ANNEX TO THE WORLDWIDE FISHERIES MARKETING STUDY: PROSPECTS TO 1985

SALMON

REVISED 1980

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

(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

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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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E. Wong
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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 a new dynamic 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 global potential on a country and species basis.

Specifically, the purpose of the Study is to identify the longer term market opportunities for selected traditional and non-traditional species in existing and prospective markets and to identify factors which may hinder or help Canadian fisheries trade in world markets. To date, over 40 country markets and 8 species groups have been analyzed. It should be noted that while the information contained in the Reports was up-to-date when collected, some information may now be dated given the speed with which changes are occurring in the marketplace. In this same vein, the market projections 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 GATT 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. The results of the Study should, therefore, 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

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Ottawa

WORLDWIDE FISHERIES MARKETING STUDY

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A. INTRODUCTION

Canadian fishermen harvest Pacific salmon along the west coast and Atlantic salmon on the east coast. Both salmonid groups are anadromous, spending a great deal of life at sea and returning to fresh water only for spawning. The scientific name for Atlantic salmon is Salmo salar, while Pacific salmon comprise of five distinct species from the genus oncorhynchus. In contrast to 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 inhabit waters of the North Atlantic Ocean and return to estuaries in Europe and North America for spawning. Both North American and European salmon migrate to southern Greenland waters, where they have been fished commercially. Recently quotas have been established (of about 1 270 tonnes) for Greenland fishermen in bilateral consultations with Canada and European countries.

Over the past 50 years Atlantic salmon have become scarce on both sides of the ocean and efforts are now being directed toward revitalizing stocks. World landing statistics show a decline in commercial catches from 16 480 tonnes in 1974 to 7 997 tonnes in 1978. Ireland, Scotland, Denmark and Norway record the largest landings by Europe, while Canada is the major North American supplier.

Currently, a new management program for the commercial fishery in Atlantic Canada is being implemented, which involves reducing salmon interceptions in sea fisheries, establishing quotas and licensing fisherman. Quotas are being allowed in New Brunswick after a nine year ban on commercial fishing. The commercial catch of Atlantic salmon in New Brunswick totalled 27 670 fish in 1971. Scientific evidence suggests the stocks have recovered sufficiently to sustain a catch of 50 000 fish in 1981.

TABLE 1
World Atlantic salmon landings, 1974-1978

	1974	1975	1976	1977	1978
	(Tonnes round weight)				
Europe - inland waters					
Poland	--	--	--	--	17
Finland	25	55	93	83	64
Iceland	225	266	225	230	291
Norway	--	--	--	--	--
Sweden	--	--	--	--	--
UK (England & Wales)	1 896	--	--	--	--
Sub total	2 146	321	318	313	372
North West Atlantic - west of 59° N.					
Canada	2 221	2 190	2 209	2 155	1 232
Denmark	505	381	--		--
Faroe Islands	110	260	--	--	--
Greenland	1 162	1 187	1 175	1 414	984
Norway	140	220	--	--	--
St. Pierre and Miquelon	--	--	--	--	--
US	0	0	0	0	0
Sub Total	4 138	4 238	3 384	3 569	2 216
North East Atlantic - east of 59° N.					
Denmark	1 385	1 467	1 685	1 214	950
Faroe Islands	--	28	40	40	37
Finland	747	697	688	699	538
France	1	4	2	--	2
Germany F.R.	53	81	65	36	17
Greenland	--	--	--	6	8
Ireland	2 068	2 188	1 492	1 305	1 179
Norway	1 399	1 280	1 099	1 184	809
Poland	119	88	103	80	87
Portugal	17	0	0	0	0
Sweden	665	644	623	619	494
USSR	1 926	1 345	213	344	170
UK (England, Wales)	400	358	--	--	--
UK (Scotland)	1 232	1 243	790	1 131	968
UK (Ireland)	184	164	114	111	150
Sub total	10 196	9 587	6 914	6 769	5 409
World total	16 480	14 146	10 617	10 651	7 997

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

Source: - FAO, Yearbook of Fishery Statistics, Catches and Landings, Vol. 46, Table B-23, Rome, Italy, 1978.

Coinciding with this new program, an enhancement proposal, if funded, and implemented, would double the total catch in Canada by 1990. (By 1985 significant results would not occur).

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 tsawytcha). There is another species found only in Asia called cherry salmon (Oncorhynchus masou).

The sockeye salmon is relatively small, averaging six pounds and is prized for its red, firm flesh. It is the species upon which the British Columbia canning industry was built but is now becoming popular as a frozen product. This species has a life cycle of four to six years and is caught predominantly with net gear, but recently trollers have caught increasing quantities. Troll caught sockeye and other salmon are generally superior in quality to net caught, and therefore command higher prices for fisherman and wholesalers.

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, pink salmon, in the past, has been marketed almost exclusively in canned form. It is usually caught with net gear, although trollers have been successful in some years.

The chum salmon is quite large, averaging 11 pounds. Though historically used widely for canning, a unique characteristic of this species is that the flesh deteriorates rapidly when it enters fresh water, whereas when caught in salt water it is usually in the "silverbright" stage and is suitable for sale as a fresh, frozen product. 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 a one half pounds. It has a life cycle of 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 hundered 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 has made poor canning fish and has been used primarily 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 426 000 tonnes during the years from 1975 to 1978. The 1977 catch was unusually higher than in other recent years at 469 000 tonnes (Table 2). World landings in the 1960's averaged 405 000 tonnes, a slight decline from the 1950's average of 460 000 tonnes.

There are four major salmon producing countries: Japan, United States, Canada, and the USSR. 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 EC countries, Scandinavia, Australia and New Zealand.

In the five years from 1973 to 1977, Japan accounted for the highest production - 34.4% of the average annual catch - followed by the US at 29.7%, and Canada at 13.9%. In 1977 Japan dropped to the third position at 120 200 tonnes while the USSR at 131 000 tonnes was the second highest producer. In 1978 Japan's catch dropped to 107 000 tonnes but increased significantly in 1979 because of higher domestic runs (see section C-IV-2).

The world catch is made up mostly of pink salmon accounting for 41.0% of the annual average (75 to 78) followed by chum at 29.3%, sockeye at 14.0%, coho at 7.8%, and chinook at 6.1%.

TABLE 2
World Pacific salmon landings by country and species, 1975-1978

(Tonnes, round weight)

		1975	1976	1977	1978	1975/78 Average	%
JAPAN	Pink	45 936	29 629	35 264	17 176	32 001	
	Chum	99 485	78 417	71 931	74 090	80 981	
	Cherry	3 871	3 814	3 822	3 600	3 777	
	Sockeye	7 733	8 844	4 499	5 170	6 562	
	Chinook	1 115	1 604	908	1 075	1 176	
	Coho	8 161	7 697	3 757	5 755	6 343	
	Total	166 301	130 005	120 181	106 866	130 840	30.7
USSR	Pink	88 415	53 748	107 496	53 413	75 768	
	Chum	7 691	10 015	14 678	16 669	12 263	
	Sockeye	1 399	1 170	1 869	3 382	1 955	
	Chinook	2 229	1 956	3 099	2 948	2 558	
	Coho	3 310	3 556	4 009	2 384	3 315	
	Total	103 044	70 445	131 151	78 796	95 859	22.5
USA	Pink	25 492	45 014	56 992	88 394	53 973	
	Chum	15 330	23 880	26 036	22 900	22 037	
	Sockeye	23 734	37 721	40 793	44 773	36 755	
	Chinook	14 176	15 654	14 822	13 507	14 540	
	Coho	12 710	18 003	13 604	13 901	14 555	
	Total	91 442	140 272	152 247	183 475	141 860	33.3
CANADA	Pink	10 239	17 056	24 723	15 331	16 837	
	Chum	5 389	10 922	6 032	15 855	9 550	
	Sockeye	5 681	12 339	17 388	22 321	14 432	
	Chinook	7 289	7 776	7 522	7 887	7 619	
	Coho	7 737	9 322	9 857	9 152	9 017	
	Total	36 335	57 415	65 522	70 546	57 455	13.5
WORLD TOTAL	Pink	170 082	145 447	224 475	174 314	178 580	41.9
	Chum	127 895	123 234	118 677	129 514	124 830	29.3
	Cherry	3 871	3 814	3 822	3 600	3 777	0.9
	Sockeye	38 547	60 074	64 549	75 646	59 704	14.0
	Chinook	24 809	26 990	26 351	25 417	25 892	6.1
	Coho	31 918	38 578	31 227	31 192	33 229	7.8
	Total	397 122	398 137	469 101	439 683	426 012	100.0

Source: - FAO Yearbook of Fishery Statistics, Catches and Landings, Vol. 46, B-23 Table, Rome, Italy, 1978.

Historically, salmon production from countries other than Canada has been declining about 1.8 % annually. There are however, salmonid enhancement programs in Washington, Oregon, Alaska, the USSR, Japan and some other East Asian countries. It is possible that these programs could increase output by as much as 2% annually.

In 1978, BC Pacific salmon landings (round weight) were 70 600 tonnes, made up of 15 855 tonnes of chum, 15 331 tonnes of pink, 9 152 tonnes of coho, 22 321 tonnes of sockeye, and 7 887 tonnes of chinook salmon. The quantities landed of each species vary considerably from year to year especially for sockeye, pink and chum salmon.

BC's salmon landings have declined over the years, with the average catch for the 1970-77 period more than one-third less than the average for the 1925-35 period. In recent years, the downward trend appears to have continued with landings in 1979 at 61 214 tonnes and in 1980 at 54 178 tonnes.

Historically, the bulk of Canada's supplies of sockeye and pink salmon have been canned. In recent years, however, frozen products are becoming important for these species (Table 3). The reasons for this change 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 BC along with small quantities of specialty products such as pickled and steaked salmon.

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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)

Period or year	Canned	%	Other	%
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
1979	30.3	49.5	30.9	50.5

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

TABLE 4
Trends in real wholesale prices* of
Canadian salmon by species and product type
over the period 1961-76

(annual percentage increase)

Product type	Species				
	Sockeye	Pink	Chum	Coho	Chinook
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, Dept. of Fisheries and Oceans, Vancouver, Nov., 1978.

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

A-III Extended Jurisdiction

The extended jurisdiction established by many fishing countries have not affected the fishing of salmon as greatly as that of other species because salmon have customarily been fished in estuaries and close to shore as they 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 bound for North American and USSR waters. The initial effect occurred in 1977 when Japanese fishermen were excluded from the waters of the USSR 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 60 000 tonnes, down 25% from the 1975 bumper year. The USSR catch, on the other hand, nearly doubled to 131 000 tonnes. In the 1978, 1979, 1980 and 1981 agreements with the USSR, Japan has been compelled to accept a salmon quota of 42 500 tonnes[1]. This agreement was expected to reduce Japan's catch of salmon by 32%, and its catch of the highly valued red salmon by double that percentage. The 1979 agreement set the overall catch quota at the same amount as the previous year, and further restrictions were imposed, such as curtailing the high seas portion of allowable catches to 23 500 tonnes from the 28 000

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1 Industry sources state that actual offshore catches are higher than quotas allocated by the USSR as some salmon destined for North America is taken and not reported.

tonnes allowed in 1978. 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 is uncertain since these salmon originate in Soviet and North American waters. In the medium term a continuation of present catches is projected.

In addition, the International Convention for the High Seas Fisheries of the North Pacific Ocean (INPFC) of which Canada, Japan and the US 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 of fishing salmon destined for North America.

Under treaty arrangements, Canadian and American fishermen share equally the Fraser River sockeye and pink salmon 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. This agreement also provides for joint funding of pink and sockeye enhancement. Salmon fisheries for all species originating elsewhere are at present subject to the domestic management system of each country and no formal consultative mechanisms exist between Canada and the US. At present fishermen from each country intercept fish bound for the other's waters. Estimates suggest that the value of interceptions by US fishermen of Canadian fish exceeds the value of interceptions made by Canadian fishermen of US fish (possibly by ($18 million in 1979). Recent discussions between the two countries is expected to result in agreement on a new management system to cover interceptions, the co-ordination of enhancement programs, management of Fraser River salmon, and development and research on salmon stocks.

The market opportunities for salmon from extended jurisdictions, therefore, are mainly the result of the Japanese becoming major importers of salmon rather than major exporters, creating supply shortages in each of

the main markets. Other effects are the possible emergence of substitute lower priced products, or with more supplies, USSR canned salmon possibly being substituted for that which is not now available from Japan.

A-IV Salmon Enhancement

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

The Canadian program for Pacific salmon calls for a doubling of production over a 30 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 by 19 900 tonnes above the 1977 level of 65 522 tonnes. The additional catch will be distributed 19 050 tonnes to Canadian fishermen and 860 tonnes to American fishermen. About 85% of the funds are allocated to projects that will primarily benefit the commercial and recreational fishing sectors, while the remaining 15% will be directed toward projects aimed at increasing employment, regional development and opportunities for native people.[1] The long term objective is to increase each of the five species of salmon to its maximum potential through techniques such as lake fertilization, transplants, fishways, hatcheries, and spawning channels.

Feasibility studies are in progress 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 Hokkaido Island, with some on northern Honshu Island. Chum salmon is the main species enhanced, although pink and cherry are also important. The Japanese have recently increased their chum salmon production greatly by upgrading their hatchery system and introducing more innovative techniques.

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1 Phase II of the program starting in 1985 is in the planning stages and will depend on the success of Phase I.

> According to one expert on the subject: "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 five years (1981) with predicted returns of about 25 million adults."[1]

On the other hand, the potential for enhancing sockeye and coho runs in Japan has not been encouraging thus far from efforts directed to that end.

Japan also has a co-operative program with the USSR 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 boundary in the Northwest Pacific.

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

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

The major source of enhanced production in the US will be from Alaska, where a $500 million program has begun, 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 toward fishermen and native organizations rather than big business.

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1 Groot, G., An overview of Salmonid 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.

Washington State's enhancement program consists of hatcheries, spawning and rearing channels, holding ponds and pen-rearing, 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 1 million chum salmon by 1991 through restoration of wild runs, 5 million chum per year by 1984 from hatcheries, one-half million hatchery coho per year by 1984 and 1 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 establish populations of coho, chinook and steelhead in a major river system. Full development is expected to result in an annual yield of 640 000 chinook and more than 10 000 steelhead. In this state, private interests have been allowed to build and operate hatcheries. Future production is uncertain.

Salmon ranching is allowed in Oregon, California and Alaska (under "non-profit" conditions). It is not permitted in Canada or in 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 success. Problems 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 growing production of farmed salmon primarily in Norway. The fish are raised in ocean fjords and sea pens. Theoretically, the potential is very good, but some problems have been encountered in rearing.

According to the Norwegian Fish Rearers' Association, production increased from 900 tonnes in 1975 to 3 300 tonnes in 1978. Exports of salmon from Norway (including wild salmon) increased from 1 500 tonnes in 1975 to 3 500 tonnes in 1978. Production in 1980 amounted to 4 100 tonnes.

In addition to salmon, there is farmed production of rainbow trout, sometimes referred to as fjord salmon, which increased from 1 700 tonnes in 1975 to 3 400 tonnes in 1980. This fish is mainly sold domestically (in Norway) and competes with salmon. Of the total salmon exports from Norway in 1978, 2 300 tonnes were fresh while 1 200 tonnes were frozen. Europeans generally prefer fresh salmon to frozen, a factor which gives the Norwegian product a marketing edge over Pacific salmon. Germany, France, Denmark and Sweden were the most important markets for Norwegian salmon in 1978 and 1979. The outlook for salmon production from Norway is for slow but steady growth up to 1982, and perhaps a sharper increase after that. The Norwegian Fish Rearers' Association estimates that by 1985 a possible 15 000 tonnes to 20 000 tonnes could be produced. 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 must be fed with lower valued species such as capelin.

In the UK some very substantial companies have invested in salmon farming, the largest being the Unilever subsidiary, Marine Harvest Ltd. It is interesting to note that Unilever has declared the prospect of a 10 000 tonne actual output as not being unrealistic. Shell, the international oil company, has taken a 50% stake in Gateway West Argyll Ltd., and the research and development facilities of its Chemicals Division could prove invaluable in future expansion, which could include salmon farming. Booker-McConnell, another international British based company, in association with the

Highland Trout Company, is producing both trout and salmon. Other companies involved are Fisons Ltd., Messrs. Fitch Lovell Ltd., Joseph Johnston and Sons Ltd., and Shearwater Fish Farming, a subsidiary of Kraft Foods, US.

European expectations for salmon production are probably overly optimistic but, nonetheless, they do present potential competition for Canadian salmon exporters. Although prices for fresh Norwegian salmon are considerably higher than for frozen Canadian salmon in Europe, the trade estimates that Norwegian prices could be lowered. In addition, reference prices could be applied by the EC on salmon imports.

The effect on total world salmon supply resulting from all the above-noted enhancement programs is difficult to predict. The success of each country in attaining its production goals is a major variable. Further uncertainties are associated with declines in natural 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% annually, so that by 1985 world production could be 14% higher.1

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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 in Canada, no substantial change is predicted in marketing patterns before 1985. Over a longer period, if supplies increase appreciably through enhancement, there is a good potential to increase exports to US and European markets because of the high demand and consumer preference for this salmon.1

B-II Pacific Salmon

To determine the global import potential for Pacific salmon, it is necessary to project trends in exports and consumption in the domestic market, based on factors influencing salmon demand such as population growth, standards of living, and prices of salmon relative to those of substitutes.

Populations in countries that make up the major markets for salmon are expected to increase to 739 million by 1985 (.767% per year). The most rapidly growing markets, in terms of population size, are the most important for Canadian salmon. These include Canada, Australia and New Zealand, Japan, US and France (Table 5).

Standards of living, as measured by per capita disposable incomes, are highest in Switzerland, Sweden, Canada, US 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).

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1 From 1978 to 1980, Atlantic salmon exports from Canada increased from 445 tonnes to 588 tonnes. (Frozen product accounted for 78% of total exports in 1980). Fresh exports - primarily to the US increased by 58% over the three years while frozen exports - mainly to FRG and the US increased by 26%. The increase in exports in 1980 resulted mainly from the larger catches in Canada which doubled from the previous year to attain a level of 2 300 tonnes.

TABLE 5
Population and per capita disposable incomes in the main markets for Canadian Pacific salmon with projections to 1985

	Annual percentage increase		Base year		Projections			
			1977	1976	1981		1985	
	% Pop	% Income	Pop (Mils)	Income (US $)	Pop (Mils)	Income (US $)	Pop (Mils)	Income (US $)
North America								
Canada	1.7	19.7	23.3	7 339	24.2	14 568	26.5	20 341
US	0.9	10.6	216.8	6 974	222.2	10 670	232.2	13 627
Western Europe (EC)								
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
West 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
Western Europe (non-EC)								
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
Pacific								
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. Between 1976 and 1979 the Canadian dollar dropped 15% in terms of US currency, 28% in terms of French francs, 38% in terms of the UK pound sterling and 59% in terms of the Japanese yen (Table 6). An upward movement in the Canadian dollar value relative to other major currencies could seriously retard export sales. Between 1979 and February 1981 the Canadian dollar declined slightly in value relative to the US dollar, the UK pound and the Japanese yen. In terms of German marks and French francs the Canadian dollar has gained recently.

TABLE 6

Exchange rates for the four main salmon importing countries

	France (Franc)	Japan (Yen)	UK (Pound)	US (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	26.535	.53198	246.40	117.151
1981(Feb.)	24.400	.58970	280.03	119.570

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 prices of substitute products. This demand analysis forecasts real price changes for Canadian Pacific salmon products with an enhancement program and without enhancement. The results show price increases under both conditions for canned, fresh and frozen salmon, indicating the 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 14 000 tonnes in the late 1960s to more than 30 000 tonnes in the mid 1970s. This trade advanced sharply upward in 1977 and 1978 when Japan began importing large quantities of salmon. No exports of frozen salmon have been recorded in past years from the USSR[2] (Table 7). Since 1978, European countries have recorded increasing exports, mainly of Farmed Atlantic Salmon.

TABLE 7
World exports of frozen salmon by exporting countries, 1967-1979
(000 tonnes)

Year	Canada	United States	Japan	Europe	Total	Net Exports[3]
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	20.9
1976	12.4	17.4	2.3	--	32.1	26.5
1977	16.4	29.7	0.5	--	46.6	--
1978	23.3	55.4	0.2	2.7	81.6	--
1979	21.2	63.6	1.4	5.0	91.2	--

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

* less than 50 tonnes

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1 D.J. Devoretz, Demand for Salmon Products, Department of Economic and Commerce, Simon Fraser University, Vancouver, Jan. 24, 1979 (Unpublished).

2 In 1980 frozen salmon exports were recorded from the USSR to Japan.

3 Exports between producing countries have been deducted from total.

Traditionally the main importing countries have been France, the UK, Sweden and Japan (Table 8). Denmark, West Germany, the US and Italy have also been significant importers of frozen salmon.

TABLE 8

World imports of frozen salmon by importing countries, 1967-1978[1]

(000 tonnes)

Year	Japan	France	UK	Sweden	Other2	Total
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	6.8	12.0	3.4	3.9	8.0	34.1
1976	3.7	10.2	3.2	3.3	9.8	30.2
1977	19.3	12.1	--	--	--	--
1978	49.7	12.1	4.5	4.0	12.0	82.3
1979	54.6	14.3	4.6	4.6	13.8	91.9

Sources: 1. FAO, Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.

2. Canadian Department of Industry, Trade and Commerce.

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1 For the years 1967 to 1974 net imports have been derived by subtracting each country's total frozen exports from its frozen imports.

2 Includes some quantities of fresh salmon.

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

Total world exports of canned Pacific salmon show a slightly declining trend since 1968 when the total quantity exported reached a 10 year high of 63 400 tonnes. The 1979 trade statistics show total exports at 40 200 tonnes (Table 9). Exports from Japan have dropped sharply while more are recorded from the US and USSR.

TABLE 9

World exports of canned Pacific salmon by exporting countries

	Canada		Japan		US		Russia		Total	Other
YEAR	000 tonnes	%	000 tonnes	%	000 tonnes	%	000 tonnes	%	000 tonnes	
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	
1977	13.0	--	4.2	--	9.7	--	--	--	--	
1978	11.4	31.3	4.1	11.3	14.8	40.7	4.8	13.2	36.4	1.3
1979	9.7	24.1	0.2	0.5	22.7	56.5	6.0	14.9	40.2	1.6

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

Traditionally, the UK has been the largest importer of canned salmon accounting for 56.3% of total world imports in the decade from 1967 to 1976. Nonetheless, UK imports have declined significantly since the late 1960s when more than 40 000 tonnes were purchased. Other significant import markets have been Australia, Belgium/Luxembourg, the Netherlands, France and Italy, but each of these has accounted for less than 6 000 tonnes (Table 10).

TABLE 10

World imports of canned Pacific salmon by importing countries

	United Kingdom		Australia		Belgium & Luxembourg		Nether-lands		Fr.	It.	New Zeal.	US		Other		Total
	000		000		000		000		000					000		000
Year	tonnes	%	tonnes	%	tonnes	%	tonnes	%	tonnes				%	tonnes	%	tonnes
1967	40.1	67.6	4.7	7.9	3.3	5.6	2.7	4.6	1.2	0.7	0.7	0.2	0.3	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	0.4	0.7	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	0.3	0.7	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	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	0.4	0.9	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	0.3	0.9	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	0.3	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	0.7	0.2	0.6	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	0.9	--	0.5	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	--	0.8	0.6	1.5	6.3	15.7	40.2
1977	--	--	--	--	3.5	--	--	--	--	--	--	--	--	--	--	--
1978	13.9	40.9	4.5	13.2	3.1	9.1	5.0	14.7	3.1	0.3	0.9	0.1	0.3	3.1	9.1	34.0
1979	15.1	44.0	4.2	12.2	3.2	9.3	4.6	13.4	3.5	0.2	1.0	0.2	0.6	2.3	6.7	34.3

Source: FAO, Yearbook of Fisheries Statistics - Fisheries Commodities, Rome, Italy, 1967-1976.

C. FUTURE POTENTIAL FOR CANADIAN SALMON

Demand projections for the major world markets, including Canada, indicate that by 1985 they should be able to absorb 107 000 tonnes of Canadian salmon in round weight equivalent. Since potential production will be at 87 000 tonnes, the shortfall may result in higher prices. Major opportunities for increasing sales of Canadian canned salmon may arise in the UK, Belgium/Luxembourg, the Netherlands, Australia and New Zealand. There may be opportunities for increased sales of frozen salmon to France, Sweden, Denmark, the Netherlands and Finland. In the paragraphs that follow, market prospects are examined by region and by individual country.

C-I Western Hemisphere

The primary western markets for Pacific salmon are in Canada and US. Other markets, which have demonstrated some potential for sales of salmon products, are Argentina, Chile, Colombia, 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 good potential for increasing sales.

C-I-1 The Domestic Market

Historically, Canada has been a very large market, especially for canned salmon but also for frozen salmon in some years. From 1968 to 1979, domestic consumption of canned salmon ranged from a low of 12 200 tonnes to a high of 17 900 tonnes, with an annual average of 15 800 tonnes. Exports ranged from 5 700 tonnes to 18 100 tonnes, leaving about 56% of the annual production (plus imports) for domestic consumption. Canned salmon exports and production have declined in the 1970s, while canned imports, primarily from the US, have increased slightly. Per capita consumption (at 0.73 kilograms in 1978) is at nearly the same level as it was a decade ago (Table 11). Consumption declined in 1979 and 1980 because of reductions in domestic catches.

TABLE 11

Domestic disappearance of Pacific canned salmon 1968-1979

	Production	Exports	Imports	Consumption	Per capita
		(tonnes)			(kilograms)
1968	38 036.6	18 120.9	--	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	.830
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	24 545.0	11 415.9	2 830.2	17 147.1	.730
1979	20 797.8	9 727.0	2 973.0	17 143.8	.723

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 toward a decrease or increase in consumption of either canned sockeye or pink salmon, but there is some indication of declines in consumption of canned coho and chum. In the short supply years of 1979 and 1980 Canadian dealers were importing more canned salmon from Alaska (one pound talls) for sale in Canada. Retailers expect an increase in the sale of canned quarters at the expense of halves and talls, reflecting the increasing number of smaller families in Canada. A recent study of the domestic market determined that consumption of canned salmon is highest in Manitoba and Saskatchewan, followed by Ontario and Alberta. On a national basis canned tuna consumption is now equal to that of canned salmon[1] but in the future canned salmon is expected to again surpass tuna because of increased availability of salmon and rising prices of tuna.

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1 See: Operational Management Incorporated (OMI), The Canadian Fish and Seafood Industry, Marketing Services Branch, Dept. of Fisheries and Oceans, Ottawa, 1980.

For frozen salmon, domestic consumption has remained at less than 7 000 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 decade 1969 to 1978, domestic frozen salmon consumption consisted of 25% coho, 26% chinook, 13% pink, and 36% chum salmon.

Trends that are evident in the US are also known to exist in the Canadian 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, but commercial packaging is increasing sales of frozen salmon steaks. 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 frozen salmon, 1968-1978[1]

	Production	Exports	Imports	Consumption	Per capita (kilograms)
1968	16 014	10 143	643	2 951	0.14
1969	11 616	12 923	870	1 983	0.09
1970	17 218	10 557	1 358	3 966	0.19
1971	11 827	13 456	1 630	2 822	0.13
1972	21 792	17 589	1 242	1 283	0.06
1973	22 366	21 127	1 572	2 487	0.11
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	0.13
1977	16 640	15 843	3 578	5 588	0.24
1978	23 498	22 952	3 650	2 710	0.11
1979	18 008	21 174	2 926	6 628	0.28

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

[1] Includes Atlantic salmon. In 1980 consumption of frozen Atlantic salmon is estimated to be 1 342 tonees - about double the 1979 volume.

Atlantic salmon consumption in Canada has varied considerably from year to year according to quantities available. In 1980 consumption is estimated to have increased to 1 342 tonnes (1 610 tonnes round weight) from 622 tonnes in 1979. Domestic consumption of Atlantic salmon has historically occurred mainly in Eastern Canada - where the cities of Montreal and Toronto have the largest concentration of consumers. Consumption in Western Canada has been very low due to the relative abundance of Pacific salmon. Atlantic salmon in Canada is consumed primarily in the high class restaurant trade (for large salmon of good quality) and the supermarket trade for smaller salmon. Poorer quality salmon is generally frozen and used for steaking.

Fish dealers in the larger centres of Eastern Canada report that availability of Atlantic salmon is the major obstacle to marketing. Seldom is it possible to obtain adequate quantities to fill orders and supermarket promotion etc., are generally not possible. Smokers in the large centres do not use Atlantic salmon because of the lack of supplies of good quality fish. For smoking, larger fish is preferred (over 11 pounds) and glazing is desirable. More Atlantic salmon would be used for smoking if it were suitable because "scotch" smoked salmon is the most popular in the world. Atlantic salmon has traditionally been used for this product but presently coho and other salmon are substituted.

It is apparent that there is a good potential to increase Atlantic salmon consumption in Canada.

The projection for the domestic market is that by 1985 canned salmon consumption will be 20 560 tonnes, based on slightly increasing per capita consumption rates. In respect to frozen salmon (Pacific and Atlantic) an increase is projected to result in total consumption by 1985 of 9 932 tonnes. Cured consumption may expand from 521 tonnes in 1979 to 900 tonnes in 1985.

C-I-2 The United States Market

Per capita consumption of salmon in the US has shown a long-term decline due to reduced total supply, increasing exports and increasing populations. For canned salmon, per capita consumption during the 1960s was 0.8 pounds, declining to 0.5 pounds in the 1970s. For frozen and cured products a more level trend is evident although wider fluctuations are apparent from year to year.

There has been a strong substitutional relationship in the market between the demand for canned salmon and that for canned tuna. Per capita consumption of canned tuna increased from an average of 2.2 pounds in the 1960s to 2.9 pounds in the 1970s. This increasing trend began to subside in 1979 after per capita consumption of 3.3 pounds was recorded - the same as in the previous year. It is probable that in future years consumption of canned tuna may not increase as rapidly in the past because of shortages of supply from domestic and foreign sources.

The market for frozen salmon in the US is largely related to the demand for smoked and cured products. In large cities such as New York and Chicago, salmon smokers bring frozen salmon and mild cured salmon in from the west coast and process it into products such as "Nova Scotia" smoked salmon, Scotch-style smoked salmon sides and lox sides. Lox is produced from mild cured salmon, which is imported in 250 pound casks. Red spring salmon from the Pacific is most often used but certain producers call specifically for Atlantic salmon, and some white spring and coho salmon is used. Some smokers said they would use much more Atlantic salmon if more was available. Sockeye and pink salmon are never used for smoking because of their small size, and the flesh of pink salmon is often too soft.

The high consumption of smoked salmon in New York reflects the large Jewish and Scandinavian populations. Smoked salmon consumption is reported to be increasing, as people of other ethnic origins acquire a taste for it. Consumption could be higher if prices were lower, but competition supplies keeps prices high. Some smoked Atlantic salmon is brought in from Scotland, although some of the raw material used for producing the product comes from Canada.

Fresh and frozen salmon for the restaurant trade is consumed throughout the larger cities but not on a large scale. In New York City, fresh Pacific salmon is most often purchased through Seattle brokers, although it may come from either the northwestern states, BC or Alaska, depending on availability and price. Salmon could be a larger item in restaurants but it is thought to be too expensive when compared to cod and shellfish. Atlantic salmon is a larger item for the specialty restaurant trade - mainly French and Italian.

Consumption of frozen salmon steaks from retail supermarkets may show an increasing trend with the introduction of vacuum packages. These packages extend the shelf life of frozen fish considerably and are likely to be in demand as a convenience item.

By 1985 it is projected that the US will be consuming 53 000 tonnes of canned salmon and 18 000 tonnes of frozen salmon per year (Table 13).

TABLE 13
US salmon consumption, 1977-1979 and 1985
(000 tonnes, product weight)

	1977	1978	1979	1985[1]
Canned	49	59	50	53
Frozen and cured	9	17	17	18
	58	76	67	71

[1] Based on average per capita consumption figures in five most recent years and population projections.

Source: Fisheries of the United States, US Dept. of Commerce, National Marine Fisheries Service, (NMFS) Washington, D.C., and author's estimates.

In recent years, US processors have exported a considerably larger proportion of their salmon production, both frozen and canned.

Frozen salmon exports have expanded in response to sharply increased prices offered by the Japanese. Japan's salmon import requirement increased dramatically after the extension of fishing jurisdiction by the USSR and the US reduced Japanese high-seas catches. Japanese salmon imports (in total) increased from 3 700 tonnes in 1975 to 49 700 tonnes in 1978 and 55 000 tonnes in 1979. It is estimated that Japan's imports may level off at 50 000 tonnes of salmon by 1985 of which the US will supply 42 000 tonnes.* In 1979 exports from the US to Japan amounted to 43 218 tonnes compared to 15 270 tonnes in 1977.

Total frozen salmon exports from the US were 65 438 tonnes in 1979 compared to 31 680 tonnes in 1978. Quantities exported to France and Sweden were also higher in 1979 than during the previous years (Table 14). The market for frozen salmon was volatile in 1979 and turned out to be unprofitable for processors due to the very high prices paid for raw fish and declining selling prices later in the year. Processors froze too much salmon, anticipating better demand, and this contributed to a decline in prices.

Markets for canned salmon improved steadily in 1979 and early 1980 with prices increasing for both pink and sockeye. As a result more of the 1980 catch was diverted to canning, which caused prices to increase somewhat for the frozen product.

Canned salmon exports from the US have increased sharply in recent years as a result of less competition from Japan. The UK, Australia and Canada have accounted for most of the increase. Canada is importing more salmon because of supply shortages caused by poor catches. Canadian canners are finding it more profitable to process quarter pound and half pound cans and import one pound tall cans from Alaska.

By 1985 it is anticipated that US canned salmon exports will attain a level at least as high as that of 1979 as traders move to permanently fill the void created in export markets by the near phase-out of the Japanese canned salmon industry. The extremely large Alaska salmon runs in 1979 and 1980 resulted in unusually high production, which caused exports to reach a very high level.

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* See section C-IV-2 for further explanation.

TABLE 14

US exports of canned salmon

(000 tonnes, product weight)

	1977	1978	1979	1985
Canada	1.0	3.0	4.0	4.0
UK	4.0	4.0	8.0	9.0
Netherlands	1.0	2.0	2.0	2.0
Belgium	0.5	0.5	1.0	1.0
Australia	0.6	2.0	3.0	3.0
Japan	0.3	0.6	1.0	2.0
Other	0.8	1.0	1.0	1.0
	8.2	13.1	20.0	22.0

Source: US Department of Commerce, Bureau of the Census and author's estimates.

Projections, indicate that frozen salmon exports will stabilize at 64 000 tonnes to 1985 (Table 15). Larger quantities are not expected to materialize because of impending competition from domestic (US) demands and a levelling in demand for imported salmon in Japan. More competition is also forthcoming in Europe from cultured Atlantic salmon.

TABLE 15

US exports of frozen salmon

(000 tonnes product weight)

	1977	1978	1979	1985
Canada	3.0	2.0	3.0	3.0
Sweden	2.0	2.0	3.0	3.0
Denmark	0.8	0.4	0.6	1.0
UK	2.0	3.0	3.0	3.0
Netherlands	0.5	0.8	0.8	1.0
Belgium	0.9	0.8	1.0	1.0
France	6.0	6.0	8.0	8.0
FRG	0.8	1.0	1.0	1.0
Japan	15.0	41.0	43.0	42.0
Other	0.7	1.0	1.0	1.0
Total	31.7	58.0	64.4	64.0

Source: IBID.

Salmon landings in the US have increased progressively each year since 1975. The 1979 catch of 243 137 tonnes was a post-World War II record - up by one third from the previous year. The 1980 catch was expected to surpass that of 1979 but preliminary figures indicate that it was nearly the same. The higher Alaskan production was dominated by catches from Bristol Bay, where the run in 1979 of 40.3 million fish was more than double the 1978 run and 2.2 times the 20 year average run of 18.5 million fish.

The improvement in Alaskan salmon runs is being attributed to warmer water temperatures and better environmental conditions, such as milder winters causing less freeze out in streams. The cutback in Japan's high-seas salmon fishery has also had an effect - but even in the peak year the Japanese only caught 7 million fish bound for Bristol Bay.

For the future, biologists in Alaska predict good runs, especially in cycle years. For 1981, the Bristol Bay fishery will be two thirds as strong while for 1982, 83' and 84' lower returns are expected. The 1985 cycle year should be as strong as 1980. Pink salmon returns have also been high in recent years in Bristol Bay and other coastal areas and this trend is expected to continue. Pinks have a two year cycle but the various fisheries should balance to produce runs of about 50 million fish per year.

These predictions will of course be affected positively or negatively by the continuation or otherwise of current environmental factors, and by high-seas catch rates.

Salmon enhancement programs currently under way in the western US[1] are aimed at a large increase in the harvest. The objective (in Alaska) is to expand production to historic high levels of 100 million fish by 1990. With other programs in Washington and Oregon, supplies are projected to reach a level ranging from 183 000 to 221 000 tonnes by 1985 (Table 16).

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1 There are hatchery programs under way for the production of Atlantic salmon in Connecticut and Vermont but commercial volumes have not materialized as yet.

TABLE 16

US salmon landings 1977-79 and 1985

(000 tonnes, round weight)

	1977	1978	1979	Range 1985
Atlantic coast	0	0	0	0
Pacific coast	27	25	31	33-41
Alaska	125	158	212	150-180
Total	152	183	243	183-221

Source: Fisheries of the United States, OP CIT., and author's estimates.

If the anticipated markets materialize and the 1985 salmon landings in the US fall short of the record set in 1979 there is a potential shortfall of 5 000 tonnes product weight or 6 000 tonnes of round weight (Table 17). This scenario would require that domestic landings be utilized for canning and that the shortfall be incurred in frozen products.

TABLE 17

US salmon balance, 1979 and 1985

(000 tonnes, product weight)

	Demand				Domestic production		Imports	
	Domestic		Export				Actual	Potential
	1979	1985	1979	1985	1979	1985	1979	1985
Canned	49	53	21	22	70	75	0	0
Other1	17	18	65	64	82	76	2	6
Total	66	71	86	86	152	151	2	6

Source: IBID.

1 Product assumed to be frozen dressed salmon - to convert to round use a factor of 1.20

Imports of salmon products to the US have been negligible in the past years, except for fresh and frozen salmon from Canada which have been from 2 000 to 3 000 tonnes. Since Canada is the only country that could supply the shortfall that might be experienced in the US, the potential sale of 5 700 tonnes is projected from Canada by 1985 (Table 18). This could only come about if the Japanese market stabilizes at current levels.

TABLE 18

US salmon imports by country

(000 tonnes, product weight)

	Canned		Fresh/frozen		Cured	
	1979	1985	1979	1985	1979	1985
Canada	0.2	0.2	2.0	5.3	0.1	0.4
UK	0	0	--	0	0.046	0
Other	0	0	0	0	0	0
Total	0.2	0.2	2.0	5.3*	0.2	0.4

* Includes 300 tonnes of Atlantic salmon - see Appendix I, Table 17.

Source: US Imports for Consumption, Bureau of the Census and author's estimates.

C-II Western Europe (EC)

Western European countries of the EC are significant importers of Canadian Pacific salmon. For canned salmon, the main markets are the UK, Belgium/Luxembourg, the Netherlands and Italy, while for frozen salmon the major markets are France, FRG, Denmark, Italy, the Netherlands and Belgium/Luxembourg.

C-II-1 United Kingdom

The UK has traditionally been a large market for canned red and pink salmon. Of the canned salmon imported into the UK from Canada in 1980, sockeye amounted to about 55%, pink 35% and coho 5%.

The UK 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 improved economic conditions brought about by developing North Sea oil resources. Prices for canned salmon in 1979 have increased by 25%. Potential is apparent for lower priced canned salmon along with the more popular sockeye products. Japan was the largest supplier, but since 1977 has not supplied any canned salmon to the UK leaving a large gap in the market. It has been suggested that a brand identification of BC salmon, for example a dogwood emblem, might create a good impetus to sales, but this may not be practical until production increases.

The UK has also been a steady importer of frozen salmon, with total imports averaging 3 800 tonnes from 1967 to 1976 (Table 8). Canadian exports amounted to 748 tonnes in 1976, increasing to 902 tonnes by 1978 and 1 041 tonnes in 1979. More than 50% of these exports were chum salmon to be used for further processing into smoked products.

TABLE 19

Imports of canned salmon to the United Kingdom by country of origin

(000 Tonnes)

Year	CANADA		JAPAN		US		USSR		Total
	t	%	t	%	t	%	t	%	t
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	0.7	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	--	--	--	9.7	--	--	--	--
1978	5.4	38.8	2.6	18.7	4.8	34.5	1.1	7.9	13.9
1979	7.4	49.0	--	--	5.4	35.8	2.3	15.2	15.1

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

Quality must be maintained for the British 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. Both the domestic and export trades are growing, due to promotional marketing activities and new product packaging design. Pre-packaging now makes it more acceptable to retailers. As well, a new middle-income market has been opened up by offering less expensive smoked salmon products.

Even though frozen salmon enjoys duty free entry into the UK, the price is considered too high. Pacific salmon prices are lower than those of Atlantic salmon. Traditionally, Canadian salmon is considered to be of better quality than other salmon.

The projection of salmon sales on the UK market by 1985 is 7 100 tonnes for canned and 3 100 tonnes for frozen. This is thought to be a reasonable projection in view of the absence of competition from Japan. However, the US and the USSR may increase exports to the UK because of their greater raw fish supplies which were previously taken by Japan. In addition, increasing competition in the market for frozen salmon may be generated by production of cultured Atlantic salmon in Europe (see Section A-IV).

C-II-2 France

France was the largest export customer for frozen salmon until 1978, when Japan began importing larger quantities. The French market has been mainly for coho (75%), but also for chinook and recently Atlantic salmon. Frozen salmon imports increased sharply from 1974 to 1975 and remained at more than 12 000 tonnes to 1977. In 1977 Canada supplied 4 700 tonnes (39%) of the total. The 1979 statistics show an increase in French total imports to 19 063 tonnes of which Canada supplied 32%.

With no indigenous production, France relies generally on imports from the US and Canada for its smoking trade and on the UK, Ireland and Norway for fresh products. Norway is, however, seen as a potential supplier to the smoking trade in the medium to long term with farmed salmon. Canada supplied 5 800 tonnes of frozen salmon to France in 1979, accounting for 40%

of total frozen imports. Comparative prices of salmon products in France (Min Rungis, near Paris) in March 1979 were as follows:

		Price (in French Francs per kilogram)		
	Product	Low	High	Avg.
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

Source: Worldwide Fisheries Marketing Study - France, Phase I, Dept. of Fisheries and Oceans, Ottawa, 1979.

Canadian (BC) salmon is appreciated in France for its quality, particularly for smoking. Demand for this product is likely to increase over the medium term. The imposition of higher tariffs on Canadian salmon (demanded by EC salmon producers) may, however, have an effect on Canada's competitive position. The demand for canned salmon in France increased substantially between 1976 and 1977 with the USSR dropping from its dominant position as supplier of 82% to 68%, and Japan from 12% to 6%. Canada increased its share from 5% to 18%. Years ago, it is reported, Canada was the main supplier of canned salmon to France. This situation changed when the USSR and Japan came in with a more constant supply. Now, with smaller supplies available from Japan, Canada is again increasing her share of the market. In 1979 Canada supplied 418 tonnes of canned salmon to France - about 12% of the total, but this share should increase with greater supplies available from Canada. Canned salmon imports to France have increased substantially in the past few years (Table 20).

TABLE 20

Imports of canned salmon into France by country of origin

(000 Tonnes)

Year	Canada 000 tonnes	Japan 000 tonnes	USSR 000 tonnes	Other 000 tonnes	Total 000 tonnes
1967	0.7	0.5	--	--	1.2
1968	0.3	1.4	--	--	1.7
1969	0.2	1.0	--	--	1.2
1970	0.1	0.9	--	--	1.0
1971	0.1	1.3	0.6	--	2.0
1972	0.3	1.7	0.8	--	2.8
1973	--	0.3	1.2	--	1.5
1974	0.3	0.3	0.1	--	0.7
1975	0.3	0.5	0.1	--	0.9
1976	0.2	0.2	1.3	--	1.5
1977	0.6	--	--	--	--
1978	0.2	0	2.4	0.5	3.1
1979	0.5	0	2.5	0.5	3.5

Sources: 1. FAO, Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-1976.

2. Canadian Department of Industry, Trade and Commerce.

There are few import barriers against 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. High prices are not a deterrent to "eating out", so the market for restaurant consumption of salmon is large. It is felt that the demand for higher-priced luxury products will increase in the future.

With the current trend in France toward fewer middlemen, products can be imported by supermarket chains, or on their behalf by central buying units, for direct sale to consumers. Wholesale fishmongers and agents/representatives number in the thousands.

Projections to 1985 indicate there will be a market for 7 200 tonnes of Canadian frozen salmon and 759 tonnes of canned salmon.

C-II-3 Denmark

Denmark is a large and expanding market for salmon products, with total imports of almost 5 000 tonnes in 1979, up from 4 200 tonnes in 1978. Most of the fresh salmon imported (800 tonnes) was farmed Atlantic salmon from Norway. Canada was the main supplier of frozen salmon in 1979 selling nearly 1 300 tonnes, up from 800 tonnes in 1976. (In 1980 this quantity increased to 1 358 tonnes). The major competing supplier of Pacific salmon is the US, while Greenland and Norway supply most of the frozen Atlantic salmon (1 285 tonnes in 1979). Danish consumers prefer Atlantic salmon, but 80% of salmon consumed is of Pacific varieties, mainly chum salmon, because Atlantic salmon is more expensive. Canned salmon exports from Canada to Denmark are increased, amounting to 63 tonnes in 1980, nearly double the 1979 quantity.

Denmark re-exports much of the salmon imported - nearly 67% in 1979, with about 2 000 tonnes of fresh and frozen salmon exported to 29 countries and 1 334 tonnes of smoked salmon to 40 countries in that year.

It is projected that by 1985 Canada will export 1 600 tonnes of frozen salmon and 75 tonnes of canned salmon to Denmark. For Atlantic salmon sales of 25 tonnes are forecast.

C-11-4 West Germany

Exports of Canadian frozen salmon to FRG were close to 1000 tonnes from 1976 to 1979, increasing to 1 250 tonnes in 1980. Chum salmon has been the most important item (57% in 1980) followed by spring and coho. This country is Canada's largest export market for frozen Atlantic salmon. The FRG imports an average of 4 000 to 4 500 tonnes of salmon per year. In 1979 the US supplied 30%, Norway 17% and Denmark 6 %. American exporters increased their share of the market in 1979 compared to earlier years.

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 five or six years. Species and sizes used in the smoking trade are, in order of preference:

		Pounds:
Troll salmon:		
	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 (one kilogram with head, gutted at 50 Nkr - C$11.20), but the German importer expects a substantial drop in prices when certain bottlenecks in aquaculture technology have been overcome. At that time, a Norwegian production of 15 000 tonnes at a substantial price decrease is thought possible.

One effort in which Canadian suppliers have been singularly unsuccessful is the attempt to introduce canned salmon as a replacement for canned tuna, (sales of which recently have amounted to 12 000 tonnes) into the FRG market. A massive educational campaign is required if German consumers are ever to 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-priced island in the world fish market". It believes that the German consumer has for generations assigned a certain price relationship between fish and competing food products, and is not willing to change despite the shift in the cost structure of fish (unit cost increasing) when compared to other food products (costs stable or even decreasing). As a result, price elasticity for all but luxury-type fish products is high, and consumption 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 as to what extent market reactions of the consumer are subject to the manipulation of a highly concentrated industry.

The projection to 1985 for the West German market to 1985 is for Canadian exports of 1 775 tonnes of frozen salmon, 25 tonnes of canned salmon, and 50 tonnes of smoked and specialty salmon products. These projections are perhaps optimistic, depending on Norway's future success in farming salmon.

C-II-5 Italy

Consumption and imports of salmon by Italy increased in recent years, particularly in 1979 when total imports of salmon more than doubled from the previous year from 1 105 tonnes to 2 376 tonnes. Frozen salmon comes mostly from Canada and the US, while fresh chilled salmon originates mainly in Denmark. Much of this is smoked in Italy to the Italian consumer preference. Italians prefer large (three to five kilograms) salmon, heavy-smoked sides, dark red, and only lightly salted. Demand has been continuous throughout the year, although small family-size gift packs (two to three kilograms) are popular at Christmas.

Imports of smoked salmon come mostly from France, the Netherlands, and Denmark with small quantities also from the UK (some 200 tonnes in 1979). European smoking and packaging methods are preferred.

Canned salmon is imported from Canada (68% in 1979), the USSR, US and European countries. Although frozen salmon imports from Canada declined substantially in 1980 from 1979 (because of limited Canadian supply) canned imports maintained the previous year's level of 500 tonnes.

By 1985 it is projected that Italy could be importing 1 000 tonnes of frozen salmon, and 600 tonnes of canned salmon from Canada in the light of recent increases in consumption.

C-II-6 The Netherlands

This country has traditionally been a substantial importer of canned salmon. Total imports from 1976 to 1978 averaged 4 300 tonnes, compared to an average of only 2 300 tonnes in the five years previous to 1976. Japan was once the largest supplier of canned salmon, followed by the US. Most of the imports are re-exported to other EC countries.

Prior to 1977, Canada was not a large supplier to the market, but in 1977 and 1978 Canada's exports increased to 1 100 tonnes or 22% of total supplies (Table 21).

TABLE 21

Imports of canned salmon to the Netherlands by country of origin.

	Canada		Japan		US		Other	Total
	000		000		000		000	000
Year	tonnes	%	tonnes	%	tonnes	%	tonnes	tonnes
1967	0.7	25.9	1.3	48.1	0.7	25.9	--	2.7
1968	0.5	20.8	1.4	58.3	0.5	20.8	--	2.4
1969	0.2	8.3	1.4	58.3	0.8	33.3	--	2.4
1970	--	--	1.8	69.2	0.8	30.8	--	2.6
1971	--	--	1.9	67.9	0.9	32.1	--	2.8
1972	--	--	2.4	80.0	0.6	20.0	--	3.0
1973	--	--	1.0	66.7	0.5	33.3	--	1.5
1974	--	--	1.2	85.7	0.2	14.3	--	1.4
1975	0.2	7.1	1.8	64.3	0.8	28.6	--	2.8
1976	0.1	2.9	2.3	65.7	1.1	31.4	--	3.5
1977	0.9	23.1	--	--	--	--	--	3.9
1978	1.1	22.4	0.4	8.0	1.9	38.0	1.5	5.0
1979	0.8	17.4	0.3	6.5	2.5	54.3	1.0	4.6

Sources: 1. FAO, 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 1 000 tonnes from 1976 to 1978. Canada supplied an annual average of 23%, but in 1980 Canada's sales of frozen salmon to this country increased to 552 tonnes.

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.

Projections indicate that the Netherlands will import 700 tonnes of frozen and 1 000 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 3 900 tonnes in the years 1976 and 1977, and showing a slight increase since then. Japan was a large supplier to the market before 1977, averaging 34% of the supplies from 1967 to 1976.

Canada's share of the imports climbed to 54% in 1977 from the previous level of 28% (Table 22). The main product exported from Canada to this market is canned pink salmon, amounting to 77% in 1978. In 1979 and 1980 sales of canned salmon from Canada declined as a result of supply shortages.

Frozen salmon imports to this market were nearly 2 000 tonnes in 1976 and 1977, and Canada's exports increased between 1976 and 1977 to 565 tonnes. In 1980, 555 tonnes were recorded, most of it coho but also some red chinook, chum and sockeye. Of the fresh and frozen salmon imported, some is used for smoking and curing, mostly for domestic use.

The market projections for Belgium and Luxembourg indicate imports of frozen Canadian salmon at 600 tonnes, and canned at 2 000 tonnes by 1985.

TABLE 22

Imports of canned salmon to Belgium and Luxembourg by country of origin

	Canada		Japan		USA		USSR		Other	Total
Year	000 tonnes	%	000 tonnes	%	000 tonnes	%	000 tonnes	%	000 tonnes	000 tonnes
1967	2.3	69.7	0.8	24.2	0.2	6.1	--	--	--	3.3
1968	1.7	68.0	0.8	32.0	--	--	--	--	--	2.5
1969	1.2	37.5	1.5	46.9	0.5	15.6	--	--	--	3.2
1970	.6	33.3	.9	50.0	0.3	16.7	--	--	--	1.8
1971	1.3	39.4	1.4	42.4	0.1	3.0	0.5	15.2	--	3.3
1972	1.0	35.7	1.1	39.3	--	--	0.7	25.0	--	2.8
1973	1.7	58.6	0.4	13.8	0.1	3.5	0.7	24.1	--	2.9
1974	1.1	50.0	0.5	22.7	0.2	9.1	0.4	18.2	--	2.2
1975	1.0	35.7	0.9	32.1	0.5	17.9	0.4	14.3	--	2.8
1976	1.0	27.8	1.2	33.3	0.6	16.7	0.8	22.2	--	3.6
1977	1.9	54.3	--	--	--	--	--	--	--	3.5
1978	1.8	58.1	0.1	3.2	0.9	29.0	--	--	0.3	3.1
1979	1.5	46.9	--	--	1.5	46.9	--	--	0.2	3.2

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

C-III Western Europe (non-EC)

Among non-EC Western European countries, the largest importing nations appear to be 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, more than 1 600 tonnes of frozen salmon (mainly chum) were exported from Canada to Sweden, increasing to nearly 2 500 tonnes in 1979. The US and Canada are the largest suppliers of salmon for the Swedish market. Chum is the most significant 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 kilogram versus 18 kr. in March 1979). Smoked salmon production from fresh salmon retailed for 207 kr. per kilogram or C$25 per pound in Stockholm, while smoked Canadian salmon was selling for half this price. It is said that there is increasing competition in Sweden from Norwegian 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.

Projections indicate the Swedish market can absorb 2 750 tonnes of Canadian frozen salmon, 10 tonnes of canned salmon and 25 tonnes of smoked salmon by 1985.

C-III-2 Other Western European Countries (non-EC)

Finland, with a population of only 4.7 million, is not a large market for salmon. Finland's salmon landings from the Baltic were 802 tonnes in 1977. There is a small import requirement for salmon fillets from Canada, worth C$250 000 in 1977, and there is interest in additional supplies. Frozen salmon exports from Canada to Finland declined from 24 tonnes in 1978 to 14 tonnes in 1980. Standards of living in Finland are in the mid-range, higher than Britain, Italy or the USSR, indicating that higher priced products such as salmon would be in demand.

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

Small quantities of Canadian salmon have been exported to Norway and Switzerland. Norway has a farmed salmon production in the order of 4 000 tonnes (1980) and a wild harvest of nearly 1 000 tonnes, which largely satisfies its own requirements, with supplies left over for export 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. Silverbright chum is popular because of its pale red flesh, and is sold in frozen or smoked form. Smoked salmon is sold sliced in 100 gram packages or whole sides. The tourist trade offers potential for restaurant consumption, with nearly 40 million visitors to Spain each year. Potential sales are hampered somewhat by the tariff of 15% and tax of 8% on frozen salmon entering Spain. Competition is increasing from salmon originating in Norway, Ireland and Scotland.

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 a shortfall in domestic catches caused by the increase in fuel costs and institution of the 200-mile limits by major fishing nations and the pending entry of Portugal into the EC.

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 share of the fish import market of Greece.

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 volumes consumed are small, these markets offer continuing sales prospects. Some opportunities for selling 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 exist 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 4 300 tonnes in the decade from 1967 to 1976. During this period Japan supplied most of the market, an average of 3 500 tonnes or 81%. Imports were also recorded from Canada, the US and the USSR (Table 23). This market is expected to remain very strong for canned salmon imports, especially since Japan will not be a significant supplier in future years.

In the fiscal year 1977/78 Australia imported 6 726 tonnes of canned salmon. Canada's exports to Australia have not expanded in recent years because of declining production in BC. By 1985, Canada could supply considerably greater quantities, perhaps as much as 3 000 tonnes. For frozen salmon a projection of 100 tonnes is forecast pending the removal of a ban on imports.

TABLE 23

Imports of canned salmon to Australia by country of origin

(000 Tonnes)

Year	Japan	Canada	USA	USSR	Other	Total1
1967	3.1	1.0	0.2	0.4	--	4.7
1968	3.6	0.4	0.1	0.1	--	4.2
1969	4.3	0.3	0.2	0.1	--	4.9
1970	2.5	0.1	0.2	0.1	--	2.9
1971	4.7	0.1	0.3	--	--	5.1
1972	5.2	0.2	0.3	--	--	3.7
1973	3.2	0.1	0.4	--	--	3.7
1974	2.4	1.2	0.5	--	--	4.1
1975	2.3	0.1	0.1	--	--	2.5
1976	4.2	0.5	1.0	--	--	5.7
1977	--	2.7	1.6	--	--	--
1978	0.7	1.4	2.3	--	0.1	4.5
1979	--	1.0	3.0	--	0.2	4.2

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

Source: FAO, Yearbook of Fishery Statistics - Fishery Commodities, Rome, Italy, 1967-76.

Australia has never imported significant quantities of frozen salmon. Since February 1976, there has been 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 in the future.

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 800 tonnes in the decade from 1967 to 1976. Japan accounted for 56% of the supply in this period, while Canada accounted for nearly all of the remainder. There is also a ban on the import of frozen salmon to New Zealand. This market therefore provides a potential for increasing exports of canned salmon, projected at 1 000 tonnes from the 800 tonnes recorded in 1979 (Table 24).

TABLE 24

Imports of canned salmon to New Zealand by country of origin

(000 tonnes)

Year	Canada	Japan	Other	Total[1]
1967	0.5	0.2	--	0.7
1968	0.5	0.2	--	0.7
1969	0.4	0.3	--	0.7
1970	0.7	0.5	--	1.2
1971	0.5	0.4	--	0.9
1972	0.5	0.4	--	0.9
1973	1.0	0.5	--	1.5
1974	0.3	0.3	--	0.6
1975	0.1	0.4	--	0.5
1976	0.3	0.5	--	0.8
1977	0.3	--	--	--
1978	0.7	--	0.2	0.9
1979	0.8	--	0.2	1.0

[1] Small quantities from other countries not included in total.

Sources: 1. FAO, Yearbook of Fisheries Statistics - Fishery Commodities, Rome, Italy, 1967-76.
2. Canadian Department of Industry, Trade and Commerce.

C-IV-2 Japan

Consumption of salmon products is estimated to be about 200 000 tonnes per year. Japanese salmon landings declined from 159 000 tonnes in 1975 to 103 000 tonnes in 1978 but in 1979 increased to 135 000 tonnes because of a record run of Hokkaido chum salmon. The shortfall prior to 1979 was caused by a cutback in the Japanese high-seas fishery after extended jurisdiction was established by the USSR and US.

Imports of salmon increased in the 1976 - 1978 period from 4 000 tonnes to 49 780 tonnes. In 1979 imports increased further to nearly 55 000 tonnes despite large domestic landings, causing a glut on the market. The salmon market did not recover until mid-1980 when inventories in Japan had cleared. The projected import requirement for salmon to Japan has been adjusted downward to 50 000 tonnes because Japanese landings on the high seas have remained at 42 500 tonnes, reported, and a possible further quantity of 40 000 tonnes of non-reported landings (See section A-III). It was anticipated earlier that the Japanese high-seas fishery would be phased out completely by 1985 but it appears now that it will be able to survive for longer than that.

Red (sockeye) salmon constitutes 60% to 70% of the quantities imported. If this percentage is maintained, the import potential by 1985 for Japan is projected at 35 000 tonnes of sockeye salmon and 15 000 tonnes of other salmon species. Imports have been provided from US (mainly Alaska), Canada and recently (1980) the USSR (Table 25). Alaska supplies the bulk of these imports, accounting for 82% in 1978 and 84% in 1980. Canada's share declined from 14% in 1978 to 6% in 1980 but this decline is attributed to a shortage of salmon in BC especially of sockeye salmon.

Assuming Canada's share of the imports of frozen salmon to Japan expands to 16% by 1985 with higher catches off BC, exports should increase to the 8 000 tonne level.

It is expected that Alaska will continue to supply the lions share of the market because Japanese importers have invested heavily in the Alaskan

fish processing industry. The fishery occurs there earlier than the BC fishery and prices have traditionally been lower to Alaskan fishermen and processors.

The Japanese market for Canadian smoked salmon is increasing at a fairly substantial rate, from virtually nothing in 1976 to over 160 tonnes in 1979. 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 smoked salmon exports from Canada to Japan will double to the 320 tonne level.

Japan has imported larger quantities of canned salmon in recent years. Exports from Canada to Japan reached 273 tonnes in 1979 but dropped in 1980 with the low catch level in BC. By 1985 these exports are expected to reach 500 tonnes.

The supply of salmon roe to Japan increased from 7 800 tonnes in 1978 to 10 800 tonnes in 1979. In 1978, Canada supplied 1 474 tonnes or 19% of the total imports while in 1980 this quantity declined to 1 153 tonnes or 13% of total imports. For 1985 it is projected that Canada will supply 14% of the total imports, or about 1 200 tonnes.

TABLE 25
Total supply of salmon in Japan by source, 1978-1980, 1985.
(000 tonnes)

Year	Domestic landings	US	Canada	North Korea	USSR	Total imports	Total supply	Stock	Domestic disappearance
1978	103.0*	40.9	7.0	1.9	--	49.7	152.7*	27.0	151.7
1979	135.0*	48.0	4.7	1.4	0.4	54.6	189.6*	28.0	188.6
1980	115.0*	33.0	2.6	1.7	2.0	39.3	182.3*	25.0	157.3
1985	150.0	38.0	8.0	2.0	2.0	50.0	200.0	--	200.0

*Note: These figures reported do not include Japanese catches on the high seas of fish which are destined for North America. Industry sources report that these landings are at least 40 000 tonnes per year.

Source: 1. Worldwide Fisheries Marketing Study - Japan, Phase I, Dept. of Fisheries and Oceans, 1979.
2. Canadian Department of Industry, Trade and Commerce.

There is a good potential for marketing salted salmon in Japan as present consumption of this product is nearly 100 000 tonnes per year. Production on factory ships has declined recently from 42 000 tonnes in 1972 to 21 000 tonnes in 1976, so that a further phase reduction of the high-seas fishery would result in the need for shore plants to process imported products. The percentage of salt content required is from 10% to 30%. 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. Technical study of the Japanese preference should be undertaken to further exploit this market to full potential.

D. SUMMARY AND CONCLUSION

1. The world landings of Atlantic salmon of 7 997 tonnes in 1978 are at a substantially lower level than in the early 1970s. These will probably increase in future years as a result of an extensive salmon farming operation in Norway. Canada and some European countries are also embarking on enhancement programs but significant effects from these will not be apparent by 1985. Since Canada's production is small (only 2 316 tonnes) and is at present being sold at high prices, no change is predicted in marketing patterns for this species in the short-term future.

2. Pacific salmon landings, averaging 400 100 tonnes in the four years from 1974 to 1977, increased to 439 683 tonnes in 1978 and are expected to continue increasing perhaps by as much as 2% per year, resulting in an increment in world production by 1985 of 55 000 tonnes. Canada's landings of 57 455 tonnes (average 1975-78) could increase to 87 000 tonnes by 1985 if enhancement plans are successful and if the decline in natural reproduction can be slowed down or reversed.

3. 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 100 000 tonnes. This has been officially reduced to 42 500 tonnes plus an unreported catch and that may be as much as 40 000 tonnes. Salmon formerly caught by Japan are now being taken by the USSR and the US. Both of these countries recorded 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.

4. These developments have had an impact on the world salmon markets, first by causing a large Japanese demand for frozen salmon from North America (increasing from virtually nil in 1976 to 53 000 tonnes in 1979 (but declining to 36 000 tonnes in 1980), and second by a phasing out of the Japanese canned salmon industry. The fact that the USSR has not been exporting more of its increased production to the major salmon markets creates some opportunity for Canada and the US. However, in the past two years more exports are going from the USSR.

5. At the same time, the overall increase in world demand for salmon products is continuing, especially for red salmon (salted, smoked, fresh and frozen) in Japan and for fresh (thawed) or smoked salmon in Europe. The major species in demand in Europe are chum, chinook and coho, but Atlantic salmon are becoming increasingly popular. The increase in overall demand for salmon has been associated with rapidly rising disposable incomes in the major consuming countries and exchange rates vis-à-vis the US and Canadian dollar. Increasing populations have also had an effect, but to a smaller degree. Recent devaluation in certain currencies such as the German mark are negatively affecting salmon demand.

6. In total it is projected that the major markets should be able to absorb 107 000 tonnes of Canadian salmon in round weight equivalent by 1985. Since potential production will be at 87 000 tonnes, the shortfall may be reflected in higher prices. Major opportunities for increasing Canadian canned exports may arise in the UK, Belgium/Luxembourg, the Netherlands, Australia and New Zealand. Sales of frozen salmon may increase to France, Sweden, Denmark, the Netherlands and Finland. In future years it is likely that the demand for frozen products may again draw salmon away from the canning industry. Lower supplies of canned fish may cause prices to rise and correspondingly a shift in consumption.

7. 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.

8. 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 the UK, Japan, France, US, Australia, Sweden, Belgium/Luxembourg, Denmark,

Italy, the Netherlands and FRG. The best opportunities for sales of canned salmon may be found in Canada, the UK and Australia while for frozen salmon, Canada, Japan and France could be the most important.

APPENDICES

APPENDIX I

CANADIAN SALMON MARKETS WITH PROJECTIONS
FOR 1981 AND 1985

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

TABLE 1
Canadian consumption of salmon products
with projections for 1985[1]

Pacific	1976	1977	1978	1979[3]	1985[3]
			(tonnes)		
Frozen					
Spring (chinook)	1 284	1 917	537	1 995	2 636
Coho	---[2]	1 470	---[2]	1 173	1 547
Chum	1 374	972	2 173	2 665	3 526
Other	444	1 229	---[2]	175	986
Total	3 102	5 588	2 710	6 008	8 695
Canned					
Coho	1 218	1 189	1 542	1 354	1 624
Chum	2 389	2 624	2 042	2 314	2 776
Pink	5 047	7 654	7 931	7 732	9 273
Sockeye	3 441	5 544	5 628	5 486	6 661
Other	108	378	3	258	226
Total	12 203	17 389	17 146	17 144	20 560
Cured	NA	NA	NA	521	900
Atlantic salmon	NA	NA	NA	620	1 237
Total	15 305	22 977	19 856	24 293	31 392
Population (million)	23.1	23.3	23.5	23.7	25.4

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.

3. Distribution between species for 1979 and 1985 is based on the average % for each species for 1977 and 1978.

TABLE 2
Exports of Canadian salmon to the US by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	198	172	187	91	184	552
Coho	59	119	266	49	156	468
Chum	--[1]	--	---	---	---	---
Other	279	944	686	107	93	280
Total	536	1 235	1 139	247	433	1 300
Frozen						
Spring (chinook)	1 388	1 079	1 040	951	1 298	2 652
Coho	241	246	92	191	157	321
Chum	633	355	341	372	165	337
Sockeye	---	---	---	123	54	110
Other	168	260	450	256	137	280
Total	2 430	1 940	1 923	1 893	1 811	3 700
Canned						
Coho	---	---	30	34	1	3
Chum	2	---	67	6	1	3
Sockeye	1	132	127	87	1	145
Pink	318	48	1	17	41	146
Other	53	---	31	44	13	46
Total	374	180	256	188	57	343
Smoked & Spec.	49	87	100	356	115	400
Atlantic						
Fresh	57	73	81	25	130	150
Frozen	109	70	97	83	134	150
Total	166	143	178	108	264	300
Canadian total	3 555	3 585	3 596	2 792	2 680	6 043
Total imports of salmon	4 645	NA	NA	NA	NA	NA
Population	215.9	216.8	219.7	NA	NA	232.0

Note: 1. (--) indicates nil exports.

TABLE 3
Exports of Canadian salmon to the UK by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	1	--	--	--	6	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	1	--	--	--	--	--
Total	2	--	--	--	6	--
Frozen						
Spring (chinook)	28	7	129	116	78	50
Chum	526	331	534	582	289	1 740
Coho	128	92	181	120	330	359
Sockeye	---	---	---	39	67	117
Other	66	93	58	184	257	550
Total	748	523	902	1 041	1 021	2 816
Canned						
Coho	275	154	230	120	284	212
Chum	75	--	17	25	--	44
Sockeye	2 042	3 174	2 901	2 682	3 166	4 747
Pink	1 461	1 846	1 464	1 050	2 013	1 860
Other	9	184	114	159	99	281
Total	3 862	5 358	4 726	4 036	5 562	7 144
Smoked & Spec.	--	2	--	--	--	--
Atlantic						
Fresh	--	--	--	4	3	4
Frozen	14	14	36	11	21	33
Total	14	14	36	15	24	37
Canadian total	4 626	5 897	5 664	5 092	6 613	9 997
Total imports of salmon	21 481	17 172	18 754	20 283	NA	31 764
Population (million)	56.0	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

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	--	9.0	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	5.0	--	--	--	--
Total	--	14.0	--	--	--	--
Frozen						
Spring (chinook)	26.0	21.0	24.0	46	35	41
Chum	557.0	738.0	1 071.0	880	938	1 105
Coho	38.0	5.0	3.0	18	45	53
Sockeye	--	--	--	8	--	--
Other	172.0	290.0	135.0	329	340	401
Total	793.0	1 054.0	1 233.0	1 281	1 358	1 600
Canned						
Coho	21.0	1.0	--	2	1	1
Chum	--	--	--	2	9	11
Sockeye	0.5	1.0	1.0	2	1	1
Pink	20.0	26.0	43.0	13	52	62
Other	1.2	7.0	--	15	--	--
Total	42.7	35.0	44.0	34	63	75
Smoked & Spec.	--	--	--	--	--	--
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	10.0	38.0	1.0	13	3	25
Total	10.0	38.0	1.0	13	3	25
Canadian total	845.7	1 141.0	1 278.0	1 326	1 424	1 700
Total imports of salmon	NA	NA	NA	5 000	NA	NA
Population (million)	5.1	5.2	NA	NA	NA	5.3

TABLE 5
Exports of Canadian salmon to France by product and species with projections to 1985

Pacific	1976	1977	1978 (tonnes)	1979	1980	1985
Fresh						
Spring (chinook)	17	1	--	--	1	--
Coho	11	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	6	--	--	--	--	--
Total	34	1	--	--	1	--
Frozen						
Spring (chinook)	1 145	1 120	1 246	1 592	1 377	1 875
Coho	2 409	3 211	3 283	3 231	3 333	4 538
Chum	151	206	472	514	222	302
Sockeye	--	--	--	35	--	--
Other	73	419	210	417	340	463
Total	3 778	4 956	5 211	5 789	5 272	7 178
Canned						
Coho	--	40	4	--	--	--
Chum	39	236	102	253	157	573
Sockeye	2	7	5	4	6	22
Pink	117	228	74	114	--	--
Other	--	64	17	47	--	--
Total	158	575	202	418	163	595
Smoked & Spec.	--	--	--	--	--	--
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	2	19	44	15	--	25
Total	2	19	44	15	--	25
Canadian total	3 972	5 551	5 457	6 222	5 436	7 798
Total imports of salmon	11 900	15 835	16 691	19 063	NA	28 463
Population (million)	52.8	53.1	53.2	NA	NA	57.1

TABLE 6
Exports of Canadian salmon to West Germany by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	41	--	--	--	--	--
Coho	--	--	--	--	2	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	41	--	--	--	2	--
Frozen						
Spring (chinook)	275	198	298	228	292	351
Coho	162	88	67	75	95	72
Chum	585	592	625	606	710	852
Sockeye	--	--	--	5	30	77
Other	46	78	34	207	123	148
Total	1 068	956	1 024	1 121	1 250	1 500
Canned						
Coho	--	1	--	--	--	--
Chum	7	--	--	--	1	1
Sockeye	5	1	--	1	--	--
Pink	42	17	25	17	21	24
Other	1	--	--	3	--	--
Total	55	19	25	21	22	25
Smoked & Spec.	80	19	--	--	10	50
Atlantic						
Fresh	--	--	--	74	--	--
Frozen	182	383	141	16	257	275
Total	182	383	141	90	257	275
Canadian total	1 426	1 377	1 190	1 232	1 541	1 850
Total imports of salmon	NA	3 537	3 505	NA	NA	6 500
Population (million)	61	61	61	NA	NA	59.7

TABLE 7
Exports of Canadian salmon to Italy by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	--	--
Frozen						
Spring (chinook)	354	247	227	401	358	740
Coho	192	163	101	212	51	105
Chum	66	43	41	228	12	25
Sockeye	--	--	--	30	58	120
Other	41	23	29	164	5	10
Total	653	476	398	1 035	484	1 000
Canned						
Coho	1	3	--	--	--	--
Chum	23	17	2	65	75	89
Sockeye	8	10	9	15	17	20
Pink	135	225	267	347	375	446
Other	3	22	7	68	38	45
Total	170	277	285	495	505	600
Smoked & Spec.	--	--	2	--	2	10
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	--	--	--	--	--	--
Total	--	--	--	--	--	--
Canadian total	823	753	685	1 530	991	1 610
Total imports of salmon	1 100	1 102	1 105	2 376	NA	NA
Population (million)	55.0	56.0	56.9	NA	NA	59.0

TABLE 8
Exports of Canadian salmon to the Netherlands by product and species with projections to 1985

Pacific	1976	1977	1978 (tonnes)	1979	1980	1985
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	--	--
Frozen						
Spring (chinook)	116	47	85	--	173	219
Coho	100	120	107	130	211	267
Chum	90	38	44	82	142	180
Sockeye	--	--	--	33	21	26
Other	28	20	47	--	5	8
Total	334	225	283	245	552	700
Canned						
Coho	3	35	33	--	7	20
Chum	5	62	--	111	48	137
Sockeye	72	118	149	--	59	168
Pink	52	538	666	247	189	538
Other	--	--	85	--	48	137
Total	132	753	933	358	351	1 000
Smoked & Spec.	--	--	--	--	--	--
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	1	--	--	--	5	5
Total	1	--	--	--	5	5
Canadian total	467	978	1 216	603	908	1 705
Total imports of salmon	5 330	5 000	6 060	NA	NA	NA
Population (million)	13.8	13.9	14.0	NA	NA	14.5

TABLE 9
Exports of Canadian salmon to Belgium/Luxembourg by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	--	--
Frozen						
Spring (chinook)	170	41	33	40	39	42
Coho	160	448	288	369	443	479
Chum	2	49	35	20	14	15
Sockeye	--	--	--	70	1	1
Other	--	27	30	78	58	63
Total	332	565	386	577	555	600
Canned						
Coho	15	18	9	--	--	--
Chum	117	203	82	99	43	63
Sockeye	143	293	300	159	195	285
Pink	882	1282	1447	1182	1118	1636
Other	15	26	27	38	11	16
Total	1 172	1 822	1 865	1 478	1 367	2 000
Smoked & Spec.	--	--	--	--	--	--
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	2	--	1	--	--	--
Total	2	--	1	--	--	--
Canadian total	1 506	2 387	2 252	2 055	1 922	2 600
Total imports of salmon	6 765	5 805	NA	NA	NA	NA
Population (million)	10.2	10.3	10.3	NA	NA	10.6

TABLE 10
Exports of Canadian salmon to Finland by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	--	--
Frozen						
Spring (chinook)	--	1	--	--	--	--
Coho	--	--	--	--	6	11
Chum	--	4	11	2	6	11
Other	--	3	13	16	2	3
Total	--	8	24	18	14	25
Canned						
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Sockeye	--	--	--	--	7	10
Pink	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	7	10
Smoked & Spec.	--	2	--	--	--	--
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	--	--	--	--	--	--
Total	--	--	--	--	--	--
Canadian total	--	10	24	18	21	35
Total imports of salmon	394	239	--	NA	NA	NA
Population (million)	4.7	4.7	4.7	NA	NA	4.7

TABLE 11
Exports of Canadian salmon to Sweden by product and species with projections to 1985

Pacific	1976	1977	1978 (tonnes)	1979	1980	1985
Fresh						
Spring (chinook)	--	--	--	8	1	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	20	--	--	--	--
Total	--	20	--	8	1	--
Frozen						
Spring (chinook)	131	38	84	109	228	283
Coho	53	27	32	21	54	67
Chum	1 197	732	1 284	1 250	1 074	1 337
Sockeye	--	--	--	9	--	--
Other	182	742	241	1 106	854	1 063
Total	1 563	1 539	1 641	2 495	2 210	2 750
Canned						
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Sockeye	--	--	--	--	7	10
Pink	2	--	5	1	5	10
Other	1	5	--	--	--	--
Total	3	5	5	1	12	20
Smoked & Spec.	33	24	--	10	12	25
Atlantic						
Fresh	--	15	--	--	--	--
Frozen	102	6	5	--	--	25
Total	102	21	5	--	--	25
Canadian total	1 701	1 609	1 651	2 514	2 235	2 820
Total imports of salmon	NA	NA	NA	NA	NA	NA
Population (million)	8.2	8.3	NA	NA	NA	8.4

TABLE 12
Exports of Canadian salmon to Spain by product and species with projections to 1985

Pacific	1976	1977	1978 (tonnes)	1979	1980	1985
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	15	--	--	--	--
Total	--	15	--	--	--	--
Frozen						
Spring (chinook)	4	10	--	--	11	--
Coho	4	--	--	--	--	--
Chum	15	20	49	56	46	100
Other	--	--	--	--	--	--
Total	24	30	49	56	57	100
Canned						
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Sockeye	1	--	136	--	--	100
Pink	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	1	--	136	--	--	100
Smoked & Spec.	--	2	--	--	--	--
Atlatnic						
Fresh	--	--	--	--	--	--
Frozen	--	--	--	--	--	--
Total	--	--	--	--	--	--
Canadian total	25	47	185	56	57	200
Total imports of salmon	N/A	386	NA	233	NA	400
Population (million)	35.8	36	NA	NA	NA	40

TABLE 13
Exports of Canadian salmon to Australia by product and species with projections to 1985

Pacific	1976	1977	1978 (tonnes)	1979	1980	1985
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	1	--	--	--	--	--
Total	1	--	--	--	--	--
Frozen						
Spring (chinook)	8	--	10	9	57	18
Coho	--	--	--	--	--	--
Chum	--	--	--	1	--	--
Sockeye	--	--	--	25	--	45
Other	3	--	--	2	1	37
Total	11	--	10	37	58	100
Canned						
Coho	7	81	--	--	--	--
Chum	--	1	--	--	--	--
Sockeye	270	745	717	387	603	1 418
Pink	191	1 776	722	420	621	1 458
Other	21	55	1	176	53	124
Total	489	2 658	1 440	983	1 277	3 000
Smoked & Spec.	21	20	--	23	57	75
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	--	--	--	--	--	--
Total	--	--	--	--	--	--
Canadian total	522	2 678	1 450	1 043	1 392	3 175
Total imports of salmon	5 700	6 726	NA	NA	NA	NA
Population (million)	13.7	14.1	14.3	14.4	14.6	15.6

TABLE 14
Exports of Canadian salmon to New Zealand by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	--	--	--	--	--	--
Coho	--	--	--	--	--	--
Chum	--	--	--	--	--	--
Other	--	--	--	--	--	--
Total	--	--	--	--	--	--
Frozen						
Spring (chinook)	--	--	--	2	--	--
Coho	--	--	--	1	--	--
Chum	--	--	--	3	--	--
Other	--	--	--	--	1	--
Total	--	--	--	6	1	--
Canned						
Coho	1	3	35	26	33	20
Chum	112	37	32	25	14	30
Sockeye	245	72	63	67	67	80
Pink	1 029	276	516	584	545	700
Other	88	28	29	90	121	170
Total	1 475	416	675	792	780	1 000
Smoked & Spec.	2	--	2	--	--	0
Atlantic						
Fresh	--	--	--	--	--	--
Frozen	--	--	--	--	--	--
Total	--	--	--	--	--	--
Canadian total	1 477	416	677	798	781	1 000
Total imports of salmon	NA	NA	NA	NA	NA	NA
Population (million)	3.1	3.1	NA	NA	NA	3.5

TABLE 15
Exports of Canadian salmon to Japan by product and species with projections to 1985

Pacific	1976	1977	1978	1979	1980	1985
			(tonnes)			
Fresh						
Spring (chinook)	1	--	2	--	--	--
Coho	2	--	28	8	17	--
Chum	--	--	--	--	--	--
Other	--	--	3	--	--	--
Total	3	--	33	8	17	--
Frozen						
Spring (chinook)	60	502	561	134	136	498
Coho	107	785	1 935	185	874	1 600
Chum	2	334	918	454	61	224
Sockeye	--	--	--	3 191	847	4 705
Other	169	1 504	5 963	530	265	973
Total	338	3 25	9 377	4 494	2 183	8 000
Canned						
Coho	--	--	--	--	--	--
Chum	--	--	--	41	--	76
Sockeye	--	--	--	195	--	357
Pink	1	--	--	35	21	64
Other	--	--	16	2	--	3
Total	1	--	16	273	21	500
Smoked & Spec.	3	2	102	160	31	320
Salmon Roe	--	--	1 474	901	677	800
ATLANTIC						
Fresh	--	--	--	--	--	--
Frozen	--	19	14	1	--	15
Total	--	19	14	1	--	15
Canadian total	345	3 146	11 016	5 837	2 929	9 635
Total imports of salmon	1 678	8 754	49 737	NA	NA	NA
Population (million)	113.1	114.2	NA	NA	NA	NA

TABLE 16
Canadian salmon market forecast - major markets (tonnes) to 1985

	Frozen						Canned						Roe	Cured[1]	Salmon[1] total
	Spring	Coho	Chum	Sockeye	Other[1]	Total	Coho	Chum	Pink	Sockeye	Other	Total			
North America															
Canada	2 636	1 547	3 526	--	2 223	9 932	1 624	2 776	9 273	6 661	226	20 560		900	31 392
USA	3 204	789	337	110	860	5 300	3	3	145	3	46	200		400	5 900
West. Europe (EC)															
UK	50	359	1 740	117	587	2 853	212	44	1 860	4 747	281	7 144		--	9 997
Denmark	41	53	1 105	--	426	1 625	1	11	1	62	--	75		--	1 700
France	1 875	4 538	302	--	488	7 103	--	373	164	22	--	559		--	7 762
FRG	351	72	852	77	423	1 775	--	1	24	--	--	25		50	1 850
Italy	740	105	25	120	10	1 000	--	89	446	20	45	600		10	1 610
Neth.	219	267	180	26	13	705	20	137	538	168	137	1 000		--	1 705
Bel/Lux.	42	479	15	1	63	600	--	63	1 636	285	16	2 000		--	2 600
West. Europe (Non-EC)															
Finland	--	11	11	--	3	25	--	--	--	10	--	10		--	35
Sweden	283	67	1 337	--	1 088	2 775	--	--	10	--	--	10		25	2 810
Spain	--	--	100	--	--	100	--	--	--	100	--	100		--	200
Pacific															
Australia	18	--	--	45	37	100	--	--	1 458	1 418	124	3 000		75	3 100
N. Zealand	--	--	--	--	--	--	20	30	700	0	170	1 000		0	1 000
Japan	498	1 600	224	4 705	988	8 015	--	76	357	64	3	500	1 200	320	10 035
Total product wt.	9 957	9 887	9 754	5 201	7 209	42 008	1 880	3 803	16 612	13 560	1 048	36 783	1 200	1 780	81 696
Total round wt.	11 948	11 864	11 705	6 241	8 651	50 410	2 745	5 552	24 253	19 914	1 530	53 674	NIL	3 026	107 110

1 Includes Atlantic salmon. See Table 17.

Source: Authors estimates in consultation with industry officials.

TABLE 17

Canadian Atlantic salmon market forecast to 1985

Country	(A) Existing Supply	(B) An increase in supply(1)
Canada	1 237	2 684
US	300	420
UK	37	37
Denmark	25	10
France	25	25
FRG	275	200
Italy	--	--
Netherlands	5	5
Belgium/Luxembourg	--	1
Finland	--	--
Sweden	25	6
Australia	--	--
N. Zealand	--	--
Japan	15	20
Sub-total	1 944	3 408
Other	38	76
Total-Product weight	1 982	3 484
Total-Round weight	2 378	4 181

1 Atlantic salmon biologists with the Canadian Department of Fisheries and Oceans report that there will not be any significant quantity of enhanced production by 1985 as the Atlantic salmon enhancement program is not yet significantly underway.

Source: Marketing Services Branch, Dept. of Fisheries and Oceans, Ottawa.

APPENDIX II

SALMON MARKET PROJECTION ASSUMPTIONS

1. Canada

   (a) Per capita consumption of canned and frozen salmon will increase slightly from present levels.

   (b) Population will increase to 25.7 million by 1985.

   (c) Imports will be replaced by Canadian supplies.

2. United States

   (a) The trade in frozen salmon will increase somewhat because of more supplies in Canada and strong demand in US.

3. United Kingdom

   (a) Frozen salmon per capita consumption and exports 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 of canned salmon to the level attained a decade ago. This will be possible if Japanese supplies continue to be low and if the USSR and US do not increase their shares of the market substantially.

4. France

   (a) Canada will supply slightly increasing quantities of frozen salmon because of increasing per capita consumption and population. Total frozen salmon imports will grow at a faster pace than exports from Canada because of increased supplies of farmed salmon from Norway.

   (b) Canada's exports of canned salmon to France will increase significantly from the 1978 level because of more acceptable quality.

5. Denmark

   A slight increase is projected based on population increase.

6. West Germany

   (a) This market will remain strong due to a projected 10% 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 1976-1980. This assumes that Japan and the USSR 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 is projected based on past years' increases. This assumes that Canada will continue to obtain a larger share of the market.

   (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 exports of frozen products 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 is 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 is projected, 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 are projected to increase significantly providing Japan continues to be short in supply and providing the USSR does not significantly increase exports to these countries.

14. Japan

The projection is for Japan to increase frozen salmon imports from Canada to nearly the 1978 level. This is based on the following assumptions:

(a) Japan will maintain domestic landings of 150 000 tonnes through a continuation of the present level of high-seas fishing. (If this fishery is phased out, as originally thought, then a much greater salmon demand will be forthcoming).

(b) Consumption of salmon in Japan will remain at around 200 000 tonnes, resulting in an import requirement of 50 000 tonnes.

(c) The Canadian proportion of Japan's import requirement will stabilize at 16% in future years.

(d) Imports from USSR and North Korea will level off at the 1980 volumes.