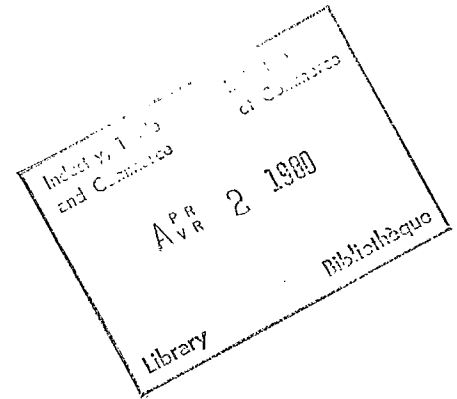
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Canada. Dept. of Fisheries and Oceans. Fisheries Economic Development & Marketing.
Marketing Services Branch.

(This Report is one of a series of country and species annexes
to the main study - entitled the Overview).



D R A F T

Annex to the
Worldwide Fisheries Marketing Study:
Prospects to 1985

SALMON [v. 17]

D.B. McEachern
Department of Fisheries and Oceans

October, 1979

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The views expressed in this Study, however, are ours alone and reflect the Canadian perception of worldwide markets.

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FOREWORD

As a consequence of global extension of fisheries jurisdictions, a radical shift has taken place in the pattern of worldwide fish supply and demand. This change is still going on and will continue for many years before an equilibrium situation is reached. However, in the midst of this re-adjustment, a new trade pattern is emerging -- some net exporting countries are now importing and vice versa. In the longer term, some countries will experience shortages of supply and others will have a surplus. Fortunately, Canada is amongst the latter group.

The implications for the marketing of Canadian fisheries products arising from the worldwide introduction of the 200-mile limit are extensive. With our vastly improved supply position relative to world demand, government and industry are understandably concerned about ensuring that the bright promise of increased market opportunities are real and can be fulfilled. One of the steps in this process is the publication of the Worldwide Fisheries Marketing Study which assesses the potential on a country and species basis.

Specifically, the purpose of the Study is to identify the short (1981) and longer-term (1985) market opportunities for selected traditional and non-traditional species in existing and prospective markets. In this initial phase, 14 country markets and 8 species groups are analysed. It should be noted that while the information contained in the Reports was up-to-date when collected during March-June 1979, some information may now be dated given the speed with which changes are occurring in the marketplace. In this same vein, the market projections to 1981 and 1985 should be viewed with caution given the present and still evolving re-alignment in the pattern of international fisheries trade, keeping in mind the variability of key factors such as foreign exchange rates, energy costs, bilateral fisheries arrangements and the recently concluded GATT-MTN agreements which have a direct effect on trade flows.

Notwithstanding, the findings contained in these Reports represent an important consolidation of knowledge regarding market potential and implications for improvements in our existing marketing and production practices.

Thus, the results of the Study should usefully serve as a basis for planning fisheries development and marketing activities by both government and industry in order to capitalize on the identified market opportunities.

This draft Report is published for discussion purposes and as such we invite your critical comments.

Ed Wong

Marketing Services Branch
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Department of Fisheries and Oceans

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A. Introduction

Canada's Salmonid Fisheries can be broken into two types, west coast salmon referred to as Pacific salmon and east coast salmon called Atlantic salmon. Both salmonid groups are anadromous, spending a great deal of life at sea and returning only to fresh water for spawning. The scientific name for Atlantic salmon is *Salmo salar*, while Pacific salmon are composed of five distinct species from the genus *Oncorhynchus*. In contrast to the Pacific salmon which spawn only once, Atlantic salmon may spawn a number of times. Each type supports both a recreational and commercial fishery and is distributed widely in domestic and foreign markets.

A-I Atlantic Salmon

Atlantic salmon are found on both sides of the North Atlantic. Over the past 50 years, they have declined in number on both sides of the Atlantic Ocean. Historically, Atlantic salmon occurred in great numbers in Greenland, Iceland, the Scandinavian countries, the White Sea area of northwestern Russia, the Baltic, the British Isles, France, Spain and Portugal. In Europe, salmon have been severely depleted in the more southerly countries. Throughout both the United States of America, Canada, and various countries of Europe, efforts are now being directed to revitalize the stocks.

The commercial fishery for Atlantic salmon in Canada was severely curtailed in 1972 when a ban was put on commercial fishing in all of New Brunswick and parts of the Gaspé Bay Peninsula in Quebec. As well the drift net fishery off Port-aux-Basques,

Newfoundland, was terminated that year. At present, commercial fishing for Atlantic salmon in Canada is only permitted in tidal waters with trap-nets or gill nets. Currently a new management program for the commercial fishery in Atlantic Canada is being developed.

TABLE 1 - WORLD ATLANTIC SALMON LANDINGS, 1974 - 1977

	1974	1975	1976	1977
	(Metric Tons Round Weight)			
<u>Europe - Inland Waters</u>				
Denmark	---	---	---	---
Finland	25	55	93	103
Iceland	225	266	225	230
Norway	---	---	---	---
Sweden	0	0	0	0
U.K. (England & Wales)	1,896	---	---	---
Sub Total	2,146	321	318	333
<u>N. West Atlantic - West of 59° N.</u>				
Canada	2,221	2,218	2,196	2,116
Denmark	505	381	---	---
Faroe Is.	110	260	---	0
Greenland	1,162	1,187	1,175	1,414
Norway	140	220	---	---
St. Pierre & Miquelon	---	---	1	---
U.S.A.	0	0	0	0
Sub Total	4,138	4,266	3,372	3,530
<u>N. East Atlantic - East of 59° N.</u>				
Denmark	1,385	1,467	1,685	1,214
Faroe Is.	---	28	40	40
Finland	747	697	688	699
France	1	4	2	---
Germany Fed.	53	74	65	36
Greenland	---	---	---	6
Ireland	2,068	2,136	1,449	1,305
Norway	1,399	1,284	1,099	1,179
Poland	119	88	103	80
Portugal	17	0	0	0
Sweden	665	644	623	672
U.S.S.R.	1,926	1,345	213	344
U.K. (England, Wales)	400	358	---	---
U.K. (Scotland)	1,232	1,243	790	1,131
U.K. (Ireland)	184	164	114	111
Sub Total	10,196	9,532	6,873	6,817
World Total	16,480	14,119	10,563	10,680

Area breakdowns refer to major fishing statistical areas as defined by the Food and Agriculture Organization (FAO) of the United Nations.

Source: - F.A.O., Yearbook of Fishery Statistics, Catches and Landings, vol.44, Table B-23, Rome, Italy, 1978.

A-II Pacific Salmon

The five Pacific salmon species are sockeye (*Oncorhynchus nerka*), pink (*Oncorhynchus gorbuscha*), chum (*Oncorhynchus keta*), coho (*Oncorhynchus kisutch*), and chinook (*Oncorhynchus tshawytscha*). There is another species found only in Asia called cherry salmon (*Oncorhynchus masou*).

The sockeye salmon is relatively small in size, averaging six pounds and is prized for its rich red, firm flesh. It is the species upon which the B.C. canning industry was historically built but is now becoming popular in frozen markets. This species has a life cycle of four to six years and is caught predominantly with net gear. Recently, trollers have caught increasing quantities. Troll caught sockeye and other salmon is generally superior in quality to net caught and therefore commands higher prices at the fisherman and wholesale level.

The pink salmon is the smallest of the five species, averaging four pounds, but is the most abundant in many seasons. It has a life cycle of two years. Although noted for its flavour, the pink, in the past, has been marketed almost exclusively in canned form. It is usually caught with net gear, although trollers have been effective in catching this species in some years.

The chum salmon is quite large, averaging eleven pounds. Though historically used widely for canning, a unique feature of this species is that the flesh deteriorates rapidly when it enters fresh water, whereas when caught in salt water much of it is in the "silverbright" stage and is suitable for the fresh frozen consumer market. The life cycle ranges from three to five years. The chum is most often taken on net gear.

The coho salmon is red in colour like sockeye and averages six and one half pounds. It has a life cycle of three or four years. The majority of coho are taken on troll gear and enter the fresh/frozen market.

The chinook salmon is the largest of the five species, averaging from twelve to twenty pounds but going to over one hundred pounds. It has a life cycle of four to seven years. It also has the most diverse flesh characteristics, being white, pink or red in colour. Historically it made poor canning fish and was primarily used in fresh/frozen forms. Although it can be caught on any gear type, it is most often taken by troll gear.

World Pacific salmon landings in total averaged 400 thousand tonnes during the years from 1974 to 1977. The 1977 catch was higher than the previous three years at 469 thousand tonnes (Table 2). World landings in the 1960's averaged 405 thousand tonnes, a slight decline from the 1950's average of 460 thousand tonnes.

There are four major salmon producing countries: Japan, United States, Canada, and the U.S.S.R. They supply markets in their own and other producing countries as well as in the main importing countries including the United Kingdom, France, Belgium, Luxembourg, Netherlands, Italy, other E.E.C. countries, Scandinavia, Australia and New Zealand.

In the five years from 1973 to 1977, Japan accounted for the highest production - 34.4 percent of the average annual catch - followed by United States at 29.7 percent, the U.S.S.R. at 22.0 percent and Canada at 13.9 percent. In 1977 Japan dropped to the third position at 120.2 thousand tonnes while the U.S.S.R. at 131.1 thousand tonnes was the second highest producer.

The world catch is made up mostly of pink salmon accounting for 39.6 percent of the annual average (73 to 77) followed by chum at 30.6 percent, sockeye at 13.5 percent, coho at 9.0 percent, and chinook at 6.4 percent.

TABLE 2 - WORLD PACIFIC SALMON LANDINGS
BY COUNTRY AND SPECIES 1974 - 1977

		(Metric Tons, Round Weight)				1974-1977 AVERAGE	%
		1974	1975	1976	1977		
JAPAN	Pink	32,537	45,936	29,629	35,264	35,841	
	Chum	80,146	99,485	78,417	71,931	82,495	
	Cherry	3,101	3,871	3,814	3,822	3,652	
	Sockeye	8,155	7,733	8,844	4,499	7,308	
	Chinook	1,867	1,115	1,604	908	1,374	
	Coho	9,713	8,161	7,697	3,757	7,332	
	Total	135,519	166,301	130,005	120,181	138,002	34.4
USSR	Pink	32,100	88,415	53,748	107,496	70,440	
	Chum	9,200	7,691	10,015	14,678	10,396	
	Sockeye	1,000	1,399	1,170	1,869	1,359	
	Chinook	1,800	2,229	1,956	3,099	2,271	
	Coho	3,900	3,310	3,556	4,009	3,694	
	Total	48,000	103,044	70,445	131,151	88,160	22.0
USA	Pink	18,182	25,492	45,014	56,992	36,420	
	Chum	19,227	15,330	23,880	26,036	21,118	
	Sockeye	22,125	23,734	37,721	40,793	31,093	
	Chinook	12,844	14,176	15,654	14,822	14,374	
	Coho	19,010	12,710	18,603	13,604	15,832	
	Total	91,388	91,442	140,272	152,247	118,837	29.7
CANADA	Pink	11,207	10,239	17,056	24,723	15,806	
	Chum	12,479	5,389	10,922	6,032	8,706	
	Sockeye	21,694	5,681	12,339	17,388	14,276	
	Chinook	7,637	7,289	7,776	7,522	7,556	
	Coho	10,378	7,737	9,322	9,857	9,324	
	Total	63,395	36,335	57,415	65,522	55,668	13.9
WORLD TOTAL	Pink	94,026	170,082	145,447	224,475	158,508	39.6
	Chum	121,052	127,895	123,234	118,677	122,715	30.6
	Cherry	3,101	3,871	3,814	3,822	3,652	.9
	Sockeye	52,974	38,547	60,074	64,549	54,036	13.5
	Chinook	24,148	24,809	26,990	26,351	25,575	6.4
	Coho	43,001	31,918	38,578	31,227	36,181	9.0
	Total	338,302	397,122	398,137	469,101	400,667	100.0

Source: - F.A.O. Yearbook of Fishery Statistics, Catches and Landings,
Vol.44, B-23 Table, Rome, Italy, 1978.

Historically, salmon production from countries other than Canada has been declining about 1.8 percent annually. There are however, salmonid enhancement programs in Washington, Oregon, Alaska, Japan, the U.S.S.R., and other East Asian countries. It is possible that these programs could increase non-Canadian output as much as 2.0 percent annually or 6 percent (23.8 thousand tonnes) by 1981, and 14 percent (55.4 thousand tonnes) by 1985.

In 1978, B.C. Pacific salmon landings were 70.6 thousand tonnes consisting of 15.8 thousand tonnes of chum, 15.3 thousand tonnes of pink, 9.1 thousand tonnes of coho, 22.3 thousand tonnes of sockeye, and 7.9 thousand tonnes of chinook salmon. The quantities landed of each species vary considerably from year to year especially for sockeye, pink and chum salmon.

B.C.'s salmon landings have declined over the years, with the average catch for the 1970-77 period over one-third less than the average for the 1925-35 period. In recent years the downward trend appears to have stopped, and with enhancement programs should be reversed.

The bulk of Canada's supplies of sockeye and pink salmon have historically been canned. In recent years frozen products are becoming important for these species (Table 3). The reason for this shift in product mix is that wholesale prices have been shifting consistently in favour of the fresh and frozen product, (Table 4)^{1/}.

Chum, chinook and coho are used for both canning and freezing. Frozen salmon products are exported and further processed, in the importing country. Fresh salmon consumption is important especially in the domestic market, but also increasingly for exports. Mild cured salmon and smoked salmon are also produced in B.C. along with small quantities of specialty salmon products such as pickled and steamed.

^{1/} In addition, prior to 1966 there was an embargo on the export of fresh and frozen sockeye and pink salmon. The regulation was retracted in that year.

TABLE 3 - UTILIZATION OF BRITISH COLUMBIA SALMON
(000 Tonnes)

<u>PERIOD OR YEAR</u>	<u>CANNED</u>	<u>%</u>	<u>OTHER</u>	<u>%</u>
1952 - 1955	52.2	70.2	22.2	29.8
1956 - 1959	45.2	72.9	16.8	27.1
1960 - 1963	41.2	73.6	14.8	26.4
1964 - 1967	44.6	74.1	15.6	25.9
1968	57.2	69.2	25.4	30.8
1969	20.4	54.0	17.4	46.0
1970	46.5	64.1	26.0	35.9
1971	45.5	72.1	17.6	27.9
1972	37.8	39.1	58.9	60.9
1973	50.4	58.2	36.2	41.8
1974	45.9	72.5	17.4	27.5
1975	-	-	-	-
1976	32.9	57.3	24.6	42.7
1977	41.1	62.7	24.5	37.3
1978	35.9	50.8	34.7	49.2

Source: Calculated from statistics published by the Economics and Statistics Section, Fisheries and Oceans Canada, Vancouver, B.C.

TABLE 4 - TRENDS IN REAL WHOLESALE PRICES* OF
CANADIAN SALMON BY SPECIES AND PRODUCT TYPE
OVER THE PERIOD 1961-76

(annual percentage increase)

<u>PRODUCT TYPE</u>	<u>SPECIES</u>				
	<u>Sockeye</u>	<u>Pink</u>	<u>Chum</u>	<u>Coho</u>	<u>Chinook</u>
Canned	0.8	2.0	2.6	1.8	0.4
Fresh	3.4	3.9	6.2	4.1	4.5
Frozen	3.5	2.7	4.0	3.3	3.7

*Marketed prices of British Columbia salmon processors deflated by the general wholesale price index (1976 prices based on preliminary data).

Source: G. Alex Fraser, "Salmon, Development Prospects to 1985," Unpublished Report, Fisheries and Oceans Canada, Vancouver Nov., 1978.

In recent years, approximately 56 percent of the Canadian Pacific salmon production has been exported. Although all products are consumed in both export and domestic markets, a larger proportion of the fresh/frozen production is exported than is canned production (73 percent versus 47 percent between 1966 and 1974). Therefore there is present a trend toward more sales on export markets, where there is more competition from the other world producing countries. The recent drop in Japanese salmon landings after extended fishing jurisdictions, has caused a sharp increase in export sales of frozen dressed salmon, especially sockeye (see section C-IV-2) to this country.

A-III Extended Jurisdiction

The extended jurisdiction of many fishing countries has not affected the fishing of salmon as greatly as other fish because salmon have customarily been fished in estuaries and close to shore during their return from the ocean to spawn in fresh water. Extended fishing zones did have an effect in the North Pacific however on the Japanese high seas salmon fishery. This fishery, prior to 1977, harvested salmon on the high seas bound for North American and Russian waters. The initial effect on the Japanese fishery occurred in 1977 when they were excluded from the waters of Russia's extended zone, while the subsequent effect was that their allowable catch in waters bordering the Soviet 200-mile boundary was reduced. Japan's salmon catch in 1977 on the open seas dropped to 60 thousand tonnes, down 25 percent from the 1975 bumper year. The Soviet Union's catch, on the other hand, nearly doubled increasing to 131 thousand tonnes. In the 1978 agreement with the U.S.S.R., Japan was compelled to accept a salmon quota of 42,500 tonnes^{1/}. This agreement was expected to reduce Japan's catch of salmon by 32 percent, and their catch of the highly valued red salmon by double that percentage. The 1979 agreement, signed on April 21, set the overall catch quota at the same amount as the previous year, namely 42,500 tonnes. Further restrictions were imposed such as curtailing the high seas portion of allowable catches to 23,500 tonnes from the 28,000 tonnes allowed in 1978.

^{1/} Industry sources state that actual offshore catches are higher than quotas allocated by the U.S.S.R. as some salmon destined for North America is taken and not reported.

The high seas catches of chum salmon were limited to 3.8 million fish as compared to 4.3 million in 1978, those of sockeye salmon to 1.1 million fish as compared to 1.6 million in 1978, and those of coho salmon to 1.2 million fish for which there was no catch restriction in 1978. The long term position of the Japanese offshore fishery does not appear encouraging since these salmon originate in Soviet and North American waters.

In addition, the International Convention for the High Seas Fisheries of the North Pacific Ocean (INPFC), in which Canada, Japan and the U.S.A. are signatories, was amended to exclude Japanese high seas salmon fishing east of 175° E. longitude, except for a small area in the northern Bering Sea. This had the effect of pushing the Japanese high seas fishery approximately 600 nautical miles westward, causing less possibility for fishing salmon destined for North America.

Under reciprocal arrangements, Canadian and American fishermen share equally, the Fraser River sockeye and pink catch permitted by the International Pacific Salmon Fisheries Commission (IPSFC). The areas under the jurisdiction of the commission are those between the 48th and 49th parallels including Puget Sound, San Juan - Gulf Islands, and lower Strait of Georgia.

The market opportunities for salmon arising from extended jurisdiction, therefore, are mainly the result of the Japanese becoming major importers of salmon rather than major exporters. Other effects on salmon markets (caused by extended jurisdiction) are the possible creation of substitution effects i.e., as prices of canned salmon increase consumers may substitute lower priced products, or with more salmon supplies U.S.S.R. canned salmon may be substituted for that not now available from Japan.

A-IV Salmon Enhancement

Each of the major producing countries of salmon is presently engaged in salmon enhancement programs with plans to significantly increase present landings.

The Canadian program for Pacific salmon calls for a doubling of present production of salmon over a thirty year period. During Phase I of the program (to 1983/84) a total of \$157 million will be invested in the construction and operation of enhancement facilities to increase the supply of salmonids to 90 thousand tonnes from the present 75 thousand tonne level. About 85 percent of these funds are allocated to projects which will primarily benefit the commercial and recreational fishing sectors, while the remaining 15 percent will be directed towards projects aimed at increasing employment, regional development and native well-being^{2/}. The long term objective is to increase each of the five species of salmon to its maximum potential through enhancement techniques such as lake fertilizations, transplants, fishways, hatcheries, and spawning channels.

Feasibility studies are currently underway to determine the potential of developing a comparable salmon enhancement program in Atlantic Canada.

In Japan, salmon enhancement projects date back 100 years. Most of this culture is on Hakkaido Island with some on northern Honshu Island. Chum salmon is the main species enhanced although pink and cherry culture is important. The Japanese have recently increased their chum salmon production greatly by upgrading the hatchery system and introducing more innovative techniques.

"The Japanese increased their returns of 9.5 million chums in 1974 to 17 million in 1975. The 1975 returns are equivalent to the entire Japanese high seas salmon catch of 45,000 metric tons. They expect to increase fry output for chum salmon to 2 billion in the next 5 years (1981) with predicted returns of about 25 million adults."^{1/}

The potential for enhancing sockeye and coho runs in Japan has not been encouraging from efforts directed to that end so far.

^{1/} Groot, G. "An overview of Salmonoid Enhancement Programs in countries bordering the North Pacific Ocean" from conference proceedings, journals, annual and newspaper reports, Pacific Biological Station, Department of Fisheries and Oceans Canada, Aug. 1976, Page 10.

^{2/} Phase II of the program commencing in 1985 is presently in the planning stages and will depend on the success of Phase I.

Japan also has a cooperative program with the U.S.S.R. to rear chum and pink salmon following successful Japanese techniques. They are also financing Soviet investments made for the conservation of salmon resources in the form of fees to fish salmon in waters bordering the Soviet 200-mile boundary in the Northwest Pacific.

The U.S.S.R. has a substantial hatchery propagation program for pink and chum salmon. This program was started in the 1960's to offset the gradual devastation of natural runs by heavy ocean fisheries. Projections on the future production are not available.

Some potential for salmon enhancement is also apparent in Korea and China, although actual projections are not available on future production.

The major source of enhanced production in the United States will be from Alaska where a \$500 million program has commenced, aimed at quadrupling the commercial salmon harvest during the next 15 years. The objective is to expand production to historic high levels of 100 million fish by 1990. This program will involve government built hatcheries, and upgrading management and the fish habitat. The non-profit hatchery funding is directed towards fishermen and native organizations thus avoiding the prospects of big business entering.

Washington State's enhancement program consists of hatcheries, spawning and rearing channels, holding ponds and pen-rearing. This program has been well underway for a number of years and is contributing significantly to the fishery. Recently there has been a step up in the program for producing chums, pinks and coho in Puget Sound. Plans are for producing one million chum salmon by 1991 through restoration of wild runs, five million chum per year by 1984 from hatcheries, one half million hatchery coho per year by 1984 and one million pink salmon by 1983 using semi-artificial production and stream rehabilitation. In addition to these state programs, several hatcheries are operated by the Federal administration and are contributing to the fishery.

In Oregon State, an enhancement program was initiated in 1968 designed to attain populations of coho, chinook and steelhead in a major river system. Full development is expected to result in an annual yield of 640 thousand chinook and over 10 thousand steelhead. In this state, private interests have been allowed to build and operate hatcheries. The future production from these hatcheries is uncertain.

Salmon ranching is currently being allowed in Oregon, California and Alaska (under "non-profit" conditions). It is not permitted in Canada or Washington state. This involves rearing salmon to the smolt stage under artificial (man-made) conditions and releasing them to the sea. They are harvested for commercial use when they return to their birth place. These operations have so far been unsuccessful in attaining a significant production but there is potential for successful production. Problems are presented for management due to the complexities that result from mixing natural, enhanced and ocean farmed stocks and the demands for protection of private stocks.

The rearing of Pacific salmon in ocean pens in Canada and Washington State has been allowed under special permit for a few years, but these operations have not yet resulted in large scale production. Most of these have been producing "pan size" salmon for the North American supermarket and restaurant trade.

In Europe, there is a growing production of farmed salmon primarily in Norway. This salmon is raised in ocean fjords and sea pens. Theoretically the potential for this salmon is very good, however some problems have been encountered in rearing.

According to the Norwegian Fish Rearers Association production increased from .9 thousand tonnes in 1975 to 3.3 thousand tonnes in 1978. [Exports of salmon from Norway (including wild salmon) increased from 1.5 thousand tonnes in 1975 to 3.5 thousand tonnes in 1978].

In addition to salmon, there is a farmed production of rainbow trout sometimes referred to as fjord salmon. This production increased from 1.7 thousand tonnes in 1975 to 2.2 thousand tonnes in 1978. This fish is mainly sold domestically (in Norway) but competes with salmon sales. Of the total salmon exports from Norway in 1978, 2.3 thousand tonnes were fresh while 1.2 thousand tonnes were frozen. This is significant in that Europeans generally prefer fresh salmon to frozen, a factor which gives Norwegian product a marketing edge over Pacific salmon. Germany, France, Denmark and Sweden were the most important markets for Norwegian salmon in 1978. The outlook for salmon production from Norway is for a slow but steady increase up to 1982, but perhaps a sharper increase after that time. However, the actual increase will depend on price which, in turn, is affected by world salmon supply. Production costs are high for Norwegian salmon as they are required to be fed with lower valued species such as capelin. (Salmon prices to Norwegian farmers are currently about \$8.00 per pound.)

Scotland in 1978 had a production of reared salmon of from .5 to .6 thousand tonnes. An increase is also projected from this country.

The effect on total world salmon supply resulting from all the above enhancement programs is very precarious to predict. The actual success that each country will experience in attaining its production goals is a major variable. Further uncertainties are associated with declines in natural (non-enhanced) production because of continuing encroachment by alternative uses of estuaries (such as power), urbanization and industrialization. It is safe to conclude, however, that the decline in world salmon production has been halted and an increasing trend has been established. It has been predicted that non-Canadian salmon output could increase as much as 2.0 percent annually in future years so that by 1985 world production could be fourteen percent higher.^{1/}

^{1/}R.W. Morley, and M. Shaffer, "Existing and Potential Demand for Commercial Salmon Production", Department of Fisheries and Oceans Canada, 1977, Page 9, Unpublished report.

B. Global Import Potential

B-I Atlantic Salmon

Due to the very restricted supplies of Atlantic salmon available in Canada, no substantial change is predicted in marketing patterns prior to 1985. Over a longer time period, if supplies increase appreciably through enhancement, there is a good potential to increase exports to United States and European markets because of the very high prices, high demand levels and consumer preference for this salmon.

B-II Pacific Salmon

To determine the global import potential for Pacific salmon, it is necessary to project trends in exports to the major markets and consumption in the domestic market, based on factors influencing demand in those markets. Factors which have been shown to influence salmon demand are population growth, standards of living, and prices of salmon relative to prices of substitutes.

Populations in the market area are projected to increase to 739 million by 1985 (.767 percent per year). The fastest growing markets, in terms of population size are the most important for Canadian salmon. These include Canada, Australia and New Zealand, Japan, United States and France (Table 5).

Standards of living, as measured by per capita disposable incomes are highest in Switzerland, Sweden, Canada, U.S.A. and Denmark. Projections, based on the average annual increase from 1970 to 1976 would change this ordering by 1985 to Switzerland, Australia, Norway, Sweden and Denmark (Table 5).

TABLE 5 - POPULATION AND PER CAPITA DISPOSABLE INCOMES IN THE MAIN MARKETS
FOR CANADIAN PACIFIC SALMON WITH PROJECTIONS TO 1985

	Annual Percentage		Base Year		Projections			
	Increase		1977	1976	1981		1985	
	%	%	Pop (Mils)	Income (US \$)	Pop (Mils)	Income (US \$)	Pop (Mils)	Income (US \$)
<u>North America</u>								
Canada	1.7	19.7	23.3	7,339	24.2	14,568	26.5	20,341
U.S.A.	0.9	10.6	216.8	6,974	222.2	10,670	232.2	13,627
<u>Western Europe (E.E.C.)</u>								
United Kingdom	0.0	12.2	56.0	3,479	56.0	5,601	56.0	7,299
Denmark	0.2	22.8	5.2	6,821	5.1*	14,597	5.3	20,818
France	0.9	22.4	53.1	5,805	55.1*	12,307	57.1	17,508
W. Germany	0.03	22.4	61.4	6,330	62.0*	13,420	62.9	19,091
Italy	0.6	11.9	56.0	2,730	57.5	4,354	58.7	5,654
Netherlands	0.5	27.2	13.9	5,859	14.2	13,827	14.5	20,202
Belgium/Luxembourg	0.4	26.8	10.3	6,279	10.4	14,692	10.6	21,424
<u>Western Europe (non-E.E.C.)</u>								
Finland	0.0	27.9	4.7	5,334	4.7	12,775	4.7	18,728
Norway	0.6	27.2	4.0	6,462	4.1*	15,250	4.2	22,281
Sweden	0.7	19.1	8.3	7,963	8.6*	15,668	8.8	21,651
Switzerland	0.01	28.4	6.3	8,164	6.7*	19,757	6.9	29,031
Greece	0.3	18.8	9.0	2,405	9.1*	4,666	9.2	6,474
Spain	0.9	28.2	36.4	2,689	37.2*	6,481	39.1	9,514
<u>Pacific</u>								
Australia	2.1	25.9	14.1	6,809	15.1*	15,626	16.5	22,680
New Zealand	1.6	14.4	3.1	3,788	3.3*	6,515	3.5	8,697
Japan	0.9	28.8	114.2	4,475	117.5*	10,919	122.4	16,074
TOTAL	0.8	21.9	696.1		713.0		739.1	

*Projection Figures for 1980.

Sources: Canadian Department of Industry, Trade and Commerce.
United Nations World Population Prospects.
United Nations Yearbook of National Account Statistics, 1977.

Certainly a factor in the increase in demand for salmon in the major markets has been the devaluation of the Canadian dollar vis-à-vis the currency in the main importing countries. Since 1976, the Canadian dollar has dropped 15 percent in terms of U.S. currency, 28 percent in terms of French francs, 38 percent in terms of the U.K. pound sterling and 59 percent in terms of the Japanese yen (Table 6). An upward movement in the dollar value relative to other major currencies could seriously hamper export sales.

TABLE 6 - EXCHANGE RATES FOR THE FOUR MAIN SALMON IMPORTING COUNTRIES

	<u>France</u> (Franc)	<u>Japan</u> (Yen)	<u>U.K.</u> (Pound)	<u>U.S.</u> (Dollar)
1968	21.176	.29887	257.92	107.757
1969	20.787	.30050	257.40	107.695
1970	18.880	.29144	250.09	104.382
1971	18.327	.29084	246.84	100.987
1972	19.640	.32689	247.76	99.072
1973	22.541	.36923	245.16	100.023
1974	20.345	.33544	228.86	97.790
1975	23.758	.34288	226.00	101.729
1976	20.651	.33272	177.97	98.610
1977	21.617	.39678	185.41	106.256
1978	25.326	.54692	218.67	113.987
1979 (June)	26.535	.53198	246.40	117.151

1. In Canadian cents per unit of foreign currency.
2. Source - 1968-1978 United States Federal Reserve Bulletin.
- 1979 June 13, 1979 Wall Street Journal.

A recent study undertaken by the Canadian Salmon Enhancement Directorate has investigated demand considering not only population growth, but also incomes and substitute prices. This demand analysis had forecasted real price changes for Canadian Pacific salmon products with a salmon enhancement program and without a program. The results show price increases under both conditions for canned, fresh and frozen salmon indicating that projected demand in the major markets will expand at a more rapid rate than world supply^{1/}.

World exports of frozen salmon have shown an increasing trend from less than 14 thousand tonnes in the late 1960's to over 30 thousand tonnes in the mid 1970's. This trade advanced sharply upward in 1977 and 1978 when Japan commenced importing large quantities of salmon. No exports of frozen salmon have been recorded in past years from the U.S.S.R. (Table 7).

TABLE 7 - WORLD EXPORTS OF FROZEN SALMON
BY EXPORTING COUNTRIES 1967 - 1976
(000 Tonnes)

<u>Year</u>	<u>Canada</u>	<u>United States</u>	<u>Japan</u>	<u>Total</u>	<u>Net Exports</u> ^{2/}
1967	9.7	7.5	.0	17.2	13.5
1968	10.1	7.0	.0	17.1	13.5
1969	12.9	13.1	.0	26.0	22.3
1970	10.6	12.8	.3	23.7	18.8
1971	13.5	10.2	.4	24.1	19.9
1972	17.6	13.4	*	31.0	26.0
1973	21.1	25.3	.2	46.6	40.1
1974	14.2	11.8	.1	26.1	20.5
1975	14.1	20.7	1.4	36.2	30.9
1976	12.4	17.4	2.3	32.1	26.5

Source: FAO, Yearbook of Fishery Statics - Fishery Commodities
Rome, Italy, 1967-1976.

* less than 50 tonnes

^{1/} D.J. Devoretz, "Demand for Salmon Products" Department of Economics and Commerce, Simon Fraser University, Vancouver, Jan. 24, 1979 (Unpublished).

^{2/} Exports between producing countries have been deducted from total.

The main importing countries have been traditionally France, the U.K., Sweden and Japan (Table 8). Denmark, West Germany, United States and Italy have also been significant importers of frozen salmon.

TABLE 8 - WORLD IMPORTS OF FROZEN PACIFIC SALMON
BY IMPORTING COUNTRIES, 1967 - 1978, (Net Imports)
(000 Tonnes)

<u>YEAR</u>	<u>JAPAN</u>	<u>FRANCE</u>	<u>U. K.</u>	<u>SWEDEN</u>	<u>OTHER</u>	<u>TOTAL</u>
1967	1.0	5.1	4.4	0.7	2.6	13.8
1968	1.6	4.5	4.0	1.4	2.0	13.5
1969	7.6	5.1	4.0	2.2	3.4	22.3
1970	3.4	5.6	3.4	2.5	3.9	18.8
1971	2.3	6.4	3.4	2.9	4.9	19.9
1972	1.7	9.4	4.6	4.5	5.8	26.0
1973	16.1	8.0	4.6	3.6	7.8	40.1
1974	2.2	6.8	2.6	3.8	5.1	20.5
1975	3.6	12.0	3.4	3.9	8.0	30.9
1976	*	10.2	3.2	3.3	9.8	26.5
1977	19.3	12.1				
1978	49.7					

Sources: 1. F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976

2. Canadian Department of Industry Trade and Commerce

*Net imports have been derived by subtracting each countries total frozen exports from its frozen imports.

Historically, canned salmon has been exported by each of the major producing countries. In the decade from 1967 to 1976, Japan accounted for 48 percent of these exports followed by Canada at 27 percent, United States at 16 percent and Russia at 9 percent.

Total world exports of canned Pacific salmon are showing a slightly declining trend since 1968 when the total quantity exported attained a ten year high of 63.4 thousand tonnes. The 1976 trade statistics show total exports at 40.2 thousand tonnes (Table 9).

TABLE 9 - WORLD EXPORTS OF CANNED PACIFIC SALMON
BY EXPORTING COUNTRIES

<u>YEAR</u>	<u>CANADA</u>		<u>JAPAN</u>		<u>U.S.A.</u>		<u>RUSSIA</u>		<u>TOTAL</u>
	<u>000</u> <u>tonnes</u>	<u>%</u>	<u>000</u> <u>tonnes</u>	<u>%</u>	<u>000</u> <u>tonnes</u>	<u>%</u>	<u>000</u> <u>tonnes</u>	<u>%</u>	<u>000</u> <u>tonnes</u>
1967	19.8	33.4	27.5	46.4	9.3	15.7	2.7	4.6	59.3
1968	18.1	28.6	38.1	60.0	2.6	4.1	4.6	7.3	63.4
1969	15.9	32.5	22.3	45.6	7.0	14.3	3.7	7.6	43.9
1970	7.0	16.2	24.0	55.4	7.6	17.6	4.7	10.9	43.3
1971	10.9	20.8	28.6	54.7	8.3	15.9	4.5	8.6	52.3
1972	13.5	23.4	30.4	52.6	9.7	16.8	4.2	7.3	57.8
1973	17.3	40.0	13.4	31.1	7.7	17.8	4.8	11.1	43.2
1974	12.9	38.7	12.9	38.7	3.8	11.4	3.7	11.1	33.3
1975	7.1	18.0	17.7	44.8	10.2	25.8	4.5	11.4	39.5
1976	7.3	18.2	18.5	46.0	8.9	22.1	5.5	13.7	40.2

Source: F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.

Traditionally, the United Kingdom has been the largest import market for canned salmon accounting for 56.3 percent of total world imports in the decade from 1967 to 1976. Other significant import markets have been Australia, Belgium/Luxembourg, the Netherlands, France and Italy, but each of these has accounted for less than 6 thousand tonnes of imports. Imports of salmon to the United Kingdom have displayed a significant declining trend since the late 1960's when over 40 thousand tonnes were recorded. Other importing countries appear to be importing more constant quantities over time (Table 10).

TABLE 10 - WORLD IMPORTS OF CANNED PACIFIC SALMON
BY IMPORTING COUNTRIES

YEAR	UNITED KINGDOM		AUSTRALIA		BELG. & LUXEM.		NETHERLANDS		FR.	IT.	NEW ZEAL.		U.S.	OTHER		TOTAL
	000 tonnes	%	000 tonnes	%	000 tonnes	%	000 tonnes	%			000 tonnes	%		000 tonnes	%	
1967	40.1	67.6	4.7	7.9	3.3	5.6	2.7	4.6	1.2	.7	.7	.2	.3	5.7	9.6	59.3
1968	43.4	68.4	4.2	6.6	2.5	3.9	2.4	3.8	1.7	.4	.7	2.4	3.8	5.7	9.0	63.4
1969	29.2	59.7	4.9	10.0	3.2	6.5	2.4	4.9	1.2	.3	.7	1.3	2.7	5.7	11.7	48.9
1970	25.4	58.7	2.9	6.7	1.8	4.2	2.6	6.0	1.0	.5	1.2	---	---	7.9	18.2	43.3
1971	30.1	57.6	5.1	9.8	3.3	6.3	2.8	5.4	2.0	.4	.9	1.0	1.9	6.7	12.8	52.3
1972	30.6	52.9	5.7	9.9	2.8	4.8	3.0	5.2	2.8	.3	.9	5.7	9.9	6.0	10.4	57.8
1973	24.1	55.8	3.7	8.6	2.9	6.7	1.5	3.5	1.5	.3	1.5	1.7	3.9	6.0	13.9	43.2
1974	14.9	44.7	4.1	12.3	2.2	6.6	1.4	4.2	.7	.2	.6	3.3	9.9	5.9	17.7	33.3
1975	20.7	52.4	2.5	6.3	2.8	7.1	2.8	7.1	.9	--	.5	1.3	3.3	8.0	20.3	39.5
1976	18.2	45.2	5.7	14.2	3.6	9.0	3.5	8.7	1.5	--	.8	.6	1.5	6.3	15.7	40.2

Source: F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976

C. Future Potential for Canadian Salmon

C-I Western Hemisphere

The primary western markets for Pacific salmon are in Canada and United States (discussed below). Other markets which have demonstrated some opportunities for sales of salmon products are Argentina, Chile, Columbia, Mexico, Paraguay and Venezuela. In these countries, standards of living are such that higher priced products such as canned, frozen and smoked salmon are in demand. Past exports to these countries have been small but there is a good potential for increasing sales.

C-I-1 The Domestic Market

Historically, Canada has been a very large market for salmon, especially canned salmon but also for frozen salmon in some years. In the decade from 1968 to 1977, domestic consumption of canned salmon ranged from a low of 12.2 thousand tonnes to a high of 17.6 thousand tonnes with an annual average of 17.0 thousand tonnes. Exports ranged from 5.7 thousand tonnes to 17.4 thousand tonnes, leaving about 56 percent of the annual production (plus imports) for domestic consumption. Canned salmon exports and production have declined in the 1970's, while canned imports, primarily from the United States have increased slightly. Per capita consumption (at .73 kg in 1978) is at near the same level as it was a decade ago but less than in the early 1970's (Table 11).

TABLE 11
DOMESTIC DISAPPEARANCE OF PACIFIC CANNED SALMON (1968-1978)

	<u>PRODUCTION</u>	<u>EXPORTS</u>	<u>IMPORTS</u>	<u>CONSUMPTION</u>	<u>PER CAPITA</u>
		(Tonnes)			(kg)
1968	38,036.6	18,120.9	0	15,792.6	.763
1969	13,589.4	15,970.4	1,419.3	15,094.2	.719
1970	30,991.9	7,018.5	1,730.3	15,173.1	.712
1971	30,568.9	11,002.0	1,476.7	17,635.0	.820
1972	25,533.9	13,486.3	785.6	17,869.4	.820
1973	33,750.1	17,399.5	248.9	16,248.8	.739
1974	31,110.5	12,884.5	98.8	15,404.0	.680
1975	11,264.5	5,736.7	1,714.0	15,849.0	.690
1976	22,335.1	7,346.1	1,989.5	12,203.8	.531
1977	29,200.0	8,287.1	2,650.9	17,389.2	.750
1978	24,535.0	11,415.9	2,830.2	17,147.1	.730

Source: Calculated from statistics published by the Economics and Statistics Section, Fisheries and Oceans Canada, Vancouver, and the Fisheries Association of British Columbia.

There is no evidence of any trend of decrease or increase in either canned sockeye or pink consumption, but there is some indication of declines in canned coho and chum consumption.

For frozen salmon, domestic consumption has remained at less than 4 thousand tonnes in the past decade. A slightly increasing trend is noted since 1976 in per capita and total consumption. Both imports and exports are also showing signs of increasing (Table 12). In the past decade, domestic frozen salmon consumption consisted of 25 percent coho, 26 percent chinook 13 percent pink, and 36 percent chum salmon.

The trends which are evident in the United States are also known to be true in the domestic market. More frozen salmon is being sold in the higher priced restaurant trade, and more is going into smoked and luxury products. Home cooking is declining causing a corresponding reduction in frozen salmon sales to the housewife. Market development and promotion activities are taking place but additional educational programs coupled with market research could have positive results in increasing consumption.

TABLE 12 - DOMESTIC DISAPPEARANCE
OF PACIFIC FROZEN SALMON, 1968-1978

	<u>PRODUCTION</u>	<u>EXPORTS</u>	<u>IMPORTS</u> (Tonnes)	<u>CONSUMPTION</u>	<u>PER CAPITA</u> (kg)
1968	16,014	10,143	643	2,951	.14
1969	11,616	12,923	870	1,983	.09
1970	17,218	10,557	1,358	3,966	.19
1971	11,827	13,456	1,630	2,822	.13
1972	21,792	17,589	1,242	1,283	.06
1973	22,366	21,127	1,572	2,487	.11
1974	8,420	14,201	2,211	N.A.	-
1975	8,737	14,119	1,454	N.A.	-
1976	14,583	12,380	1,505	3,102	.13
1977	16,640	15,843	3,578	5,588	.24
1978	23,498	22,952	3,650	2,710	.11

Source: Calculated from statistics published by the Economics and Statistics Section, Fisheries and Oceans Canada, Vancouver.

The projection for the domestic market is that by 1985 canned consumption will be 18.0 thousand tonnes, consisting of 6.3 thousand tonnes sockeye, 6.8 thousand tonnes pink, 4.7 thousand tonnes other canned products. This is based on the existing per capita consumption rates. For fresh and frozen salmon, a slight increase in per capita consumption is projected to result in a total consumption by 1985 of 12.3 thousand tonnes.

C-I-2 The United States Market

United States has traditionally been a significant market for fresh, frozen and canned salmon from Canada, in addition to being a large exporter of salmon products to Canada. Per capita consumption of salmon (canned and frozen) has experienced a long term decline due to declining total supply, increasing exports and increasing population. Throughout the 1960's and 1970's the U.S. resident population rose at an average rate of 1.09 percent per year. "The percentage of the total weight available for consumption, that actually was consumed in the U.S., has declined steadily from 82 percent in 1960 to 35 percent in 1977 reflecting the growing importance of the U.S. in the export market."^{1/} With the increase in exports, a further trend evident is the utilization of those species traditionally canned (sockeye, pink and chum salmon) in fresh and frozen markets.

There appears to exist a strong substitutional relationship in the market between the demand for canned salmon and that for canned tuna. It is known that promotion policies of the large fish dealers had a large effect on increasing tuna demand. This has not been as prevalent for salmon as the needs to influence domestic demand have not been as great. The potential to increase salmon demand in the United States is apparent due to the large population and high living standards. At the same time it is evident that home cooking is declining with restaurant eating becoming more frequent. The most rapid growth in the restaurant field has been in the fast food service which does not normally serve salmon but uses lower priced fish. The higher priced restaurant trade which uses large amounts of salmon is growing but at a slower pace.

The actual opportunities which arise in the United States market for Canadian salmon will depend on United States production and availability. The actual imports of salmon products to the United States (mostly from Canada) have varied according to domestic catches and inventories with no trends evident except for cured imports

^{1/} See J.R. Wilson. "Market Structure of the Alaska Seafood Processing Industry", University of Alaska 1979, unpublished report.

TABLE 13 - CONSUMPTION OF SALMON PRODUCTS IN THE UNITED STATES

YEAR	Landings ¹ Dressed Weight Lbs. (x 1000)	First of Year Canned Pack Inventory Lbs. (x 1000)	First of Year ² Frozen Inventory Lbs. (x 1000)	First of Year ³ Cured Inventory Lbs. (x 1000)	Canned ⁴ Imports Lbs. (x 1000)	Fresh ⁵ Frozen Imports Lbs. (x 1000)	Cured ⁶ Imports Lbs. (x 1000)	Total Available For Consumption Lbs. (x 1000)
1968	229,326	100,176	10,412	1,604	4,955	9,811	154	356,438
1969	187,479	131,808	17,320	1,562	2,217	8,425	138	348,949
1970	287,083	103,824	9,777	1,430	2,441	7,448	120	412,123
1971	232,620	127,200	23,682	2,191	1,551	7,684	167	395,095
1972	162,287	129,552	19,457	2,050	11,647	18,696	82	343,771
1973	155,152	72,384	21,120	891	7,859	18,237	107	275,750
1974	137,774	45,168	27,812	967	8,553	12,483	187	232,944
1975	141,113	80,064	24,092	1,216	3,265	9,250	197	259,197
1976	216,469	64,992	17,403	853	2,521	7,742	204	310,184
1977	234,949	98,016	24,756	568	586	5,708	359	364,942

YEAR	Ending Inventory of Canned Pack Lbs. (x 1000)	Ending ² Inventory of Frozen Goods Lbs. (x 1000)	Ending ³ Inventory of Cured Goods Lbs. (x 1000)	Canned Exports Lbs. (x 1000)	Fresh/ Frozen Exports Lbs. (x 1000)	Apparent Consumption Lbs. (x 1000)	Total U.S. ⁷ Resident Population Numbers (x 1000)	Per Capita Apparent Consumption Lbs
1968	131,808	17,320	1,562	15,552	16,234	173,962	199,399	.8724
1969	103,824	9,777	1,430	5,712	30,553	203,107	201,385	1.0086
1970	127,200	23,682	2,191	20,544	28,201	210,305	203,810	1.0319
1971	129,552	19,457	2,050	20,496	32,891	190,649	206,219	.9245
1972	72,384	21,120	891	24,912	34,685	189,779	208,234	.9114
1973	45,168	27,812	967	20,928	60,743	120,132	209,859	.5724
1974	80,064	24,092	1,216	10,224	28,067	89,281	211,389	.4224
1975	64,992	17,403	853	8,976	48,229	118,744	213,051	.5574
1976	98,016	24,756	568	7,200	41,922	137,722	214,669	.6416
1977	124,128	29,165	1,084	11,904	69,844	128,817	216,332	.5955

1 Round weight converted to dressed weight by a factor of .70.

2 Imported fillets, steaks, round and dressed.

3 Includes only mild cured salmon.

4 48 lbs./standard case; includes salmon packed in oil.

5 Includes fresh and chilled salmon in fillet, steak and round/dressed form.

6 Includes dry and brine salted, smoked, kippered.

7 Population estimates as of July 1, excluding armed forces overseas.

Source: Fishery Statistics of the U.S.; Current Fisheries Statistics; Bureau of Census.

which are experiencing a slow-growth (Table 14). However, the proximity of the market, the close trading ties and seasonal supply fluctuations are bound to signify continuing potential for exporting to this market.

Projections for the market are for fresh exports to increase slightly to 1.3 thousand tonnes, frozen to remain at the 2.0 thousand tonne level, canned to attain a level of 430 tonnes.

C-II Western Europe (E.E.C.)

Western European countries of the E.E.C. are significant importers of Canadian Pacific salmon. For canned salmon, the main markets are the United Kingdom, Belgium/Luxembourg, the Netherlands and Italy, while for frozen salmon the major markets are France, Germany, Denmark, Italy, the Netherlands and Belgium/Luxembourg.

C-II-1 United Kingdom

The United Kingdom has traditionally been a large market for canned red and medium red salmon. Of the canned salmon imported into the U.K. from Canada in recent years, sockeye has amounted to about 60 percent, pink 35 percent and coho 5 percent. Red salmon has traditionally been served straight out of the tin, while pink is served in sauces or other preparations

The United Kingdom presents a potential for increasing imports of canned salmon from Canada. This is apparent because of the traditionally large consumption which has dropped temporarily in recent years, and due to the increasing living standards and economic conditions since developing oil resources. Prices for canned salmon in 1979 have increased by 25 percent. Potential is apparent for lower priced canned salmon along with the more popular sockeye products. Since 1977, Japan has not supplied any canned salmon to the U.K. leaving a large gap in the market. Prior to 1977, Japan was the largest supplier to the market. It has been suggested that a brand identification of B.C. salmon such as a dogwood emblem would provide a good impetus to sales, but this may not be practical until production increases.

TABLE 14 - IMPORTS OF CANNED SALMON TO UNITED KINGDOM
BY COUNTRY OF ORIGIN

(000 Tonnes)

Year	CANADA		JAPAN		U.S.A.		USSR		Total MT
	MT	%	MT	%	MT	%	MT	%	
1967	10.6	26.4	20.9	52.1	7.4	18.5	1.2	3.0	40.1
1968	9.7	22.4	29.3	67.5	1.5	3.5	2.9	6.6	43.4
1969	10.5	36.0	12.6	43.2	3.7	12.7	2.4	8.2	29.2
1970	2.8	11.0	16.3	64.2	3.8	15.0	2.5	9.8	25.4
1971	5.8	19.3	17.3	57.5	4.7	15.6	2.3	7.6	30.1
1972	7.1	23.2	15.0	49.0	7.2	23.5	1.3	4.2	30.6
1973	9.8	40.7	7.2	29.9	6.1	25.3	1.0	4.1	24.1
1974	5.5	36.9	6.3	42.3	2.4	16.1	.7	4.7	14.9
1975	3.7	17.9	9.3	44.9	6.3	30.4	1.4	6.8	20.7
1976	3.9	21.4	8.5	46.7	4.2	23.1	1.6	8.8	18.2
1977	5.3								
1978	4.7								

Sources: 1. F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.
2. Canadian Department of Industry Trade and Commerce.

The U.K. has also been a steady importer of frozen salmon with total imports averaging 3.8 thousand tonnes from 1967 to 1976 (Table 8). Canadian exports amounted to 748 tonnes in 1976, increasing to 902 tonnes by 1978. Over 50 percent of these exports were chum salmon to be used for further processing into smoked products in the U.K.

Quality must be maintained for the smoking industry. There is a large demand for smoked salmon and an increase is possible in future. It is sold nationally to caterers and retailers but is also exported. In 1977, 234 tonnes of smoked salmon were exported from the United Kingdom. The export trade is increasing due to wide promotion and participation in trade shows. Major markets for smoked salmon exports from the U.K. are the Far East, Middle East, Europe, South Africa, Australia and the United States.

Even though frozen salmon enjoys duty free entry into the U.K., the price is considered too high. Pacific salmon prices are lower than those of Atlantic salmon from Canada's east coast. Traditionally Canadian salmon is considered to be of better quality than other salmon.

The projection of the quantity of canned and frozen salmon which will be sold on the U.K. market by 1985 is 10 thousand tonnes for canned and .975 thousand tonnes for frozen salmon. This is thought to be a reasonable projection in view of the absence of competition from Japan. However, the United States and the U.S.S.R. may increase exports to the U.K. because of more raw fish supplies which were previously fished by Japan.

C-II-2 France

France has historically been the largest export market for frozen salmon prior to 1978 when Japan commenced importing larger quantities. The market has been mainly for coho (75 percent), but also for chinook and recently Atlantic salmon. Frozen salmon imports increased sharply from 1974 to 1975 and have remained at over 12 thousand tonnes to 1977. In 1977 Canada supplied 4.7 thousand tonnes (39 percent) of the total.

With no indigenous production, France relies generally on imports from the U.S.A. and Canada for its smoking trade and on the U.K., Ireland and Norway for its fresh trade. Norway is, however, seen as a major supplier to the smoking trade in the medium to long term with farmed salmon. Comparative prices of salmon products in France (Min Rungis near Paris) in March 1979 were as follows:

		<u>Price (in French Francs per kg)</u>		
	<u>Product</u>	<u>Low</u>	<u>High</u>	<u>Avg.</u>
Salmon (Norway)	R-Salt-Sm	120	133	131
Salmon (Canada)	G-Salt-Sm	80	88	84
Salmon (Denmark)	R-Salt-Sm	120	125	124
Sides (Norway)	SL-Recons	110	130	120
Sides (Canada)	SL-Recons	70	90	80
Sides (Denmark)	SL-Recons	110	130	120
Salmon (Scotch Farm)	R	47	49	48
Salmon (Scotch Wild)	R	60	75	68
Salmon (Norwegian)	R	30	38	25

R = Round

G = Gutted

SL = Sliced and Reconstituted

The canned salmon market in France increased substantially in volume between 1976 and 1977 with the U.S.S.R. dropping from its dominant position as supplier of 82 percent to 68 percent, and Japan from 12 percent to six percent. Canada increased its share from five percent to 18 percent. Years ago it is reported that Canada was the main supplier of canned salmon to France. This situation changed when the U.S.S.R. and Japan came in with a more constant supply of product. With lower supplies available from Japan, Canada is again increasing her share of the market although sales were affected by the 1978 botulism scare in France as well.

Canned salmon imports to France totalled 3.6 thousand tonnes in 1977, compared to an average of 1.4 thousand tonnes in the previous ten years (Table 15).

TABLE 15 - IMPORTS OF CANNED SALMON TO FRANCE
BY COUNTRY OF ORIGIN

(000 Tonnes)

<u>YEAR</u>	<u>CANADA</u> <u>000 TONNES</u>	<u>JAPAN</u> <u>000 TONNES</u>	<u>USSR</u> <u>000 TONNES</u>	<u>TOTAL</u> <u>000 TONNES</u>
1967	.7	.5	---	1.2
1968	.3	1.4	---	1.7
1969	.2	1.0	---	1.2
1970	.1	.9	---	1.0
1971	.1	1.3	.6	2.0
1972	.3	1.7	.8	2.8
1973	*	.3	1.2	1.5
1974	.3	.3	.1	.7
1975	.3	.5	.1	.9
1976	---	.2	1.3	1.5
1977				
1978				3.6

- Sources: 1. F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.
2. Canadian Department of Industry Trade and Commerce.

There are few import restrictions for trade with France. However, internal regulations such as price ceilings at the wholesale and retail levels have affected the salmon trade with France in the past. In France, high prices are not a deterrent to "eating out", so that restaurant consumption of salmon is large. It is felt that the demand for higher priced luxury products will increase in the future.

With the trend towards fewer middlemen, product can be imported by a supermarket chain, or on their behalf by a central buying unit, for direct sale to consumers. Wholesale fish mongers and agents/representatives number in the thousands, many operating from limited facilities.

The projection for the French market to 1985 for exports from Canada is 5.6 thousand tonnes for frozen salmon and 300 tonnes for canned salmon.

C-II-3 Denmark

There is an increasing market in Denmark for frozen salmon. In 1977 exports from Canada were over one thousand tonnes, up 33 percent from the previous year. In 1978 these exports jumped to over 1.2 thousand tonnes. Seventy-nine percent of the 1978 exports to Denmark were frozen chum salmon while most of the balance was sockeye and pinks. It is reported that the Danish market prefers Atlantic salmon but Canadian and American Pacific salmon represent 80 percent of all salmon consumed. Atlantic salmon in Denmark, as in other European countries, is more expensive than Pacific salmon.

Small quantities of canned salmon exports are also recorded from Canada to Denmark (35 tonnes in 1977).

It is thought that the Danish market will absorb 12.6 thousand tonnes of Canadian frozen salmon and 92 tonnes of Canadian canned salmon by 1985.

C-II-4 West Germany

Exports of Canadian frozen salmon to West Germany have been close to the one thousand tonne level in the past three years. Chum salmon has been the most important item (61 percent in 1978) followed by spring and coho. West Germany imports an average of 4.0 thousand to 4.5 thousand tonnes of salmon in total per year. Her landings are negligible. On the average, the United States has supplied 30 percent, Norway 17 percent and Denmark 6 percent.

The bulk of the imports are further processed into high-value smoked salmon, consumption of which is expected to grow by 10% annually over the next 5-6 years. Species and sizes used in the smokeries are in order of preference:

Troll salmon:	Pounds:
Red King	7/11
Red King	11/18
Silver	6/9
Silver	9+
Summer Chums	

Net Salmon:

King

A threat to Canadian imports may be posed by further development of Norwegian aquaculture salmon. At present, Canadian salmon prices are still competitive with Norwegian prices (1 kg with head, gutted at 50 Nkr - C\$11.20), but the German importer expects a substantial drop in prices in about two years, when certain bottlenecks in aquaculture technology have been overcome. At that time, a Norwegian production of 4-5,000 tonnes at a substantial price decrease is thought possible.

One area in which Canadian exports have been singularly unsuccessful is the attempt to introduce canned salmon as a replacement for canned tuna, (sales for which amount to 12.0 thousand tonnes) into the West German market. The German housewife would require a massive educational campaign before she would accept the Canadian canned salmon product, which includes bones and skin. The industry has often voiced the view that "the German market is a low-price island in the world fish market". It believes that the German housewife has for generations assigned a certain price relationship between fish and competing food products, which she is not willing to change despite the shift in the cost structure of fish (unit cost increasing) when compared to other

agricultural products (cost stable or even decreasing). As a result, price elasticity for all but luxury-type fish products is high, and quantities purchased will drop quickly in response to an even moderate price increase. As proof, the industry points to numerous examples: the necessity to use saithe and hake instead of the generally accepted cod in the processing of sticks and portions; the decline in the sale of saithe after the banning of the German fleet from Icelandic waters; and the decline in the sale of herring products in 1977/78. This leaves unanswered the question to what extent market reactions of the consumer are subject to the manipulation of a highly concentrated industry.

The projection for the West German market is for Canadian exports of 1.2 thousand tonnes for frozen salmon, and 30 tonnes for canned salmon. This projection is perhaps optimistic depending on Norway's future success in their farmed salmon production.

C-II-5 Italy

The Italian market has been a small but continuous consumer of salmon products. From 1976 to 1978, imports of frozen salmon from Canada have averaged 509 tonnes and canned salmon has averaged 245 tonnes. Canada has recently supplied 59 percent of the frozen market and 79 percent of the canned quantities imported. Competition in the frozen trade has traditionally been supplied mainly by United States, and to a lesser extent Japan. Canned imports are recorded from many European countries, Japan and the U.S.S.R.

Chinook and coho salmon have been the main frozen products imported, while pink salmon makes up most of the canned imports from Canada. Smoked salmon imports are also a significant item, primarily from France, the Netherlands, and Denmark. These imports averaged 115 tonnes from 1975 to 1977.

Italy lacks an efficient distribution system for domestic fish. With the present distribution system, which often involves fish products that may change hands several times before reaching the consumer, it is difficult to guarantee adequate health controls. The Italian Ministry of Health recently issued regulations requiring all countries exporting fish and fish products to Italy to specify their agencies qualified to release certificates of health and origin, and to submit full descriptions of health control legislation and procedures governing fish products, as well as a list of the unconditionally edible fish species exported.

The Italian market for salmon seems to be somewhat price inelastic compared to other European countries. This would indicate that sales could be increased only at rather substantial reductions in prices. The projection for exports of Canadian salmon to Italy by 1985 is 525 tonnes for frozen salmon, and 375 tonnes for canned salmon.

C-II-6 The Netherlands

This country has traditionally been a substantial importer of canned salmon. Total imports in the years from 1976 to 1978 averaged 4.3 thousand tonnes, compared to an average of only 2.3 thousand tonnes in the five years previous to 1976. Japan has usually been the largest supplier of canned salmon to this market, followed by the United States. This country re-exports a significant amount of their imports to other E.E.C. countries.

Prior to 1977, Canada had not been a large supplier to the market, but in the last two years Canada's exports increased to 1.1 thousand tonnes or 22 percent of total supplies (Table 16).

TABLE 16 - IMPORTS OF CANNED SALMON TO THE
NETHERLANDS BY COUNTRY OF ORIGIN

<u>YEAR</u>	<u>CANADA</u>		<u>JAPAN</u>		<u>U.S.A.</u>		<u>TOTAL</u>
	<u>000 Tonnes</u>	<u>%</u>	<u>000 Tonnes</u>	<u>%</u>	<u>000 Tonnes</u>	<u>%</u>	<u>000 Tonnes</u>
1967	.7	25.9	1.3	48.1	.7	25.9	2.7
1968	.5	20.8	1.4	58.3	.5	20.8	2.4
1969	.2	8.3	1.4	58.3	.8	33.3	2.4
1970	*	---	1.8	69.2	.8	30.8	2.6
1971	*	---	1.9	67.9	.9	32.1	2.8
1972	*	---	2.4	80.0	.6	20.0	3.0
1973	*	---	1.0	66.7	.5	33.3	1.5
1974	---	---	1.2	85.7	.2	14.3	1.4
1975	.2	7.1	1.8	64.3	.8	28.6	2.8
1976	.1	2.9	2.3	65.7	1.1	31.4	3.5
1977	.9	23.1					3.9
1978	1.1	22.4					4.9

Sources: 1. F.A.O., Yearbook of Fishery Statistics - Fishery
Commodities, Rome, Italy, 1967-1976

2. Canadian Department of Industry Trade and Commerce.

Frozen salmon imports to the Netherlands averaged one thousand tonnes in the past three years. Canada supplied an annual average of 23 percent of this supply.

Competitive prices and quality are reported to be very important in this market. Consumers demonstrate a strong preference for fresh versus frozen fish. Traditional imports of salmon appear to have overcome the quality "barrier" although on some fish, Canada has a poor quality reputation.

It is projected that the Netherlands will import 350 tonnes of frozen and 1700 tonnes of canned salmon from Canada by 1985.

C-II-7 Belgium and Luxembourg

Belgium is also a significant market for canned salmon, with imports averaging 3.9 thousand tonnes in the years 1976 and 1977. There has been a slight increase in canned salmon imports in recent years. Japan was a large supplier to the market prior to 1977, averaging 34 percent of the supplies in the years from 1967 to 1976.

Canada's share of the imports climbed to 54 percent in 1977 from the previous level of 28 percent (Table 17). The main species of canned salmon exported from Canada to this market is pink salmon amounting to 77 percent in 1978.

Frozen salmon imports to this market were close to two thousand tonnes in 1976 and 1977. Canada's exports of this product increased between 1976-1977 to 565 tonnes, but declined in 1978 to 386 tonnes. Most of this quantity was coho salmon but some consists of red chinook, chum and sockeye. Of the fresh and frozen salmon imported, some is used for smoking and curing, most of which is consumed domestically.

The market projections computed for Belgium and Luxembourg imports of frozen Canadian salmon is 469 tonnes, and canned is 2.0 thousand tonnes by 1985.

TABLE 17 - IMPORTS OF CANNED SALMON TO BELGIUM
AND LUXEMBOURG BY COUNTRY OF ORIGIN

YEAR	CANADA		JAPAN		U.S.A.		USSR		000 Tonnes
	000 Tonnes	%	000 Tonnes	%	000 Tonnes	%	000 Tonnes	%	
1967	2.3	69.7	.8	24.2	.2	6.1	--	--	3.3
1968	1.7	68.0	.8	32.0	--	--	--	--	2.5
1969	1.2	37.5	1.5	46.9	.5	15.6	--	--	3.2
1970	.6	33.3	.9	50.0	.3	16.7	--	--	1.8
1971	1.3	39.4	1.4	42.4	.1	3.0	.5	15.2	3.3
1972	1.0	35.7	1.1	39.3	--	--	.7	25.0	2.8
1973	1.7	58.6	.4	13.8	.1	3.5	.7	24.1	2.9
1974	1.1	50.0	.5	22.7	.2	9.1	.4	18.2	2.2
1975	1.0	35.7	.9	32.1	.5	17.9	.4	14.3	2.8
1976	1.0	27.8	1.2	33.3	.6	16.7	.8	22.2	3.6
1977	1.9	54.3							3.5

Sources: 1. F.A.O., Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.

2. Canadian Department of Industry Trade and Commerce.

C-III Western Europe (non-E.E.C.)

Non-E.E.C. Western European countries do not consume large quantities of Pacific salmon. The largest importing countries appear to be in Scandinavia - primarily Sweden, Norway and Finland. Modest quantities are also sold to Greece, Spain and Switzerland.

C-III-1 Sweden

In Sweden, increasing per capita consumption of fish and high standards of living make the market good for the more expensive kinds of seafoods such as salmon. Salmon imports are increasing from Canada. In 1978, over 1600 tonnes of frozen salmon (mainly chum) were exported from Canada to Sweden. The United States and Canada are the largest suppliers of salmon for the Swedish market. Chum is the biggest seller, and is used for smoking and "graving" or lightly curing. Pink has become important in the last two or three years, and imports of chinook and coho have declined due to higher prices and non-availability. Atlantic salmon from Norway commands the highest import prices whereas Canadian salmon prices are low (30 kr. per kg versus 18 kr. per kg in March 1979). Smoked salmon production from fresh salmon retailed for 207 kr. per kg or \$25 per pound in Stockholm while Canadian salmon, smoked, was selling for one half this price. It is said that there is increasing competition in Sweden from Norway farmed salmon and rainbow trout. Sweden, itself, had salmon landings of 584 tonnes in 1977.

Canned salmon is not popular in Sweden since consumers object to bones and skin in cans. Exports of canned salmon to Sweden from Canada in 1977 amounted to only 24 tonnes.

The Swedish market is projected to absorb 2,935 tonnes of Canadian frozen salmon, 15 tonnes of canned salmon and 50 tonnes of smoked salmon by 1985.

C-III-2 Other Western European Countries (non-E.E.C.)

Finland, with a population of only 4.7 million persons does not provide a large salmon market. Finland's salmon landings from the Baltic were 802 tonnes in 1977. There is a small import requirement for salmon fillets from Canada amounting to \$250,000 in 1977, and there is a current interest in additional sources. Standards of living in Finland are in the mid-range, higher than Britain, Italy or the U.S.S.R., indicating that higher priced products such as salmon would be in demand.

It has been suggested that a stronger effort be made to effectively differentiate in the market between various kinds and qualities of Canadian salmon. There is evidence of a good opportunity for exporting smoked salmon with the possibility of substitution of cultured rainbow trout.

The market projection for exports from Canada to Finland is 130 tonnes of frozen salmon, and 100 tonnes of canned salmon by 1985.

Small quantities of Canadian salmon exports have been exported to Norway and Switzerland. Norway has a farmed salmon production in the order of 2000 tonnes which largely satisfies its own requirements, in addition to being exported from that country to other European markets.

Spain is an expanding market for fish and offers a challenging potential for the Canadian exporter. Significant quantities of salmon are consumed in Spain. Silver bright chum salmon is popular because of its pale red flesh and is sold domestically in frozen or smoked form. Smoked salmon is sold sliced in 100 gram packages or whole sides. Salmon sales are common in small neighborhood specialty shops and open air markets. The tourist trade is very important in Spain, providing potential for salmon restaurant consumption. Nearly 40 million tourists visit Spain each year. Some export potential is hampered by the tariff of 15 percent and tax of 8 percent on frozen salmon entering Spain.

The Spanish market requirements for Pacific salmon from Canada are projected to be 50 tonnes of fresh, 250 tonnes of frozen and 100 tonnes of canned by 1985.

Portugal presents a possible opportunity for selling frozen salmon for consumption by the large tourist trade, however, the state of the economy there inhibits the import of goods. Import restrictions may be relaxed in future because of the short fall in domestic catches caused by the increase in fuel costs and institution of the 200-mile limits by major fish producing nations.

Small quantities of canned, fresh and frozen salmon and salmon roe are exported from Canada to Greece. A potential for increasing exports of pink and chum salmon is noted.

A significant market is not projected for this country because of Government policy designed to reduce the demand for luxury goods. Canadian prices and a long established consumer preference for traditional species have prevented Canada from obtaining a larger portion of Greece's fish import requirements.

The Austrian market presents a very limited opportunity for salmon sales.

C-IV Pacific

The major Pacific markets for salmon are Australia, New Zealand and Japan. Other opportunities are found in the Pacific Islands of Western Samoa, the New Hebrides, and Fiji. Although sales are small, these markets offer continuing sales prospects. Some opportunities for fresh, frozen and smoked salmon are apparent in Hong Kong, Malaysia, Singapore and Thailand although consumption is restricted largely to the foreign community, hotels and airlines. Some canned salmon has also been sold to the Philippines. Virtually no opportunities are available for salmon sales to Korea, India, Burma and China due to import restrictions and controls.

C-IV-1 Australia and New Zealand

Australia has traditionally been a good market for canned salmon with total imports averaging 4.3 thousand tonnes in the decade from 1967 to 1976. During this period Japan supplied most of the market, an average of 3.5 thousand tonnes or 81 percent. Imports were also recorded from Canada, U.S.A. and the U.S.S.R. (Table 18). This market is expected to remain very strong for canned salmon imports especially since Japan, the main supplier will not be a contender in future years. This will leave a gap in the market to be filled by other supplying countries.

TABLE 18 - IMPORTS OF CANNED SALMON TO AUSTRALIA
BY COUNTRY OF ORIGIN

(000 Tonnes)

YEAR	JAPAN	CANADA	U.S.A.	U.S.S.R.	TOTAL ¹
1967	3.1	1.0	.2	.4	4.7
1968	3.6	.4	.1	.1	4.2
1969	4.3	.3	.2	.1	4.9
1970	2.5	.1	.2	.1	2.9
1971	4.7	.1	.3	--	5.1
1972	5.2	.2	.3	--	3.7
1973	3.2	.1	.4	--	3.7
1974	2.4	1.2	.5	--	4.1
1975	2.3	.1	.1	--	2.5
1976	4.2	.5	1.0	--	5.7

¹Total: in some years exports to Australia will be shown in F.A.O. statistics under the heading "exports to other countries" and this total will not include such exports.

Source: F.A.O., Yearbook of Fishery Statistics, Fishery Commodities, Rome, Italy, 1967-76.

Australia has never imported significant quantities of frozen salmon. There is currently (since February 1976) a ban on frozen salmon imports from Canada into Australia. Although this ban is founded on health criteria, it is political in nature and may be lifted at a future date.

Although the demand for salmon in Australia is sensitive to price increases, the market presents a good future potential because of declining supplies of canned salmon from Japan, declining domestic catches and growing population and per capita incomes which are projected to increase significantly by 1985.

New Zealand has also been a small market for canned salmon averaging .8 thousand tonnes in the decade from 1967 to 1976. Japan accounted for 56 percent of the supply in this period, while Canada accounted for nearly all of the remaining quantities. This market therefore provides a potential for increasing exports of canned salmon, projected at 1.1 thousand tonnes from the 675 tonnes recorded 1978.

TABLE 19 - IMPORTS OF CANNED SALMON TO NEW ZEALAND
BY COUNTRY OF ORIGIN
(000 Tonnes)

<u>YEAR</u>	<u>CANADA</u>	<u>JAPAN</u>	<u>TOTAL</u> ¹
1967	.5	.2	.7
1968	.5	.2	.7
1969	.4	.3	.7
1970	.7	.5	1.2
1971	.5	.4	.9
1972	.5	.4	.9
1973	1.0	.5	1.5
1974	.3	.3	.6
1975	.1	.4	.5
1976	.3	.5	.8
1977	.3	n/a	n/a
1978	.6	n/a	n/a

¹ Small quantities from other countries not included in total.

Sources: 1. F.A.O., Yearbook of Fisheries Statistics, Fishery Commodities, Rome, Italy, 1967-76.

2. Canadian Department of Industry Trade and Commerce.

C-IV-2 Japan

The Japanese market presents the most encouraging prospects for Pacific salmon. In 1975 Japanese landings were 166 thousand tonnes, declining to 120 thousand tonnes by 1977. This decline in domestic landings (caused by a reduction in offshore catches - see section A-III) has resulted in increased imports. Salmon imports increased from 3.7 thousand tonnes in 1975 to 49.7 thousand tonnes in 1978 i.e., from 5 percent of their total salmon supplies to 37 percent. It is expected that the import requirement will increase in future years from further offshore fishing reductions. In 1979, however, their offshore salmon quotas remained at the 1978 level of 42.5 thousand tonnes. The sockeye salmon component of this quota declined however by 1/2 million fish or 907 tonnes.

On the demand side, the salmon consumption in Japan at present is estimated to be 150 thousand tonnes. This is a temporary decline from 1975 when it was calculated to be near 200 thousand tonnes. Assuming Japan will maintain domestic landings of 90 thousand tonnes, there is a potential shortfall in that market of 110 thousand tonnes.

Red sockeye salmon constituted 60 percent to 70 percent of the 49,737 tonnes imported to Japan in 1978. If this percentage is maintained, the import potential by 1985 for Japan is projected at 71,500 tonnes of sockeye salmon and 38,500 tonnes of other salmon species. The proportion of salmon imports supplied by Canada in 1978 was 14 percent. It is expected that the Canadian proportion of the market will expand to 25 percent in the future as the result of some alleviation in the stringent export quality controls which were in place in 1978. This will result in a possible export level of B.C. sockeye salmon to Japan of 17.9 thousand tonnes and other salmon of 9.6 thousand tonnes. (The actual exports of B.C. salmon to Japan in 1978 were: coho - 1,935 tonnes, chum - 918 tonnes, chinook - 561 tonnes, sockey - 5,800 tonnes, pink - 200 tonnes).

For salmon roe, it is expected that the market will increase slightly from its present level to approach 10.0 thousand tonnes. Assuming a domestic production level of 1.6 thousand tonnes the import potential will be 8.38 thousand tonnes, an increase of 2.6 thousand tonnes from 1976. In 1976, B.C. roe accounted for 2.0 thousand tonnes or nearly 1/3 of the imports. If this level continues, B.C. will supply 2.8 thousand tonnes by 1981 and 1985.

The Japanese market for Canadian smoked salmon imports is also increasing at a fairly substantial rate going from virtually nothing in 1976 to over \$860 thousand worth in 1978. The major requirement is for red salmon in all forms including mild, medium and hard smoked. Packaging varies from small 100 gram packs of very thinly sliced product to smoked sides. By 1985, it is projected that B.C. exports of this product to Japan will double from the present level.

It is expected that Alaska will continue to supply the lions share of the market because Japanese importers have invested heavily in the Alaska fish processing industry. The fishery occurs there prior to the B.C. fishery and prices have traditionally been lower to Alaskan fishermen and processors.

There is a good potential for marketing salted salmon in Japan as present consumption of this product is near the 100 thousand tonne per year level. Production on factory ships has declined recently from 42 thousand tonnes in 1972 to 21 thousand tonnes in 1976, so that a further phase out of the high seas fishery would result in the need for shore plants to import this product. The actual percent of salt content required is from ten percent to thirty percent. Shore based plants produce two types consisting of a very lightly salted product known as *aramaki* and the remainder is a more heavily salted product known as *yamazuke*. Both products are frozen after salting to preserve flesh colour and to prevent over curing. It is therefore apparent that a further technical study of the Japanese preference should be undertaken to further exploit this market to full potential.

D. Summary and Conclusion

The world landings of Atlantic salmon of 10.7 thousand tonnes in 1977 are at a lower level than in the early 1970's. These will probably increase in future years as a result of an extensive salmon farming operation in Norway. Canada and other European countries are also embarking on enhancement programs but significant effects from these countries will not occur by 1985. Since Canada's production is small (only 2.1 thousand tonnes) and is presently being sold under lucrative market conditions, no change is predicted in marketing patterns for this species in the short term future.

Pacific salmon landings, averaging 400.1 thousand tonnes in the four years from 1974 to 1977, increased to 465 thousand tonnes in 1977 and are expected to continue increasing perhaps by as much as 2 percent per year resulting in an increment in world production by 1985 of 55 thousand tonnes. Canada's landings of 55.7 thousand tonnes (average 1974-77) are projected to increase to 90 thousand tonnes by 1985.

The extension of jurisdiction by major fishing nations of the world has had an effect on trading mainly by reducing Japan's high seas salmon catch. Japan's catch on the high seas prior to 1977 was reported to be as high as 75 thousand tonnes. This has been reduced to 42,500 tonnes and may be phased out completely in future years. The salmon formerly caught by Japan are now being taken by the U.S.S.R. and the United States. Both of these countries experienced sharp increases in landings in 1977 from the previous year. The result of the change in landings has been to alter Japan's status from a substantial exporter of salmon to a large importer.

The repercussions of these developments have been apparent in the world salmon markets, firstly by causing a large Japanese demand for frozen salmon imports from North America (increasing from virtually nil in 1976 to 49 thousand tonnes in 1978), and secondly, by a nearly complete phase out of the Japanese canned salmon industry. The fact that the U.S.S.R. is not exporting its increment in production to the major salmon markets leaves more opportunity for Canada and the United States to fill the void.

Coinciding with these developments is a general overall increase in demand for salmon products on a world wide scale, but especially for red salmon (salted, smoked, fresh and frozen) in Japan and for salmon for fresh (thawed) or smoked consumption in Europe. The major species in demand in Europe are chum, chinook and coho salmon. The increase in world demand for salmon has been associated with rapidly rising disposable incomes in the major consuming countries and exchange rates vis-à-vis the United States and Canadian dollar. Increasing populations have also had an effect but to a smaller degree.

The overall effect is that the major markets for Canadian salmon are expected to be able to absorb 115 thousand tonnes of Canadian salmon in round weight equivalent by 1985. Since production levels will only be at 90 thousand tonnes, the shortfall may manifest itself in higher prices. Major opportunities for increasing Canadian canned sales will arise in the United Kingdom, Belgium/Luxembourg, the Netherlands and Australia. Frozen sales will increase to Japan, France, Sweden, Denmark, the Netherlands and Finland. A development which will occur in future years is that the frozen market will continue to draw salmon away from canned use especially for sockeye salmon. The lower supplies in canned markets will cause prices to rise and correspondingly a shift in consumption to lower priced canned salmon and canned tuna. The domestic market for canned salmon will be substantially affected by this shift since this market presently accounts for over 40 percent of the total (round weight equivalent) product.

An aspect not emphasized enough in this report is the possibility of producing further processed high valued salmon products for export to Japan and European countries. In Japan there is an enormous market for salted salmon in addition to smoked and steaked products, while in Europe most of the Canadian salmon is further processed into smoked products. This will probably only be economically practical in instances where production costs in Canada are lower than in the importing country as prices will have to remain competitive with other suppliers.

To determine a market priority for salmon to 1985, the total quantity (round weight) projected to be sold on each market is indicated in Table 16 in Appendix II. The domestic market is the most important, followed by Japan, the U.K., France, Belgium/Luxembourg, Sweden, Australia, United States, the Netherlands, Denmark, West Germany, Italy, Spain and Finland. For canned salmon the best opportunities will be found in Canada, the U.K. and Australia while for frozen salmon, Japan, Canada and France are projected to be the most important.

APPENDIX I

CANADIAN SALMON MARKETS WITH PROJECTIONS
FOR 1981 AND 1985

NOTE: - EXPORT STATISTICS OBTAINED FROM STATISTICS CANADA,
EXPORTS BY COMMODITIES, DEC. 1976, 1977 and 1978.

TABLE 1: CANADIAN CONSUMPTION OF SALMON PRODUCTS
WITH PROJECTIONS FOR 1981 AND 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Frozen					
Spring (Chinook)	819.2	1919.9	587.5	2380*	3321*
Coho	-	1470.7	.4	1870*	2829*
Chum	876.0	969.6	2383.9	2635*	3690*
Other	282.1	1228.0	-	1615*	2460*
Total	1977.3	5588.2	2971.8	8500*	12300*
<u>CANNED</u>					
Coho	1217.9	1189.3	1542.2	1881	2160
Chum	2389.5	2624.1	2042.4	2394	2520
Pink	5046.9	7654.2	7931.5	6669	6840
Sockeye	3441.5	5543.7	5628.0	5985	6300
Other	108.0	377.9	3.0	171	180
Total	12203.8	17389.2	17147.1	17100.0	18000.0
Total	14181.1	22977.4	20118.9	N/A	N/A
Population (Million)	23.1	23.3	23.5	24.3	25.4

*Includes fresh salmon consumption.

Notes: 1. In calculating this table it was necessary to estimate the species composition of imports as these data are not separated out by species in Canadian import statistical publications. The estimates were based on an inverse relationship to inventories held by the major salmon canners.

2. - indicates that a negative consumption was determined.

TABLE 2: EXPORTS OF CANADIAN SALMON TO THE U.S.A. BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	198.0	172.0	187.0	195.0	200.0
Coho	59.0	119.0	266.0	300.0	300.0
Chum	---	---	---	---	---
Other	279.0	944.0	686.0	820.0	840.0
Total	536.0	1235.0	1139.0	1315.0	1340.0
<u>Frozen</u>					
Spring (Chinook)	1388.0	1079.0	1040.0	1107.0	1107.0
Coho	241.0	246.0	92.0	100.0	100.0
Chum	633.0	355.0	341.0	344.0	344.0
Other	168.0	260.0	450.0	460.0	460.0
Total	2430.0	1940.0	1923.0	2011.0	2011.0
<u>Canned</u>					
Coho	---	---	30.0	50.0	50.0
Chum	2.0	---	67.0	50.0	50.0
Sockeye	1.0	132.0	127.0	130.0	130.0
Pink	318.0	48.0	1.0	150.0	150.0
Other	53.0	---	31.0	50.0	50.0
Total	374.0	180.0	256.0	430.0	430.0
Smoked & Spec.	49.0	87.0	100.0	87.0	87.0
<u>ATLANTIC</u>					
Fresh	57.0	73.0	81.0	50.0	50.0
Frozen	109.0	70.0	97.0	100.0	100.0
Total	166.0	143.0	178.0	150.0	150.0
Canadian Total	3555.0	3585.0	3596.0	3993.0	4018.0
Total Imports of Salmon	4645.0	N/A	N/A	4050.0	4100.0
Population	215.9	216.8	219.7	222.2	232.2

TABLE 3: EXPORTS OF CANADIAN SALMON TO THE U.K. BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	.9	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	1.1	---	---	---	---
Total	2.0	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	28	7	129	100	100
Chum	526	331	534	600	600
Coho	128	92	181	225	225
Other	66	93	58	50	50
Total	748	523	902	975	975
<u>Canned</u>					
Coho	275	154	230	750	1000
Chum	75	---	---	---	---
Sockeye	2042	3174	2901	3750	5000
Pink	1461	1846	1464	2625	3500
Other	9	184	114	375	500
Total	3862	5358	4709	7500	10000
Smoked & Spec.	---	2	---	---	---
<u>Atlantic</u>					
Fresh	---	---	---	---	---
Frozen	14	14	36	38	40
Total	14	14	36	38	40
Canadian Total	4626	5897	5647	6588	6590
Total Imports of Salmon	21481	17172	N/A	17000	17000
Population (Million)	56.0	56.0	56.0	56.0	56.0

TABLE 4 : EXPORTS OF CANADIAN SALMON TO DENMARK BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	9.0	---	11.9	15.0
Coho	---	---	---	---	2.0
Chum	---	---	---	---	---
Other	---	5.0	---	7.9	9.9
Total	---	14.0	---	19.8	26.9
<u>Frozen</u>					
Spring (Chinook)	26.0	21.0	24.0	18.1	22.0
Chum	557.0	738.0	1071.0	925.1	1003.1
Coho	38.0	5.0	3.0	15.0	15.0
Other	172.0	290.0	135.0	201.9	223.1
Total	793.0	1054.0	1233.0	1160.1	1263.2
<u>Canned</u>					
Coho	21.0	1.0	---	3.1	3.1
Chum	---	---	---	---	---
Sockeye	.5	1.0	1.0	2.0	9.9
Pink	20.0	26.0	43.0	35.1	67.2
Other	1.2	7.0	---	9.9	11.9
Total	42.7	35.0	44.0	50.1	92.1
Smoked & Spec.	---	---	---	---	---
<u>ATLANTIC</u>					
<u>Fresh</u>					
Frozen	10.0	38.0	1.0	50.0	70.0
Total	10.0	38.0	1.0	50.0	70.0
Canadian Total	845.7	1141.0	1278.0	1280.0	1452.2
Total Imports of Salmon	N/A	N/A	N/A	N/A	N/A
Population (Million)	5.1	5.2	N/A	5.2	5.3

TABLE 5: EXPORTS OF CANADIAN SALMON TO FRANCE BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	17.0	1.0	---	---	---
Coho	11.0	---	---	---	---
Chum	---	---	---	---	---
Other	6.0	---	---	---	---
Total	34.0	1.0	---	---	---
<u>Frozen</u>					
Spring (Chinook)	1145.0	1120.0	1246.0	1250.0	1250.0
Coho	2409.0	3211.0	3283.0	3300.0	3400.0
Chum	151.0	206.5	472.0	510.0	580.0
Other	73.0	419.0	210.0	300.0	400.0
Total	3778.0	4956.5	5211.0	5360.0	5630.0
<u>Canned</u>					
Coho	---	40.0	4.0	---	---
Chum	39.0	236.0	102.0	125.0	150.0
Sockeye	2.0	7.0	5.0	---	---
Pink	117.0	228.0	74.0	150.0	150.0
Other	---	64.0	17.0	---	---
Total	158.0	575.0	202.0	275.0	300.0
Smoked & Spec.	---	---	---	---	---
<u>ATLANTIC</u>					
<u>Fresh</u>					
Frozen	2.0	19.0	44.0	---	---
Total	2.0	19.0	44.0	---	---
CANADIAN TOTAL	3972.0	5551.5	5457.0	5635.0	5930.0
TOTAL IMPORTS (SALMON)	11900.0	15835.0	N/A	18800.0	22000.0
POPULATION (MILLION)	52.8	53.1	53.2	55.1	57.1

TABLE 6: EXPORTS OF CANADIAN SALMON TO WEST GERMANY BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	<u>1976</u> (M.T.)	<u>1977</u> (M.T.)	<u>1978</u> (M.T.)	<u>1981</u> (M.T.)	<u>1985</u> (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	41.0	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	41.0	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	275.0	198.0	298.0	316.0	329.0
Coho	162.0	88.0	67.0	60.0	60.0
Chum	585.0	592.0	625.0	700.0	779.0
Other	46.5	78.4	34.0	---	---
Total	1068.5	956.4	1024.0	1076.0	1168.0
<u>Canned</u>					
Coho	---	1.0	---	---	---
Chum	7.0	---	---	---	---
Sockeye	5.4	1.0	---	---	---
Pink	42.0	17.0	25.0	30.0	30.0
Other	.9	---	---	---	---
Total	55.3	19.0	25.0	30.0	30.0
Smoked & Spec.	80.7	19.0	---	---	---
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	182.0	383.0	141.0	200.0	260.0
Total	182.0	383.0	141.0	200.0	260.0
Canadian Total	1 427.5	1377.4	1190.0	1306.0	1431.0
Total Imports of Salmon	N/A	3537.0	3505.0	N/A	N/A
Population (Million)	61.5	61.4	61.2	60.5	59.7

TABLE 7: EXPORTS OF CANADIAN SALMON TO ITALY BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	---	---	---	---	---
<hr/>					
Frozen					
Spring (Chinook)	354.0	247.0	227.0	280.0	325.0
Coho	192.0	163.0	101.0	175.0	200.0
Chum	66.0	42.6	41.0	---	---
Other	41.0	23.0	29.0	---	---
Total	653.0	475.6	398.0	455.0	525.0
<hr/>					
Canned					
Coho	1.0	3.0	---	---	---
Chum	23.5	17.2	2.0	15.0	25.0
Sockeye	8.5	10.0	9.0	10.0	15.0
Pink	135.0	225.0	267.0	280.0	310.0
Other	3.0	22.5	7.0	20.0	25.0
Total	171.0	277.7	285.0	325.0	375.0
<hr/>					
Smoked & Spec.	---	---	2.0	2.3	2.6
<hr/>					
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	---	---	---	---	---
Total	---	---	---	---	---
<hr/>					
Canadian Total	824.0	753.3	683.0	780.0	900.0
Total Imports of Salmon	1100.0	1540.0	N/A	1600.0	1800.0
Population (Million)	55.0	56.0	56.9	57.5	59.0

TABLE 8: EXPORTS OF CANADIAN SALMON TO THE NETHERLANDS BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	---	---	---	---
Coho	.5	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	.5	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	116.0	47.5	85.0	100.0	100.0
Coho	100.0	120.0	107.0	100.0	100.0
Chum	90.0	38.0	44.0	50.0	50.0
Other	28.0	20.0	47.0	40.0	100.0
Total	334.0	225.5	283.0	290.0	350.0
<u>Canned</u>					
Coho	3.8	35.0	33.0	---	---
Chum	5.4	62.0	---	---	---
Sockeye	72.0	118.0	149.0	300.0	400.0
Pink	52.0	538.0	666.0	700.0	800.0
Other	---	---	85.0	400.0	500.0
Total	133.2	753.0	933.0	1400.0	1700.0
Smoked & Spec.	---	---	---	---	---
<u>ATLANTIC</u>					
<u>Fresh</u>					
Fresh	---	---	---	---	---
Frozen	1.4	---	---	---	---
Total	1.4	---	---	---	---
Canadian Total	469.1	978.5	1216.0	1690.0	2050.0
Total Imports (Salmon)	5330.0	5000.0	6060.0	6200.0	6800.0
Population (Million)	13.8	13.9	14.0	14.2	14.5

TABLE 9: EXPORTS OF CANADIAN SALMON TO BELGIUM/LUXEMBOURG BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	---	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	169.6	41.0	33.0	35.0	37.0
Coho	160.4	448.0	288.0	285.0	300.0
Chum	2.5	49.0	35.0	66.0	66.0
Other	---	27.0	30.0	66.0	66.0
Total	332.5	565.0	386.0	452.0	469.0
<u>Canned</u>					
Coho	15.3	18.5	9.0	---	---
Chum	117.0	203.5	82.0	89.0	93.0
Sockeye	143.0	293.0	300.0	317.0	324.0
Pink	882.0	1282.0	1447.0	1535.0	1557.0
Other	15.2	26.0	27.0	30.0	30.0
Total	1172.5	1823.0	1865.0	1971.0	2004.0
Smoked & Spec.	---	---	---	---	---
<u>ATLANTIC</u>					
<u>Fresh</u>					
Frozen	2.3	---	1.0	---	---
Total	2.3	---	1.0	---	---
Canadian Total	1507.2	2388.0	2252.0	2423.0	2473.0
Total Imports of Salmon	6765.0	5805.0	N/A	N/A	N/A
Population (Million)	10.2	10.3	10.3	10.4	10.6

Table 10: EXPORTS OF CANADIAN SALMON TO FINLAND BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
<u>Total</u>	---	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	---	1.5	---	---	---
Coho	---	.5	---	---	---
Chum	---	4.5	11	15	25
Other	---	3.0	13	15	25
<u>Total</u>	---	9.5	24	30	50
<u>Canned</u>					
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Sockeye	---	---	---	---	---
Pink	---	---	---	---	---
Other	---	---	---	---	---
<u>Total</u>	---	---	---	---	---
Smoked & Spec.	---	2.0	---	---	---
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	---	---	---	---	---
<u>Total</u>	---	---	---	---	---
Canadian Total	---	11.5	24.0	30.0	50.0
Total Imports of Salmon	394.0	239.2	---	---	---
Population (Million)	4.7	4.7	4.7	4.7	4.7

TABLE 11: EXPORTS OF CANADIAN SALMON TO SWEDEN BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	20.0	---	---	---
Total	---	20.0	---	---	---
<hr/>					
Frozen					
Spring (Chinook)	131.4	37.6	84.0	100.0	100.0
Coho	53.0	27.0	32.0	---	---
Chum	1197.0	732.0	1284.0	1275.0	1835.0
Other	182.0	742.0	241.0	715.0	1000.0
Total	1563.4	1538.6	1641.0	2090.0	2935.0
<hr/>					
Canned					
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Sockeye	---	---	---	---	---
Pink	2.0	---	5.0	---	---
Other	1.5	5.0	---	10.0	15.0
Total	3.5	5.0	5.0	10.0	15.0
<hr/>					
Smoked & Spec.	33.2	24.0	---	30.0	50.0
<hr/>					
<u>ATLANTIC</u>					
Fresh	---	15.0	---	---	---
Frozen	102.0	6.0	5.0	5.0	5.0
Total	102.0	21.0	5.0	5.0	5.0
<hr/>					
CANADIAN TOTAL	1702.1	1590.6	1651.0	2135.0	3005.0
TOTAL IMPORTS OF SALMON	N/A	N/A	N/A	N/A	N/A
POPULATION (MILLION)	8.2	8.3	N/A	8.3	8.4

TABLE 12:

EXPORTS OF CANADIAN SALMON TO SPAIN BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	15	---	30	50
Total	---	15	---	30	50
<u>Frozen</u>					
Spring (Chinook)	4.5	10	---	---	---
Coho	4.5	---	---	---	---
Chum	14.6	20	49	---	---
Other	---	.1	---	150	250
Total	23.6	30.1	49	150	250
<u>Canned</u>					
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Sockeye	.9	---	136	100	100
Pink	---	---	---	---	---
Other	---	---	---	---	---
Total	.9	---	136	100	100
Smoked & Spec.	---	2	---	---	---
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	---	---	---	---	---
Total	---	---	---	---	---
Canadian Total	24.5	47.1	185	280	400
Total Imports of Salmon	N/A	386	N/A	415	490
Population (Million)	35.8	36	N/A	38	40

TABLE 13: EXPORTS OF CANADIAN SALMON TO AUSTRALIA BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	.9	---	---	---	---
Total	.9	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	8.5	---	10.0	15.0	20.0
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	3.4	---	---	5.0	10.0
Total	11.9	---	10.0	20.0	30.0
<u>Canned</u>					
Coho	7.1	81.0	---	175	200
Chum	---	1.0	---	---	---
Sockeye	270.0	745.0	717.0	1050	1200
Pink	191.0	1776.0	722.0	2100	2400
Other	20.6	55.3	1.0	175	200
Total	488.7	2658.3	1440.0	3500	4000
Smoked & Spec.	21.5	20.2	---	21.5	21.5
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	---	---	---	---	---
Total	---	---	---	---	---
Canadian Total	523.0	2678.5	1450.0	3735.0	4515.0
Total Imports of Salmon	5700.0	N/A	N/A	6000.0	6200.0
Population (Million)	13.7	14.1	N/A	15.1	16.5

TABLE 14: EXPORTS OF CANADIAN SALMON TO NEW ZEALAND BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
<u>Fresh</u>					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	---	---	---	---	---
<u>Frozen</u>					
Spring (Chinook)	---	---	---	---	---
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Other	---	---	---	---	---
Total	---	---	---	---	---
<u>Canned</u>					
Coho	1	3	35	35	40
Chum	112	37	32	35	40
Sockeye	245	72	63	75	90
Pink	1,029	276	516	750	850
Other	88	28	29	30	35
Total	1,475	416	675	925	1,055
Smoked & Spec.	2	---	2	3	5
<u>Atlantic</u>					
Fresh	---	---	---	---	---
Frozen	---	---	---	---	---
Total	---	---	---	---	---
Canadian Total	1,477	416	677	928	1,060
Total Imports of Salmon	N/A	N/A	N/A	N/A	N/A
Population (Millions)	3.1	3.1	N/A	3.3	3.5

TABLE 15:

EXPORTS OF CANADIAN SALMON TO JAPAN BY PRODUCT
AND SPECIES WITH PROJECTIONS TO 1985

	1976 (M.T.)	1977 (M.T.)	1978 (M.T.)	1981 (M.T.)	1985 (M.T.)
<u>PACIFIC</u>					
Fresh					
Spring (Chinook)	1.0	---	2.0	5.0	5.0
Coho	2.0	---	28.0	25.0	30.0
Chum	---	---	---	---	---
Other	---	---	3.0	5.0	5.0
Total	3.0	---	33.0	35.0	40.0
<u>Frozen</u>					
Spring (Chinook)	60.0	502.0	561.0	1029.0	1650.0
Coho	107.0	785.0	1935.0	3600.0	5775.0
Chum	2.1	334.0	918.0	1714.0	2750.0
Other	169.0	1504.0	5963.0	10801.0	17325.0
Total	338.1	3125.0	9377.0	17144.0	27500.0
<u>Canned</u>					
Coho	---	---	---	---	---
Chum	---	---	---	---	---
Pink	---	---	---	---	---
Sockeye	.9	---	---	---	---
Other	---	---	16.0	20.0	20.0
Total	.9	---	16.0	20.0	20.0
Smoked & Spec.	3.2	2.3	102.3	204.7	307.0
<u>ATLANTIC</u>					
Fresh	---	---	---	---	---
Frozen	---	19.0	14.0	15.0	15.0
Total	---	19.0	14.0	15.0	15.0
Canadian Total	345.2	3146.3	9542.3	17419.0	27882.0
Total Imports of Salmon	1678.3	8754.4	49737.0	100000.0	111000.0
Population (Million)	113.1	114.2	N/A	117.6	122.1

APPENDIX II

SALMON MARKET PROJECTION ASSUMPTIONS

Table 16

CANADIAN SALMON MARKET FORECAST - MAJOR MARKETS (TONNES)

	FROZEN 1981					CANNED					FROZEN 1985					CANNED						
	Spring	Coho	Chum	Other	Total	Coho	Chum	Pink	Sockeye	Other	Total	Spring	Coho	Chum	Other	Total	Coho	Chum	Pink	Sockeye	Other	Total
North Amer.																						
Can.	2380 ¹	1870 ¹	2635 ¹	1615 ¹	8500 ¹	1881	2394	6669	5985	171	17100	3321 ¹	2829 ¹	3690 ¹	2460 ¹	12300 ¹	2160	2520	6840	6300	180	12000
U.S.A.	1107	100	344	460	2011	50	50	130	150	50	430	1107	100	344	460	2011	50	50	150	130	50	430
West. Eur. (E.E.C.)																						
U.K.	100	225	600	50	975	750	0	3750	2625	375	7500	100	225	600	50	975	1000	0	5000	3500	500	10000
Denmark	18	15	925	202	1160	3	0	35	2	10	50	22	15	1003	223	1263	3	0	67	10	12	92
France	1250	3300	510	300	5360	0	125	150	0	0	275	1250	3400	580	400	5630	0	150	150	0	0	300
W. Ger.	316	60	700	0	1076	0	0	0	30	0	30	329	60	779	0	1168	0	0	0	30	0	30
Italy	280	175	0	0	455	0	15	10	280	20	325	325	200	0	0	525	0	25	310	15	25	375
Neth.	100	100	50	40	290	0	0	700	300	400	1400	100	100	50	100	350	0	0	800	400	500	1700
Bel/Lux	35	285	66	66	452	0	89	1535	317	30	1971	37	300	66	66	469	0	93	1557	324	30	2004
West. Eur. (NON EEC)																						
Finland	0	0	15	15	30	0	0	0	0	0	0	0	0	25	25	50	0	0	0	0	0	0
Sweden	100	0	1275	715	2090	0	0	0	0	10	10	100	0	1835	1000	2935	0	0	0	0	15	15
Spain	0	0	0	150	150	0	0	0	100	0	100	0	0	0	250	250	0	0	0	100	0	100
Pacific																						
Austr.	15	0	0	5	20	175	0	1050	2100	175	3500	20	0	0	10	30	200	0	1200	2400	200	4000
N. Zeal.	0	0	0	0	0	35	35	75	750	30	925	0	0	0	0	0	40	40	90	850	35	1055
Japan	1029	3600	1714	10801	17144	0	0	0	0	20	20	1650	5775	2750	17325	27500	0	0	0	0	20	20
TOTAL	6730	9730	8854	14419	39713	2894	2708	14104	12639	1291	33636	8361	13004	11722	22369	55456	3453	2878	16164	14059	1567	38121
Conversion																						
Total Round	8076	11676	10601	17303	47656	4225	3954	20592	18453	1885	49109	10033	15605	14066	26843	66547	5041	4202	23599	20526	2288	55656

¹ Includes fresh salmon consumption.

1. Canada
 - (a) per capita consumption of canned salmon will remain at present levels, while fresh and frozen salmon consumption will increase to .31 kg. per capita.
 - (b) population will increase to 24.3 million by 1981 and to 25.4 million by 1985.
2. United States
 - (a) the present trade in frozen salmon will continue to 1981 and 1985.
 - (b) the canned trade will increase very slightly because of close trading ties, market proximity, and increasing population.
3. United Kingdom
 - (a) frozen salmon per capita consumption will continue to increase for smoking.
 - (b) the quality of Canadian frozen salmon will remain better than that from the United States.
 - (c) Canada will increase exports to the 1967 and 1969 quantities to the U.K. of canned salmon. This will only be possible if Japanese supplies continue to be low and if the U.S.S.R. and U.S.A. do not increase their shares of the market substantially.
4. France
 - (a) for frozen salmon it is assumed that Canada will supply slightly increasing quantities because of increasing per capita consumption and population. Total frozen salmon imports will grow at a faster pace than those exports from Canada because of increased farmed salmon supplies from Norway.
 - (b) for canned salmon, Canada's exports to France will not increase significantly from the 1978 level because of competition from the U.S.S.R.
5. Denmark
 - (a) the Danish market is expected to remain firm for frozen and canned salmon. A slight increase is projected based on population increase.
6. West Germany
 - (a) this market will remain strong for imports due to a projected ten percent annual growth in smoked salmon production in future years.
 - (b) the price of Canadian salmon supplies must remain competitive with those available from Norway.
7. Italy
 - (a) the present quantities of salmon exported by Canada to Italy will continue, providing Canada's share of the market continues to increase and prices remain competitive.

8. The Netherlands

- (a) an increase in Canadian canned salmon exports is projected to this market, based on a continuation of the increase from 1976-1978. This assumes that Japan and the U.S.S.R. will not be contenders in the market in future years and that export demand for products from the Netherlands remains strong.
- (b) frozen salmon exports to this country from Canada will increase slightly providing the quality of product available from Canada remains good and prices remain competitive.

9. Belgium and Luxembourg

- (a) a slight increase in Canadian canned exports to these countries are projected based on past years' increases. This assumes that Canada will obtain a larger share of the market as supplies are not available from Japan.
- (b) a holding pattern for Canadian exports of frozen salmon is projected to continue based on a continuation of the present consumer resistance to frozen fish.

10. Sweden

- (a) a good increase in frozen exports is predicted based on a continuation of the present increases in per capita consumption, and high levels of disposable income. This increase assumes that Canadian prices will remain below prices of salmon from Norway.

11. Finland

- (a) a slight increase was forecast based on some potential for marketing smoked salmon and good quality salmon fillets.

12. Spain

- (a) a small increase in exports of frozen salmon based on increasing per capita consumption and population. This assumes that Canada will supply good quality salmon at favourable prices.

13. Australia and New Zealand

- (a) canned sales to Australia are projected to increase significantly providing supplies continue to be unavailable from Japan.
- (b) a slight increase in canned sales is forecast for New Zealand due to the unavailability of canned supplies from Japan, and the recent import levels from Canada.

14. Japan

the projection is for Japan to increase frozen salmon imports from Canada by over three times the 1978 level. This is based on the following assumptions:

- (a) Japan will maintain domestic landings of only 90 thousand tonnes through a complete phase out of that countries high seas fishing industry.

- (b) Consumption of salmon in Japan will increase to the 1975 level of 200 thousand tonnes, resulting in an import requirement of 110 thousand tonnes.
- (c) The Canadian proportion of Japan's import requirement will expand to 25 percent in future years.

