ANNEX TO THE WORLDWIDE FISHERIES MARKETING STUDY: PROSPECTS TO 1985

SHELLFISH

REVISED 1981

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

SHELLFISH

Original study team:
J. Mc Taggart
Department of Industry, Trade and Commerce

J. Richard
Department of Industry, Trade and Commerce

F. Davis
Department of Industry, Trade and Commerce

Update Author
G.W. Raynes
Department of Fisheries and Oceans

December, 1981.

ACKNOWLEDGEMENT

The preparation of the Worldwide Fisheries Marketing Study, of which this Report is a part, embodies many hours of work not only by the authors but also and more importantly by those who generously provided us with market information and advice.

Specifically, this Report would not have been possible without the cooperation and assistance of fishermen, processors, brokers, wholesalers, distributors, retailers, consumers and their organizations as well as government officials with whom we visited and interviewed. Though too numerous to mention separately, we would like to extend our sincere gratitude and appreciation.

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

With regard to the overall Study, we would like to acknowledge:

- the encouragement and guidance of G.C. Vernon and J. John, Department of Fisheries and Oceans (DFO);
- the advice of K. Campbell, Fisheries Council of Canada; and R. Bulmer, Canadian Association of Fish Exporters;
- the liaison work of M. Foubert, DFO;
- the cooperation of the Department of Industry, Trade and Commerce (IT&C);
- the dedication of the participants from various parts of the industry and government including officers at our diplomatic posts who formed the study teams;
- the analytical and editorial assistance of K. Hay and his staff at Economix International;
- the general assistance within DFO provided by the Headquarters word processing support services and the staff of the Marketing Services Branch.

To all of the above, we extend our thanks.

E. Wong
December, 1981.

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

Marketing Services Branch.
Marketing Directorate.
Fisheries Economic Development and Marketing.
Department of Fisheries and Oceans.
October, 1981.
Ottawa

WORLDWIDE FISHERIES MARKETING STUDY
SHELLFISH

Table of Contents

A. INTRODUCTION

This report focuses on the major shellfish species produced by the Canadian fishing industry, with emphasis on worldwide marketing prospects projected to 1985. It should be noted that squid and squid products are excluded to the extent possible, as these are the subject of a separate report in the series Worldwide Fisheries Marketing Study.

In 1980, according to preliminary data, Canadian fishermen landed slightly more than 150 600 tonnes (round weight) of the major species of shellfish dealt with in this report. Projections to 1985 indicate that by then Canadian landings could increase to 162 000 tonnes.

The Canadian market doesn't even come close to absorbing a major share of what the domestic fishery can produce. Table 5 tells the story, showing that estimated aggregate consumption of the main shellfish species in Canada in 1979 came to a mere 22 049 tonnes (edible weight). And of this total, imports into Canada came to 18 130 tonnes (product weight).

Obviously, then, the major markets for Canadian shellfish are foreign countries. As shown in Table 3, Canada exported 32 277[1] tonnes (product weight) of lobster, crab, scallops, shrimp and clams to 35 countries in 1979. The breakdown by species was: lobster products, 12 800 tonnes; scallops, 9 032 tonnes; crab, 4 075 tonnes, and clam products, 2 456 tonnes.

Canadian shellfish must compete with products from countries all over the world, and many of them are increasing their production. World landings of those shellfish species significant to Canada continue to expand, albeit at a relatively slow rate, as can be seen in Table 1.

---

[1] Does not include shellfish products not broken out in the official trade statistics, as for example oysters, abalone and sea urchins.

More detailed data can be found in Appendix I. Canadian landings have also been increasing in respect to some species, notably shrimp, crab and clams. On the other hand, landings of lobster and oysters have remained relatively stable, while the catch of scallops is in a sharp decline.

Nonetheless, and taking into account the volatile nature of world markets, the projections of potential Canadian landings to 1985 indicate considerable supply scope for expansion of export sales -- foreign markets can be tabled -- for shrimp and crab, in particular, as well as for lobster and molluscs, including oysters, but to a lesser degree.

The major markets for Canadian shellfish are the United States; countries of the European Community (EC) notably France, the United Kingdom, Belgium, the Netherlands, West Germany, Denmark, Sweden, Norway and Japan.

On the aggregate, these countries accounted for about 99% of Canadian exports. The US is the largest single market for each of the shellfish products (except shrimp) under review. Apart from the US, the major markets for lobster and crab are France, Belgium, the Netherlands and Sweden; for scallops, France, Sweden, Denmark, Japan and Norway; and for clams, Japan.

Trends in the volume of exports and their relative importance in Canada's export trade in shellfish products can be ascertained from Table 4. Relative to 1975, the export tonnage in 1979 of all the major groups was sharply increased. This was the situation even with scallops despite a declining trend that became apparent, for supply reasons, after 1977. Expansion was also general for individual products, the major exceptions being fresh lobster meat and fresh scallops. The rate of expansion in exports between 1975 and 1979 ranged from 36% in the case of scallops to 280% for shrimp.

In the following pages of this report the market potential for Canadian shellfish products in 41 countries is assessed. It will be seen that, on balance, there are strong prospects for a continuation of the expansion of the past decade up to the mid-1980s.

TABLE 1

World landings of selected shellfish
(000 tonnes, round weight)

Species	1975	1976	1977	1978	1979
Lobster	172	204	185	192	185
- American lobster	31	30	32	33	37
Crab	379	399	443	494	n.a.
- snow crab	52	69	79	80	80
Scallop	291	323	406	429	397
- sea scallop	104	132	212	232	206
Shrimp and Prawn	1 322	1 500	1 672	1 648	1 527
- northern shrimp	182	212	217	242	176
Other species, excluding squid	2 570	2 733	2 900	2 981	n.a.
	5 103	5 602	6 146	6 331	n.a.

Source: FAO Yearbook of Fishery Statistics, Vol. 48, 1978, Rome, Italy.

TABLE 2
Canadian landings of selected shellfish
(tonnes, round weight)

Year	Lobster	Crab	Scallop	Shrimp	Clam	Oyster
1970	16 594	9 018	5 889	2 720	5 322	3 944
1971	17 310	7 862	5 067	2 112	6 905	4 101
1972	15 054	7 979	43 723	1 744	5 324	4 643
1973	16 146	11 327	40 476	2 954	4 627	5 497
1974	14 251	11 733	52 870	4 720	3 671	4 923
1975	17 489	8 280	66 651	5 496	3 620	4 664
1976	16 082	11 835	93 400	8 520	3 574	4 149
1977	17 833	15 590	116 849	10 893	5 006	3 798
1978	19 179	22 636	109 404	11 627	6 492	4 096
1979	21 576	31 445	89 488	13 089	7 807	3 570
1980[1]	19 961	30 775	70 382	17 357	8 822	3 312
1985[2]	25 000	31 000	60 000	32 000	9 000	5 000

[1]Preliminary
[2]Projected potential

Source: Department of Fisheries and Oceans, Ottawa.

TABLE 3

Canadian exports of selected shellfish in 1979, by country

(tonnes, product weight)

Country	Lobster	Crab	Scallop	Shrimp	Clam	Total
United Kingdom	288	309	2	941	26	1 566
Austria	6	0	--	--	--	6
Belgium-Luxembourg	1 011	443	2	--	18	1 474
Denmark	113	21	2	370	7	513
Finland	2	2	--	--	--	4
France	1 494	1 167	134	456	7	3 258
West Germany	331	35	73	198	--	637
Greece	0	4	--	1	--	5
Iceland	2	--	--	--	--	2
Italy	1	--	--	16	37	54
Netherlands	486	330	--	31	--	847
Norway	64	78	--	232	--	374
Portugal	0	--	--	--	--	0
Spain	17	1	--	0	7	25
Sweden	314	269	--	440	--	1 023
Switzerland	30	1	5	61	--	97
Yugoslavia	0	--	--	--	--	0
Kuwait	2	--	--	--	--	2
South Africa	3	--	--	1	--	4
Hong Kong	6	--	--	34	25	65
Singapore	0	--	1	--	--	1
Japan	39	68	--	390	307	804
Taiwan	0	--	--	--	--	0
Thailand	--	--	--	0	--	0
Australia	1	73	14	10	--	98
New Zealand	2	1	--	--	--	3
Venezuela	--	--	1	--	--	1
Bahamas	0	--	--	--	--	0
Bermuda	0	2	21	--	--	23
Barbados	1	1	--	--	--	2
Leeward Windward Is.	1	--	--	--	--	1
Cuba	--	--	--	63	--	63
Fr. West Indies	--	--	--	1	--	1
St. Pierre-Miquelon	10	2	1	0	--	13
United States	8 576	1 268	8 776	669	2 022	21 311
Total	12 800	4 075	9 032	3 914	2 456	32 277

Source: Statistics Canada, Exports by Commodities, Cat. 65-007, December 1979, Ottawa.

TABLE 4

Canadian exports of selected shellfish products

(tonnes, product weight)

	1975	1976	1977	1978	1979
Lobster:					
Lobster in shell, fresh or frozen	7 502	7 336	7 544	7 933	10 803
Lobster meat, fresh, chilled, boiled	98	84	96	29	102
Lobster meat,frozen incl.boiled	1 000	1 255	1 319	1 496	1 610
Lobster and products, canned	200	182	198	358	285
Sub-total	8 800	8 857	9 157	9 816	12 800
Crab:					
Crab, fresh or frozen	1 256	1 223	1 272	2 366	2 448
Crab, canned	463	687	943	1 204	1 627
Sub-total	1 719	1 910	2 215	3 570	4 075
Scallops:					
Scallops,fresh or chilled	1 156	1 110	1 755	940	240
Scallops, frozen	5 464	8 149	10 266	10 297	8 792
Sub-total	6 620	9 259	12 021	11 237	9 032
Shrimp:					
Shrimps and Prawns,fresh or frozen	1 029	1 759	1 968	2 068	3 914
Sub-total	1 029	1 759	1 968	2 068	3 914
Clams:					
Clams, fresh or frozen	707	743	1 400	1 699	2 456
Sub-total	707	743	1 400	1 699	2 456
Total, above species	18 875	22 528	26 761	28 390	32 277
Total, all species, including squid	19 342	24 903	37 975	65 799	69 657

Source: Statistics Canada, Exports by Commodities, Cat. 65-007, December 1979, Ottawa.

B. SHELLFISH MARKETS AND CANADIAN SALES POTENTIAL

1. Canada

If the market for shellfish products in Canada in 1985 is estimated on the basis of expected growth in population and disposable income, and of historical price and income elasticities, a significant expansion in demand can be projected. Assuming an annual price increase of 7% the level of demand for fresh and frozen shellfish, for instance, would rise from an estimated 30 000 tonnes, edible weight basis in 1979 to 44 000 tonnes in 1982. The market in 1985 would be of the order of 46 000 tonnes if a constant per capita consumption after 1982 is assumed.

However, that kind of growth pattern in reality has to be considered is improbable. Factors likely to negate any increase in total demand generated by population growth include the following: the current high level of shellfish prices vis-à-vis competing products notably meats and other seafoods; negative demand influences, especially price increases as the result of relatively static or lower landings, and the current levelling off of the rate of growth in disposable incomes. This view is substantiated by the trend in shellfish consumption in Canada in recent years. As indicated in Table 5, the aggregate consumption of shellfish has fluctuated from year to year, and a growth trend has not been evident.

TABLE 5

Estimated aggregate consumption of shellfish in Canada

Year	Tonnes (edible weight)
1974	21 878
1975	20 798
1976	31 291
1977	24 954
1978	25 597
1979	22 049

Source: Department of Fisheries and Oceans, Ottawa.

As shown in Tables 6 and 7, which set out estimated consumption trends since 1974 on an edible and a product weight basis respectively, there have been divergent trends for individual species.

TABLE 6

Estimated trends in Canadian shellfish consumption

selected species 1974-1979

(tonnes, product weight)

		Fresh and frozen		Canned	Total
		In shell	Meat		
Lobster	1974	3 785	811	278	4 874
	1975	5 064	829	146	6 039
	1976	5 567	1 449	220	7 236
	1977	4 466	--	305	4 771
	1978	3 162	954	105	4 221
	1979	6 264	--	238	6 502
Crab	1974	1 114	1 329	334	2 777
	1975	738	1 229	100	2 067
	1976	1 560	2 277	320	4 157
	1977	939	1 778	513	3 230
	1978	1 283	2 242	460	3 985
	1979	1 743	2 984	142	4 869
Scallops	1974	--	3 122	--	3 122
	1975	--	3 290	--	3 290
	1976	--	6 798	--	6 798
	1977	--	4 000	--	4 000
	1978	--	3 239	--	3 239
	1979	--	2 162	--	2 162
Shrimp	1974	236	7 366	1 674	9 276
	1975	145	6 862	2 092	9 099
	1976	655	8 922	2 996	12 573
	1977	298	8 613	2 414	11 325
	1978	1 475	9 637	1 541	12 653
	1979	1 855	7 238	1 214	10 307
Oysters	1974	1 410	1 082	948	3 440
	1975	1 599	776	1 403	3 778
	1976	1 770	1 959	1 238	4 967
	1977	969	1 213	1 287	3 469
	1978	1 017	1 122	1 184	3 323
	1979	1 266	823	879	2 968

TABLE 6 (Cont'd)

		Fresh and frozen		Canned	Total
		In shell	Meat		
Clams	1974	690	395	2 936	4 021
	1975	542	302	1 896	2 740
	1976	575	114	2 691	3 380
	1977	256	403	2 771	3 430
	1978	408	362	3 129	3 899
	1979	335	868	2 818	4 021
Total: above species					
	1974	7 235	14 105	6 170	27 510
	1975	8 088	13 288	5 637	27 013
	1976	10 127	21 519	7 465	39 111
	1977	6 928	16 007	7 290	30 225
	1978	7 345	17 556	6 419	31 320
	1979	11 463	14 075	5 291	30 829

Source: Economic Policy Branch,
Department of Fisheries and Oceans, Ottawa.

Canadian consumption of scallops in 1979 was, on a product weight basis, the lowest since 1974. Clam consumption fluctuated erratically over the five years after 1974, while the market for oysters tended to contract on balance. To the extent that there has been growth in the lobster market this has been due to increased consumption of lobsters in shell. The two shellfish species that have shown definite growth since 1974 are crab and shrimp because of higher consumption of fresh and frozen in shell and meat products. As is the case with canned products of other species, consumption of canned crab and shrimp has not been expanding.

It is concluded that the foregoing trends in Canadian shellfish consumption, excluding squid, will continue through 1985 and that the overall growth in consumption over 1979 may not exceed 12% to 15%. Potential domestic demand for Canadian shellfish products will depend upon the degree to which Canadian production is competitive with imported shellfish in terms of product characteristics and consumer acceptability, as well as availability - both geographically and over time and prices. Based on the level of imports in the past, indicated in Table 8, it would appear that opportunities for import substitution are limited and it is to be expected that the larger part of the Canadian market for shellfish will continue to be satisfied by imports in 1985. Projections of the total domestic market and of the potential share accruing to Canadian suppliers are contained in Table A1 of Appendix II.

TABLE 7

Canadian imports of selected shellfish products

(tonnes, product weight)

	1975	1976	1977	1978	1979
Lobster:					
Fresh or frozen	2 107	2 524	2 982	2 685	3 357
	2 107	2 524	2 982	2 685	3 357
Crab:					
Fresh or frozen	673	811	1 375	976	1 245
Canned	11	25	206	21	133
	684	836	1 581	997	1 378
Shrimp:					
Fresh or frozen	6 616	8 606	8 924	8 826	8 707
Canned	2 087	2 395	2 212	1 541	1 214
	8 703	11 001	11 136	10 367	9 921
Oysters:					
Fresh or frozen	467	597	490	570	614
Canned	1 333	1 232	1 287	1 184	879
	1 800	1 829	1 777	1 754	1 493
Clams:					
Canned	1 535	2 387	2 063	2 125	1 981
	1 535	2 387	2 063	2 125	1 981
Total	14 829	18 577	19 539	17 928	18 130

Source: Statistics Canada, Imports by Commodities, Cat. 65-007, December 1975-1979, Ottawa.

As for particular shellfish products, divergent market trends are expected. The live lobster market is expected to expand in line with growth in the food service industry. On the other hand the recent growth in the market for lobsters frozen in brine is likely to slacken because of demand constraints in both retail and food service sectors. The prices of hot and cold packs have reached the point were consumer resistance is affecting sales. Pilferage of the hot pack at the retail level is limiting effective merchandising and is a further factor adversely affecting demand.

Relatively low prices for crab products in comparison to king crab should lead to higher consumption of frozen crab. Some recovery in the canned crab market is also probable and may be reinforced by the substitution of canned crab for canned lobster at the retail level.

Supply constraints and very high prices for scallops limit the Canadian market for this shellfish species. As landings in 1985 are expected to be significantly below historical levels there should be a further contraction of the market by 1985.

Exploitation of world resources of shrimp has reached the stage where higher prices are not being reflected in commensurate increases in supply. This situation is being aggravated by rising production costs, among them the price of fuel. Continuing high prices are expected to inhibit consumer demand for warm water shrimp in Canada in the coming years. However, lower prices for the northern shrimp taken by Canadian fishermen, together with greater demand and a growing consumer acceptance of cold water shrimp, should lead to increased Canadian consumption of this particular product. The consumption of both peeled and whole cooked shrimp is expected to increase moderately by 1985.

Canadian and US landings of oysters have been declining in recent years. Neither oysters in shell nor oyster meat appear to be enjoying increasing demand at the consumer level. It is expected then, that there will be little growth in Canadian consumption. Canadian oysters are not likely to increase significantly their market share because of continued failure to respond to the requirements of the market, as well

as to changes in prices and other market conditions. An analogous market situation applies to clams. In the case of both species it will probably be canned products, primarily supplied by imports, that will be the most dynamic product form.

2. United States

The US is by far the most important market for Canadian shellfish, with the value of shipments in excess of $147 million in 1978 and accounting for more than 64% of the value of total Canadian exports of these products. Japan, the second major market for Canadian shellfish, accounted for less than 14% of Canadian exports in that year, and were made up primarily of squid products.

The composition of Canada's trade with the US in shellfish products is set out in Table 9.

TABLE 8
Canadian exports of shellfish to the United States, 1975-1979.
(tonnes, product weight)

	1975	1976	1977	1978	1979
Clams, fresh or frozen	707	741	1 375	1 647	2 022
Crab, fresh or frozen	800	652	480	1 635	1 128
Lobster in shell, fresh or frozen	6 838	6 648	6 263	5 742	7 426
Lobster meat, fresh, chilled, boiled	95	79	85	29	56
Lobster meat, frozen,incl.boiled	934	1 104	1 182	1 288	980
Scallops, fresh or chilled	1 156	1 107	1 755	937	240
Scallops, frozen	5 412	8 093	9 885	9 932	8 536
Shrimp & prawns, fresh & frozen	608	782	615	530	669
Squid, whole, fresh or frozen	--	--	--	--	1 422
Squid, tubes, fresh or frozen	--	--	--	--	150
Shellfish, fresh or frozen NES	213	444	913	1 114	116
Crab, canned	139	65	90	135	140
Lobster and products, canned	110	60	41	148	114
Shellfish and products NES	21	40	29	121	122
Total	17 033	19 815	22 713	23 258	23 121

Source: Statistics Canada, Exports by Commodities, Cat. 65-004, December 1975-1979, Ottawa.

Projected American landings of crab are expected to increase substantially by 1985, while catches of scallops will fall sharply due to over-fishing. Shrimp and lobster catches may possibly increase moderately from 1979 levels. The projected trends are set out in the following table.

TABLE 9

US landings of selected shellfish species

(000 tonnes, round weight)

	1979	1985
Lobster	17	18-22
Crab	148	199-245
Scallops (Meat weight)	14	6-8
Shrimp	153	145-175

Source: U.S. Department of Commerce, Fisheries of the United States, (NMFS) and MSB estimates.

Two lobster species are marketed in the United States, i.e., the American lobster and the spiny lobster. The American lobster (also known as Maine lobsters) is the species exported to the US by Canada, which is the only source of supply other than the American domestic catch. Consumption of this species has been increasing in terms of aggregate product weight, although there have been divergent trends at the level of the individual lobster products. Between 1977 and 1979 US consumption of American lobster increased by nearly 21% to more than 23 000 tonnes, a trend that approximated the growth in American and Canadian landings. During this period the consumption of live lobster expanded, demand for the canned hot pack remained static, and consumption of the cold canned meat pack declined. The consumption of other American lobster products, mainly lobster frozen in the shell, also expanded. The foregoing trends together with projected lobster consumption in 1985 is set out on the next page.

TABLE 10

United States consumption of American lobster

1977-79 and forecast for 1985

(000 tonnes, round weight)

	1977	1978	1979	1985
Live lobster	20.9	21.1	23.4	29.0
Canned-frozen meat	1.0	0.9	0.7	0.5
-hot pack	0.1	0.1	0.1	0.1
Other products	1.1	1.9	3.8	6.0
Total	23.1	24.0	28.0	35.6

Source: IBID.

It is estimated that consumption will increase by 27% over the period 1979 to 1985 and parallel the increase in North American landings. The declining demand for the canned hot pack is expected to stabilize. On the other hand the decline in the retail demand for the canned cold pack is likely to continue and further reduce overall consumption of this product. Live lobster consumption, which accounted for 84% of total demand for American lobster products in the US in 1979, is expected to increase by some 24% by 1985. Other lobster products, including frozen in brine, have been gaining greater market acceptance and this trend is expected to continue.

After estimated US production of American lobster is taken into account it would appear that the potential import requirement for Canadian lobster products could be 9 000 tonnes of live lobster, 85 tonnes of canned lobster, and 800 tonnes of other products in 1985.

The American market for crab products has been declining with aggregate consumption falling from 34 500 tonnes to 27 900 tonnes in product weight terms between 1977 and 1979. The decline was concentrated in the consumption of fresh and frozen crab, as canned crab demand rose from 3 700 tonnes in 1977 to 4 000 tonnes in 1979. Consumption of snow crab, the species produced by Canada, and of king

crab, the major competitior of snow crab, declined sharply, despite increased landings. This additional supply was diverted to export markets, notably Japan.

While it is expected that landings of king crab will decline, and will be of the order of 56 000 to 64 000 tonnes, live weight, in 1985 as against 70 000 tonnes in 1979, a substantial increase in US landings of snow crab is forecast. Landings of this species in 1985 are expected to range between 90 000 and 114 000 tonnes, compared to 60 000 tonnes in 1979. The consequent large increase in domestic supply by 1985 is expected to more than offset a slight increase in domestic consumption and to curtail the demand for imported snow crab.

Recent trends in US imports of crab products, together with 1985 projections are set out below:

TABLE 11

US imports of crab products,
1977-79 and forecast for 1985
(000 tonnes, round weight)

	1977	1978	1979	1985
Crab meat, fresh or frozen	2.8	2.1	1.3	0.8
Canned	1.7	2.4	2.6	3.0
Total	4.5	4.5	3.9	3.8

Source: IBID.

It will be noted that an increase in the import demand for canned crab is forecast, reflecting the rising trend in consumption. It is probable that Canadian exports of canned crab to the US in 1985 will be considerably higher than the 140 tonnes shipped in 1979. In view of the expected decline in import demand for fresh and frozen crab meat, US imports of these products from Canada could fall from the 1979 level of 850 tonnes to about 650 tonnes in 1985.

Meat, either fresh or frozen, is the form in which scallops are marketed in the US. Consumption is closely linked with fluctuations in supply from domestic landings and from imports, mainly from Canada. In 1979 estimated US consumption of scallops, meat weight basis, in the US 26 700 tonnes, as against 28 300 tonnes in the previous year and 25 700 tonnes in 1977.

It is expected there will be a sharp decline in US and Canadian landings by 1985 and this will be reflected in a fall in consumption to possibly 13 700 tonnes. The anticipated lower Canadian catch of scallops could reduce the level of exports to the US to about 5 548 tonnes in 1985 from 8 776 tonnes in 1979.

A very wide range of shrimp products is marketed in the US but the greater proporton in recent years has been either in shell, or peeled but not otherwise processed. Next in importance has been breaded shrimp followed by canned shrimp. Fresh shrimp consumption has been declining for many years and has been replaced in the market by frozen shrimp, which is mainly absorbed by the food service sector. On the other hand most of the canned shrimp is sold through the retail trade.

In general the various shrimp products are not close substitutes: substitution is not likely to occur unless there is an exceptionally wide price differential.

Shrimp consumption in the US has followed a rising long term trend. However, trends since 1977 now point to the cessation of market growth, possibly until at least 1985. This situation is indicated in the following table:

TABLE 12

US consumption of shrimp,
1977-79 and forecast for 1985
(000 tonnes, round weight)

	1977	1978	1979	1985
Fresh and Frozen	202	182	180	192
Canned	18	13	10	8
Total	220	195	190	200

Source: IBID.

Future trends in consumption will be largely dependent on the rate of growth in world landings and the strength of demand from other markets such as Japan. The probability is that the existing world fisheries have, in general, reached the level of maximum sustainable yield. This is particularly true of the American shrimp resource where landings declined from a peak of 216 000 tonnes, round weight, in 1977 to 153 000 tonnes in 1979.

Upwards of 25 countries supply shrimp to the US. Between 1970 and 1979, imports ranged between 87 000 tonnes and 104 000 tonnes. Imports in 1979 totalled 102 000 tonnes, of which 2 000 tonnes consisted of canned shrimp.

It is forecast that US imports of shrimp in 1985 will be about 108 000 tonnes, including 2 000 tonnes of canned shrimp. The potential for increased exports of Canadian frozen shrimp is limited by the fact that northern shrimp occupies a minor position in the US market. Widespread substitution of northern shrimp for warm water shrimp is unlikely unless supply constraints offer no alternative. This means total imports of northern shrimp may be only about 3%, or around 3 000 tonnes, in terms of 1985 import demand. If it is assumed further that Canadian landings do not increase very rapidly, and that more favourable markets continue to exist in Europe, potential Canadian sales to the US may be about 700 tonnes in 1985.

3. European Economic Community

Of the more than 32 000 tonnes of shellfish products[1] exported from Canada in 1979 some 8 350 tonnes, or 26% to the European Economic Community (EC).

(a) United Kingdom

While total per capita consumption of fish in the UK has been declining, and in 1979 was 7.7 kilograms compared with 8.8 kilograms in 1970, the demand for shellfish has remained relatively stable. It is estimated that shellfish consumption, excluding canned, was 0.6 kilograms per capita in 1976 compared with 0.5 kilograms in 1970 and a high for the decade of 0.7 kilograms in 1973 and 1976. Per capita consumption of shellfish, excluding canned, in 1985 is projected at the same level as 1979, namely 0.6 kilograms. Any expansion in demand will therefore be dependent upon population growth, which is projected at 7% over the period 1979 to 1985.

As indicated in Table 14, UK landings of shellfish are projected to increase to 71 000 tonnes in 1985 from 64 282 tonnes in 1979. However, apart from shrimp the increase in landings is concentrated in cockles, whelks and mussels - species for which Canada has yet to develop a supply capacity.

TABLE 13
UK landings of shellfish
(000 tonnes, round weight)

	1977	1978	1979	1985
Dublin Bay prawns	15 051	14 673	15 980	14 000
Lobster	946	846	793	1 000
Crab	8 628	9 579	10 425	10 000
Scallops	5 519	6 816	7 343	7 000
Cockles	17 416	11 597	10 415	14 000
Crawfish	43	--	--	--
Whelks	2 777	3 293	1 785	3 000
Mussels	11 388	7 207	5 510	8 000
Shrimp	2 711	3 211	1 399	3 000
Other	13 153	9 066	10 632	11 000
Total	77 632	66 288	64 282	71 000

Source: UNITED KINGDOM: Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

[1] Lobster, crab, scallop, shrimp and clam products.

In 1979 the UK was a net importer of crustaceans and a net exporter of molluscs. Imports of the latter were 3 430 tonnes while exports totalled 10 616 tonnes. In the case of crustaceans the respective figures were 13 591 tonnes and 11 651 tonnes.

The trends in actual and potential imports of selected shellfish products from Canada and from all sources are set out in Table 15. Additional projections for Canadian exports to the UK in 1985 are set out in Table A-2 of Appendix III.

In general Canadian shellfish sales to the UK have been increasing, and are expected to continue this trend. Primary factors are lack of growth in domestic landings and an exchange rate that is very favourable to Canadian exporters.

There was a doubling in sales of Canadian live lobster to the UK in 1979. Aggressive selling by Canadian exporters and a diversion of domestic production to continental Europe were underlying factors. Although Canadian exporters are now established in this market, very high prices, due in no small measure to increasing "luxury" food taxes, will probably mean slow growth in this specialized market. The markets for canned lobster meat and lobster spread are small.

TABLE 14

UK imports of selected shellfish products
(tonnes, product weight)

	1978		1979		1985[1]	
	Total	Canada	Total	Canada	Total	Canada
Lobster (Homarus spp.)						
- Live	112	42	128	98	225	175
- Whole, other than live	143	137	129	116	150	135
- Other than live or whole	34	4	20	9	23	10
Sub-total	289	183	277	223	398	320
Crabs and crayfish						
- Fresh or frozen	153	2	258	1	345	1
- Canned	577	125	931	283	1 250	380
Sub-total	730	127	1 189	284	1 595	381
Shrimps and Prawns						
- Fresh or frozen (Pendalidae ssp.)	7 743	118	6 857	343	9 190	460
- Fresh or boiled in water (Crangon spp)	213	2	200	2	268	2
- Other (Crangon spp)	306	2	872	20	1 170	26
- Other	3 362	7	4 896	2	6 560	2
Sub-total	11 624	129	12 825	367	17 188	490

[1]Projected

[2]Negligible or nil

Source: UNITED KINGDOM Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

The recent concern over gafkemia in Canadian live lobsters indicates the need for more thorough monitoring to avoid the possibility of future import restrictions. The use of rubber bands rather than wooden pegs should be adopted to avoid damaging the claws.

High prices are dampening the demand for Canadian crab and shrimp although expanded sales are foreseen for 1985.

(b) France

France is the major European market for Canadian shellfish: in 1978 Canadian shipments to that market were valued at $14.1 million.

The traditional interest of the French population in food and an historical awareness of seafoods ensure a continued buoyant market. However, per capita consumption is not expected to increase significantly in the foreseeable future, particularly in the light of the rapid increase in prices relative to other protein products. It is estimated[1] that per capita consumption of shellfish in France in 1979 was 4.4 kilograms, with about 4.06 kilograms consisting of fresh and frozen products, 0.31 kilograms, with canned and processed, and 0.2 kilograms was in other forms. In 1977, per capita consumption of shellfish was somewhat higher than in 1979 at 5.7 kilograms.

In volume terms the domestic disappearance of shellfish in France in 1979 was about 238 000 tonnes, of which 92% was fresh and frozen and 7% was in canned and processed forms.

On the basis of anticipated population growth to 57 million in 1985 from 54.5 million in 1979, aggregate consumption of shellfish is expected to increase by about 4% over the six year period.

---

[1] Source: FRANCE Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

In the absence of a common fisheries policy in the EC, it is difficult to predict the level of French shellfish landings in the medium term. An increase of 20% between 1978 and 1985 is possible. Of significance is the encouragement the French government is providing the acquaculture, and particularly for the expanded production of oysters and mussels. The target for 1985 is an increase of 50% and 70% respectively in the output of oysters and mussels. If this objective is achieved the production of mussels and oysters in 1985 will be about 85 000 tonnes and 14 000 tonnes respectively.

Although a luxury product, Canadian lobster is valued highly by French consumers. Live lobsters comprise the bulk of French lobster imports, but whole frozen lobster in brine is becoming very popular. Shipments of the latter nearly tripled in 1979 and were almost entirely from Canada. While there is pressure from European lobster producers for the establishment of reference prices as a means of reducing competition from Canadian lobster, present indications are that this barrier will not be erected. There is a good potential for a further expansion of sales of Canadian lobster in France, although its status as a luxury product limits the size of the market. The proposed establishment of Canadian owned retail outlets in France and other European countries should stimulate sales of Canadian lobster products.

While the market for crab in France is expected to expand, the sale of Canadian canned crab may be inhibited by the supply of inconsistent quality to this market. While exporters with a reputation for quality may not be effected, other producers may encounter a fall in demand.

The market for shrimp has been expanding rapidly since 1975. While warm water shrimp are the most popular species, the market share of northern shrimp has been growing, and there appears to be good potential for increased Canadian exports of this latter species.

High prices have been limiting the demand for Canadian scallops in France. A further constraining factor is the fact that Canadian producers are not generally prepared to offer scallops with roe, the

preferred product form. For these reasons, together with the rapid decline in Canadian landings of scallops, it is not expected that Canadian shipments to France will recover to the 1977 peak level of 314 tonnes by 1985.

Imports of shellfish into France in 1978 and 1979, and projections for 1985 are set out in Table 16.

TABLE 15
French imports of selected shellfish products
(000 tonnes, product weight)

	1978		1979		1985[1]	
	Total	Canada	Total	Canada	Total	Canada
Lobster (Homarus spp.)						
- Live	748	181	1 100	454	1 580	700
- Whole, other than live	178	166	695	682	1 500	1 400
- Other than live or whole	75	74	5	1	100	50
Sub-total	1 001	421	1 800	1 137	3 180	2 150
Crab and Crayfish						
- Fresh or frozen	2 557	57	3 271	32	4 030	70
- Canned	4 060	1 227	5 741	1 613	7 176	1 800
Sub-total	6 617	1 284	9 012	1 645	11 206	1 870
Shrimps and Prawns						
- Fresh or frozen (Pendalidae ssp.)	6 190	1	8 940	295	10 965	1 206
- Fresh or boiled in water (Crangon spp.)	62	1	81	1	99	1
- Other shrimp and prawns	9 100	1	9 670	1	11 861	1
Sub-total	15 352	3	18 691	297	22 925	1 208
Scallops						
- Frozen	3 846	361	2 723	173	3 575	250

[1]Negligible or nil

Source: FRANCE Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

(c) Belgium

Per capita consumption of fish in Belgium has been increasing and in 1979 reached 15.9 kilograms (edible or product weight) compared with 15.2 kilograms in 1977 and 1978 and 15.5 kilograms in 1976. Consumption of crustaceans and molluscs accounted for 4.7 kilograms or 30% of total aggregate per capita disappearance of seafood in 1979. The growth in per capita shellfish consumption in 1979 relative to 1978 was 0.5 kilograms or 12%.

The apparent consumption of shellfish by species in 1979 was as follows:

TABLE 16

Belgian consumption of shellfish 1979

(tonnes, product weight)

Lobster	1 180
Crab (including crayfish)	447
Shrimp (raw, in shell)	3 541
Shrimp (cooked, peeled)	5 410
Scallops	---
Canned crab	1 337
Other canned shellfish	228

Source: Canadian Embassy, Brussels.

Belgian landings of shellfish will probably remain static to 1985, apart from shrimp catches which are expected to decline very significantly[1]. With the trend toward increased consumer affluence there should therefore be a further growth in imports of shellfish, which accounted for one third of total imports of seafoods in 1978. In recent years the growth in shellfish imports has been concentrated in the fresh product categories and purchases of preserved or canned shellfish have remained steady. As Belgium depends on other EC countries for most of its import requirements, reduction in their supply capability would provide greater opportunities for other suppliers.

---

[1]BELGIUM: Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

Between 1975 and 1979, total Canadian exports of shellfish to Belgium increased dramatically from 214 tonnes to 1 474 tonnes[1]. The major growth over the period has been in lobster products, particularly in shell, and crab products, especially frozen. In addition there is potential for peeled shrimp, scallops with roe and mussels. Providing there are no supply shortages in Canada, the favourable trend in Canadian shellfish sales to Belgium should continue in the years ahead.

(d) The Netherlands

Shellfish consumption has been increasing in the Netherlands and in 1978 was 3.4 kilograms per capita mostly fresh and frozen products, with mussels the major species. Some slight growth in per capita consumption to 3.5 kilograms[2] has been forecast for 1985. When expected population growth is taken into account, domestic consumption of fresh and frozen shellfish could expand by more than 3 000 tonnes to 50 700 tonnes between 1978 and 1985. The expected growth in shellfish consumption, combined with static and minor domestic landings of lobster and crab, rapidly falling landings of shrimp, and non-existent catches of scallops, indicate opportunities for Canada. As is the case with Belgium the demand[3] for Canadian shellfish in the Netherlands has been expanding rapidly, and between 1975 and 1979 Canadian sales increased by some 314% to 881 tonnes. While Canada has established a market here for the major shellfish species other than scallops, the primary growth is taking place in lobster in shell and in canned and frozen crab. Continued market growth will depend largely on the supply of products of consistent quality. The elimination of smut would remove an inhibiting influence on Canadian sales of canned crab to the Netherlands, as well as on the price the product can command in that market.

[1]Includes exports to Luxembourg.

[2]NETHERLANDS Annex to the Worldwide Fisheries Marketing Study; Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

[3]To a significant degree the Dutch demand for Canadian shellfish is derived from the demand in other EC countries, to which much of the product is re-exported.

(e) West Germany (FRG)

West German landings of shellfish are restricted to shrimp, which is used for non-edible products as well as for human consumption, to mussels and to a small volume of scallops. Landings of shrimp for industrial and edible use were 5 900 tonnes and 10 800 tonnes respectively in 1978, while those of mussels and scallops were 16 300 tonnes. Relative to 1978, a substantial decline is forecast for combined landings of mussels and scallops by 1985. Landings of shrimp may increase somewhat over this period.

TABLE 17

West German supply of shellfish

(000 tonnes, catch weight)

	1976	1977	1978	1979
Landings:				
Shrimp for edible use	15.9	9.2	10.8	14.5
Shrimp for industrial use	(11.1)	(9.0)	(5.9)	(5.1)
Mussels and scallops	25.4	13.6	16.3	8.5
Imports[1]	9.0	8.5	9.6	15.7
Exports[1]	23.5	8.2	9.5	9.9
Domestic raw material supply for human consumption	26.8	23.1	27.2	28.8

[1]Includes processed products and squid.

Source: WEST GERMANY Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985; November 1980. Department of Fisheries and Oceans, Ottawa.

Although the West German population is slowly declining it is expected that aggregate consumption of shellfish will expand by 1985 because of increasing per capita demand[1]. Per capita consumption of shellfish[2] in 1978 was 5.97 kilograms, product weight basis, compared with 5.99 kilograms in 1977 and 6.09 kilograms in 1976, when consumption was at a peak.

The magnitude and range of West German imports of shellfish products are illustrated in Table 19. Imports are expected to expand by 1985, and to include increased volumes of Canadian shellfish of the order indicated in Table 2 of Appendix III.

(f) Denmark

Although Denmark ranks sixth among EC countries as a market for Canadian shellfish products, it is also a major competitor in other markets, notably in Europe. As the major exporter of fish products in the EC, and the fourth largest in the world, Denmark is a substantial net exporter of shellfish. The domestic demand for shellfish, as for other seafoods, is therefore largely dependent upon the situation in export markets.

In the absence of statistics of total shellfish consumption it can only be noted that consumption of seafoods in general was some 21.7 kilograms in 1977, little changed from 1970. On the basis of a population of 5.11 million in 1979, aggregate consumption of prepared fish products would be of the order of 110 000 tonnes annually. Population is expected to remain virtually static, increasing only to 5.2 million by 1985, and thus will not be a significant factor in potential demand.

---

[1]An underlying assumption is that shellfish will be the subject of promotional activities by the fishing industry in the coming years.

[2]Preliminary. Includes squid production.

TABLE 18
West German imports of shellfish products
(000 tonnes, catch weight)

	1976	1977
Lobster:		
Rock lobster	59.6	68.0
Lobster, live	209.0	215.4
Lobster, whole	33.7	30.3
Other	8.3	11.3
Shrimp:		
Pandalidae	431.2	679.3
Other	2 342.9	2 398.5
Other crustacea	66.8	76.1
Molluscs:		
Oysters	232.9	227.1
Mussels	2 584.2	1 770.4
Snails, excluding sea snails	448.0	239.5
Other molluscs:	471.7	244.4
Shellfish preparations[1]	--	8 266.4

[1]May include squid products.

Source: WEST GERMANY Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

In the case of northern shrimp, the major shellfish species other than lobster marketed by Canada in Denmark, it has been estimated[1] that apparent Danish consumption was some 6 900 tonnes and 5 100 tonnes in 1978 and 1979 respectively. By comparison Canadian exports of shrimp to Denmark are small, being only six tonnes in 1978 and 370 tonnes in 1979.

In the case of northern shrimp, the major shellfish species other than lobster marketed by Canada in Denmark, it has been estimated[1] that apparent Danish consumption was some 6 900 tonnes and 5 100 tonnes in

[1]DENMARK Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

1978 and 1979 respectively. By comparison Canadian exports of shrimp to Denmark are small, being only six tonnes in 1978 and 370 tonnes in 1979.

Danish landings of northern shrimp totalled 4 300 tonnes in 1979. In the light of declining catches since 1977 a significant expansion in landings over historical volumes is not anticipated. Similarly landings of Norway lobster have been declining since 1975. However, as little is known of the factors influencing the resource it is not possible to gauge the magnitude of future catches. Landings of European lobster have not exceeded 16 tonnes annually in recent years. In the case of crab, the third important shellfish species exported by Canada to Denmark, it appears that there are no Danish landings. Canadian exports were a very small proportion of Danish shellfish imports, being little over 500 tonnes in 1979 and consisting mainly of frozen shrimp and fresh and frozen lobster in shell (Table 21).

However, in view of the probable trend in future Danish landings of northern shrimp and the very large volume of imports Canada should have no problem in finding buyers for good quality shrimp. In regard to lobster products Canada was the major foreign source of supply to Denmark in 1979. As Danish landings of European lobster are nominal there should be good opportunities for Canadian exporters of lobster products in the future. The outlook is also good for limited exports of first quality crab products. Canada was the leading supplier of frozen crab meat to Denmark in 1979. Relatively incomes and high consumer orientation toward seafoods strengthen Denmark's potential as a market for luxury class shellfish, notably lobster, shrimp and crab.

TABLE 19

Danish imports of shellfish products

(tonnes, product weight)

	1977	1978	1979
Shellfish			
- Shrimp	8 979	11 584	11 887
- Other	449	564	608
Sub-Total	9 428	12 148	12 495
Shellfish preparations			
- Shrimp	5 431	5 076	5 884
- Other	485	593	542
Sub-total	5 916	5 669	6 426
Total	15 344	17 817	18 921

Source: DENMARK Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

TABLE 20

Canadian exports of selected shellfish products to Denmark[1]

(000 tonnes, product weight)

	1977	1978	1979
Lobster			
In shell, fresh or frozen	15	25	101
Meat, fresh or frozen	4	0	11
Canned	1	3	1
Crab			
Fresh or frozen	20	17	8
Canned	6	4	13
Shrimp			
Fresh or frozen	--	6	370
Scallops			
Shucked, fresh or frozen	2	2	2
Clams			
Fresh or frozen	--	--	7

[1]Does not include shellfish NES

Source: Statistics Canada, Exports by Commodities, Cat. 65-004, December 1977-79, Ottawa.

4. Other EC countries

The medium term potential of Ireland, Greece and Italy as markets for Canadian shellfish is poor, especially when squid, which is the subject of a separate study is excluded. Historically these countries have been markets for minor, if not insignificant, quantities of Canadian shellfish, as indicated in Table 22, which combines exports from Canada to these three countries in 1979.

A departmental study team has not as yet carried out research into the Irish market for shellfish products. At this juncture there does not appear to be significant market potential, given a low level of income per head a small population of only 3 million, and an import-export balance in shellfish products that is very strongly oriented toward net exports. Between 1975 and 1979 Canadian exports to Ireland were non-existent.

5. Other Western European Countries

(a) Spain

Little information is available on consumption of shellfish in Spain. On the basis of available data[1] on Spanish production, imports and exports and population of 36.8 million, it would appear that per capita consumption of shellfish[2] was around 6 kilograms in 1978 and total consumption was about 225 000 tonnes, product weight. It also appears that in aggregate terms the source of supply is essentially the domestic catch. The production of shellfish products in Spain in 1978 was about 225 000 tonnes, while exports and imports were in balance at 88 000 tonnes. Of this latter figure some 36 000 tonnes is estimated to

---

1 Overview of Western European Fisheries (excluding EC member states), 1977-1979. Department of Fisheries and Oceans, Ottawa, 1979.

2 Includes squid. It is estimated that the Spanish consumption of squid ranged between 50 000 and 55 000 tonnes, round weight in 1978.

be squid. The balance of Spain's shellfish imports[3] could include scampi, various species of lobster, crab mainly (Cancer pagurus) scallops mainly (Pecten maximum) shrimp and prawns, cockles, winkles and clams. It is relevant to note that Spain is a substantial producer of blue mussels, shrimp, and to a lesser extent of Norway lobster.

There is also uncertainty as to the level of future Spanish shellfish imports. In all probability Spain will join the EC before 1985 and this will mean a liberalization of foreign trade and a less restrictive, import licensing system, if not outright abolition.

Canadian exports of shellfish other than squid to Spain totalled 25 tonnes in 1979, of which 17 tonnes were lobsters in shell, seven tonnes fresh or frozen clams and one tonne was fresh or frozen crab. In 1980 Canadian exports fell to zero for crab, and to two tonnes for lobster. Shipments of clams increased to 15 tonnes.

Apart from clams, significant market potential for Canadian shellfish in Spain has not been identified. Spanish imports of live and frozen loster in 1979 probably were well below 100 tonnes, while canned lobster, which is less expensive, is almost unknown. Consequently only a very limited market exists for these products. Both frozen whole and frozen in brine lobster products have been tested in the Spanish market by Canadian exporters but with little success. High prices and consumers' dislike of the claws were inhibiting factors.

---

[3]In 1978 Spanish imports of shellfish other than squid totalled about 54 000 tonnes of which 43% consisted of venus clams. The next major import category were prawns at 6 400 tonnes. Other imports with volumes under 1 500 tonnes were spider crabs, nephrops, clams and oysters. Shellfish preparations, which may include squid products, totalled over 2 200 tonnes.

The high price of scallops limits its market potential but there is interest in whole scallops with roe. Pre-cooked scallop gratiné on half shell has been successfully market tested by one Canadian firm. Consumer preference for shrimp favours the larger warm water species. However northern shrimp is also sold in Spain and to that extent there is a possible market for Canadian shrimp. Shrimp is usually marketed in the raw, whole form in Spain. Frozen crab meat is almost unknown, and consumption of canned crab is very small. The popular crab products are frozen legs and sections. In the case of clams there is definite potential for Canadian suppliers since the domestic catch is inadequate to meet the Spanish demand for this popular shellfish. However the Canadian Atlantic coast clam is not at present acceptable, and only the Manila clam from British Columbia is being exported to Spain. The latter resource is limited relative to potential Spanish demand and future shipments to 1985 are expected to be about 300 tonnes annually.

Clams shipped to Spain suffer high mortality as consignments are purified in chlorine upon arrival. No import demand exists for mussels as foreign suppliers cannot compete with the low prices of the domestic product. British Columbia barnacles have not been accepted in Spain because of toughness of the meat and what consumers consider an unusual taste. Frozen shelled cockles are imported and there may be a potential for Canada. The preferred count is 330 to 600 pieces per kilogram.

(b) Portugal

Portugal is not a market for Canadian shellfish products other than squid. Between 1975 and 1979, for instance, Canadian shipments to Portugal were confined to a negligible quantity of lobster in shell in 1977.

Not only are consumer preferences not conducive to sales of the categories of shellfish dealt with in this report, but there is not the purchasing power in Portugal to support significant demand. Per capita income is the lowest of any of the nations in either the EC or the European Free Trade Association (EFTA), with the exception of Turkey.[1] In addition high surcharges are being levied on imports of molluscs and crustacea, unless intended for canning and re-export. The surcharge in effect in 1980 was 60%.

(c) Finland

Finland is not an expanding market for fisheries products and demand and population characteristics are such that total and per capita consumption are expected to show no marked change by 1985. In the case of shellfish a moderate expansion is possible in the next few years, but the market will still remain small. As there is no domestic catch of shellfish in Finland the following data on imports in 1979 indicate the level of consumption.

TABLE 21

Finnish consumption of shellfish, 1979

(tonnes, product weight)

Fresh or frozen		Canned	
Lobster	2	Shrimp	42
Shrimp	174	Crab	3
Other	2	Other	109
		Otherwise packaged	3

Source: Canadian Embassy, Helsinki.

As might be expected Canadian exports to Finland have been nominal: in 1979 shipments totalled four tonnes of canned crab and lobster and frozen lobster meat. In 1976 through 1978 total exports from Canada to Finland were too small to be recorded. An optimistic forecast of potential Canadian exports to Finland in 1985 is 10 tonnes of frozen crab, lobster and shrimp, and canned crab and lobster.

---

[1] Turkey is an associate member of the EC.

d) Switzerland

Despite the fact that Switzerland is an affluent country, the market for shellfish, as for other fisheries products, is small. In 1979 per capita consumption of crustaceans and molluscs, fresh, frozen, dried, salted etc. was 0.5 kilograms, product weight, while that of crustacean and mollusc products and preparations, (whether or not in airtight containers) was 0.2 kilograms. In absolute terms the relevant tonnages were 3 292 tonnes and 1 356 tonnes, product weight, respectively[1]. While per capita consumption has been virtually static in recent years, an increase is expected to occur by 1985 in consumption of shellfish in the fresh, frozen, dried and salted category. When factors such as the estimated growth in population, and in real per capita incomes, are taken into account, aggregate consumption of all shellfish products in Switzerland in 1985 could expand to 6 500 tonnes, or by some 40% compared with the tonnage cosumed in 1979.

As Switzerland does not possess a shellfish fishery and re-exports of shellfish products are minimal (normally not exceeding 100 tonnes) the volume of imports is essentially equal to consumption.

Canadian exports of shellfish products to Switzerland have been growing year by year and in 1979 totalled 97 tonnes as against seven tonnes in 1975, with lobster-in-shell and frozen shrimp the major products. With the expected growth in the consumption of shellfish in Switzerland it is considered that there is scope for continued expansion in Canadian sales of shrimp and lobster products and for the development of a market for crab products. In addition there could be limited export opportunities for oysters and mussels. Projected Canadian sales for shellfish products in Switzerland in 1985 is indicated in Table A-2 of Appendix III.

(e) Norway

Official statistics on Norwegian consumption of shellfish are not available. However the following data on landings, imports and exports provides an impression of both the level of consumption and the import demand.

---

[1] SWITZERLAND Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

TABLE 22

Norwegian imports, exports and landings of shellfish

(tonnes)

	1977	1978	1979
(a) Imports			
Fresh and frozen (product weight)			
Crab	22	38	39
Lobster	43	89	104
Shrimp, frozen	2 958	2 012	4 460
Molluscs, other than oysters	2 115	3 144	4 684
Preserved or prepared, canned			
Crab	87	79	97
Lobster	1	2	5
Shrimp	--	3	--
Preserved or prepared other than canned			
Shrimp, frozen	380	503	303
Shrimp, other	37	55	44
Other crustaceans and molluscs, prepared or preserved	20	10	22
(b) Exports (product weight)			
Fresh and frozen			
Crab	136	88	105
Lobster	100	82	61
Shrimp, frozen	8 089	4 231	3 947
Shrimp, other	1 718	1 257	1 193
Molluscs, except oysters	51	17	134
Preserved or prepared, canned			
Crab	191	174	21
Lobster	--	--	--
Canned	17	12	12
Preserved or prepared other than canned			
Shrimp, frozen	3 647	4 576	5 938
Shrimp, other	362	303	387

TABLE 22 (Cont'd)

	1977	1978	1979
Other crustaceans and molluscs, prepared or preserved	--	2	3
(c) Landings (tonnes, round weight)			
Crab	2 351	2 566	2 721
Lobster	100	70	75
Shrimp	26 439	31 845	34 021

Source: Canadian Embassy, Oslo

It is evident from the foregoing that, if preferences for particular species are ignored, Norway has so far been able to satisfy the demand for shrimp, crab and lobster products from its own resources, a conclusion borne out by the large export trade in these shellfish. However other considerations, including the derived demand from the export trade and of consumer demand for species such as American lobster, which are not harvested in Norway, give rise to an import demand as indicated in Table 26.

By 1985 some growth in shellfish consumption and imports can be expected despite an almost static population. There is the increasing affluence of the Norwegian consumer, as the result of the exploitation of the country's oil resources, and it is anticipated there will be no significant growth in the domestic supply of lobster, crab and shrimp over the next few years.

Canadian exports of shellfish have been growing in recent years and reached 374 tonnes in 1979. Growth has been concentrated in fresh and frozen whole lobsters, frozen shrimp and canned crab. Provided the rigorous Norwegian quality standards are met it is anticipated that the Canadian market potential in Norway for these products will continue to expand. Projections for 1985 are set out in Table A-2 of Appendix III.

(f) Sweden

Sweden is largely dependent upon imports to satisfy the demand for shellfish. In 1978, Swedish landings of shellfish totalled only 1 957 tonnes, of which 1 470 tonnes consisted of shrimp. Catches of shellfish have been declining and a significant reversal of this trend is not expected by 1985.

Swedish consumption of shellfish has been increasing over the long term. Per capita consumption of fresh and frozen shellfish was 1 kilogram per capita (landed weight basis) in 1978 compared with 0.4 kilogram in 1960. In the case of shellfish, preserved or processed, the relevant figures are 0.9 kilograms and 0.3 kilograms respectively, product weight basis. However over the more recent past a downward movement has become evident in the per capita consumption of fresh and frozen shellfish from a peak of 1.4 kilograms landed weight basis, in 1976.[1]

In 1977 Sweden imported some 18 200 tonnes of shellfish, primarily frozen, whole or peeled shrimp, frozen crayfish and canned mussels, and relatively small volumes of lobster and crab products.

There would appear to be considerable potential for Canadian lobster products in Sweden. Canada is already virtually the sole supplier of whole frozen lobster, while substantial volumes of both hot and cold lobster packs have been readily absorbed by the market. Importers in Sweden have expressed an interest in obtaining larger volumes of high quality frozen and canned crab meat and there are prospects for a further increase in Canada's already substantial share of this market. Canadian shipments of northern shrimp to Sweden in recent years have been such as to suggest that a substantial market could be developed provided quality is high and there is no incidence

---

[1] SWEDEN Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1979. Department of Fisheries and Oceans, Ottawa.

of unacceptable "off-flavours." Both IQF, cooked, peeled and whole frozen shrimp are in strong demand. There are also good market prospects for block frozen, whole, cooked shrimp. There is a moderately increasing demand for frozen scallop, which may offer some potential.

6. Southeast Asia

(a) Japan

A steadily expanding gross national product in real terms; a population of over 116 million, which is expanding by close to a million persons per year, and high, rising living standards are positive influences on the consumption of shellfish in Japan. It has been found that such expensive shellfish as shrimp, lobster and crab have high income elasticities of demand[1], which means that consumption expands with the growth of incomes.

Japanese catches of lobster, shrimp, prawn and abalone have shown little growth in recent years[2]. On the other hand the catch of crab[3] and "Mogai" clams has been declining rapidly, while that of short necked clams and the common scallop has been expanding. As for sea urchins, sea cucumbers and other sea animals, overall catches have been increasing. Shellfish cultured in Japan include oysters, scallops and prawns.

Imports of shrimp and prawn, crab, abalone and sea urchins by Japan have increased substantially in recent years as shown in Table 24.

---

1 JAPAN Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

2 1974 to 1978.

3 Particularly king and queen crab.

TABLE 23

Japanese imports of selected shellfish products

	1975	1976	1977	1978
Fresh and frozen				
Shrimp, prawn and lobsters, incl. live	113.8	126.2	128.5	150.0
Crab	10.5	12.5	18.4	31.9
Abalone	0.9	1.6	3.3	2.8
Hard clam	15.8	14.9	12.6	13.4
Salted, dried or smoked				
Sea urchins	1.7	1.9	2.5	2.3
Canned				
Abalone	0.6	0.7	0.8	0.7

Sources: Statistical Yearbook of Ministry of Agriculture, Forestry and Fisheries, 1978-79. Statistical and Information Department, Ministry of Agriculture, Forestry and Fisheries, Japan.

The expansionary trends outlined above continued in 1979. On the other hand Japanese exports of molluscs and crustacea have been following a contrary trend. For instance Japanese exports of fresh and frozen shrimp fell to 1 949 tonnes in 1978 from 2 674 tonnes in 1975, canned crab shipments fell to 20 tonnes from 227 tonnes, while exports of little neck clams declined to 2 245 tonnes from 3 511 tonnes over the period.

These trends in landings, exports, consumption and imports of shellfish products indicate that there is an increasing potential for sales of Canadian shellfish to this market. Japanese demand for imported shrimp and prawn is increasing and the already established Canadian trade with Japan in these products is expected to expand further by 1985. It also appears that there are opportunities for the marketing of consumer packs from Canada. While Canadian snow crab is at a disadvantage on the Japanese market because of its small size, and has to compete with king crab and two species of snow crab from the United States in particular, there is potential for Canadian exporters. Some Japanese imports of snow crab consist of shrink packs of whole crab and

sections, as well as shucked meat. The spiny lobster is the main lobster species consumed in Japan and the American lobster is a new product, which is less preferred because of the claws. However, it appears that there is a slowly expanding market for live lobster in Japan, and as consumers become more accustomed to the American lobster the probability is that a good potential will develop for Canadian products. Although less preferred than the Japanese species, sea urchins, including roes, from Canada can be expected to be in increasing demand. Canadian exports of abalone to Japan will be restricted by lack of resource. It may also be possible to develop a market for Canadian sea cucumbers. The ovary tubes and intestine tubes of sea cucumbers command the largest market, although the rest of the animal can be sold in the dried form.

(b) Hong Kong

The available statistical data[1] on imports of shellfish into Hong Kong indicate an overall rising trend under the stimulus of an expanding aggregate demand for domestic consumption and for re-export to other countries. When fresh, frozen and dried squid is excluded, imports of shellfish into Hong Kong totalled 30 867 tonnes in 1979, as follows: fresh or frozen shellfish, 23 602 tonnes; dried and salted, 5 383 tonnes; canned 1 880 tonnes; and prepared two tonnes.

There is a developing demand in Hong Kong for Canadian clams, lobster in shell and to a lesser extent for frozen scallops. In addition it is expected that demand will continue to grow for Canadian shrimp and canned abalone. Hong Kong buyers are also interested in clams, mussels, crab, oysters and sea snails. However, Canadian shellfish products must compete with similar exports from other countries in a market which is very price and quality conscious.

---

[1] HONG KONG Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

7. Australasia

(a) New Zealand

After reaching a peak of 2.3 kilograms per capita (edible weight), in 1971 and 1972, per capita consumption of shellfish products[1] in New Zealand has since fluctuated within a range of 0.8 kilograms and 1.1 kilograms. There is no evidence to suggest an upward trend by 1985, and forecast consumption for that year has been estimated at one kilogram. Aggregate consumption of shellfish products in New Zealand was some 3 400 tonnes, edible weight, in 1976 and may be only about 3 200 tonnes in 1985, if expectations of lower per capita demand and population growth near zero are realized[2].

Landings of the shellfish species covered by this report have tended to reflect the fluctuations of a fully exploited resource.

TABLE 24

New Zealand landings of shellfish species

(tonnes, landed weight)

	1976	1977	1978
Rock lobster	3 702	3 539	3 718
Oysters	10 007	10 765	9 838
Mussels	2 249	653	704
Paua	562	768	567
Scallops	6 131	1 293	3 166
Other, excluding squid	277	332	374

NEW ZEALAND Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

---

[1] Excludes canned, prepared or preserved.

[2] Consumption of canned, prepared and preserved fisheries products, which includes shellfish, may remain at the 1976 level of 3 200 tonnes in 1985.

Shellfish stocks other than squid are increasingly being placed under control in New Zealand and no long term growth in landings of rock lobster, scallops, oysters and paua are forecast for 1985.

New Zealand imports of shellfish products for the 12 month period ending 30 June 1976 through 1978 are tabulated in Table 26. While it is probable that imports of certain shellfish products such as canned crab and shrimp will increase in the coming years, the market potential for Canadian products is considered poor because of competition from lower cost producers. The market is dominated by developing countries such as Thailand, Malaysia and Pakistan, and the US. Australia is also becoming an important supplier. Canada's share of the market over the period 1975-76 to 1977-78 has been negligible and no significant change is expected by 1985.

(b) Australia

Australia harvests a variety of species, as shown in Table 27. On the basis of the trend in landings since 1970 it would appear that with the possible exception of northern prawns there is little prospect of significant growth in landings of shellfish by 1985.

Shellfish comprise the major marine products exported by Australia and consist primarily of prawns, rock lobster, abalone and to a lesser degree scallops and oysters. Shipments of oysters have increased, but the level of exports of the other shellfish products has remained relatively stable since 1970.

TABLE 25

New Zealand imports of shellfish products

(tonnes, product weight)

	1975/76	1976/77	1977/78
Fresh or frozen:			
Packed for retail sale	4.1	2.3	0.2
Otherwise packed	8.1	19.2	16.0
Salted, in brine or dried	2.3	1.9	2.1
Crustaceans in shell, boiled in water	24.5	13.6	9.7
Prepared:			
Pastes	0.7	0.6	1.7
Other kinds	78.4	62.3	127.3
Preserved:			
In airtight cans or jars	295.6	345.5	250.1
Otherwise packed	298.9	481.3	296.7

Source: NEW ZEALAND Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985. Department of of Fisheries and Ocenas, Ottawa.

TABLE 26

Australian catches of shellfish species

(tonnes, live weight)

	1975/76[1]	1976/77[1]	1977/78[1]
Crustaceans:			
Prawns	19 478	23 039	19 166
Rock lobster	12 865	12 700	14 588
Crab	700	821	854
Freshwater crayfish	131	83	33
Molluscs:			
Oysters	10 273	10 793	9 774
Scallops	4 642	4 431	9 307
Abalone	5 256	6 320	5 057
Other	1 648	998	1 379

[1] Year ended 30 June.

Source: AUSTRALIA Annex to the Worldwide Fisheries Marketing Study: Prospects to 1985. Department of Fisheries and Oceans, Ottawa.

Notwithstanding substantial domestic resources and an export surplus, Australia imports a considerable tonnage of shellfish products, as detailed in Table 28. According to official statistics the apparent

consumption of edible fresh and frozen shellfish in Australia in 1977/78 was 0.9 kilograms[1]. The Australian consumer is becoming increasingly affluent, and per capita income now parallels that of northwestern European countries. This fact, together with a population growth of 1.3%, indicates that there should be a growing demand for shellfish products. However, at this juncture, there does not appear to be parallèl prospects for Canadian exports to this market. Imports in large measure consist of prawns or prawn meat from low cost exporters such as India, Malaysia and Thailand. Other crustaceans and molluscs are imported primarily to satisfy a seasonal demand, which is usually supplied by Cuban rock lobster and New Zealand scallops for instance. There is an evident trend toward the export of the more valuable shellfish products and the importation of the lower priced species such as shrimp and prawns. This suggests increased potential for Canadian exports of the less valuable species such as mussels. As for the luxury species (scallops, lobster, and crab) a modest expansion in Canadian exports from the average of recent years is possible. This potential is quantified in Table 2 of Appendix III.

8. Other World Markets

A number of other countries were the subject of on the spot surveys by study teams as part of the Worldwide Fisheries Marketing Study. These countries, which are tabulated below, are not considered to offer significant potential as markets for Canadian shellfish products over the next five years.

Argentina
Austria
Barbados
Brazil
Czechoslovakia
Egypt
Guyana
Hong Kong
Ivory Coast
South Korea
Kuwait
Nigeria
Poland
Puerto Rico
Saudi Arabia
Singapore
Taiwan
Trinidad
Uruguay
Venezuela

[1]Canned and other shellfish products are included in the consumption of other seafood products, other than fresh and frozen, which in 1977/78 was 2.8 kilograms. It is estimated that consumption of such shellfish products is of the order of 0.5 kilograms.

TABLE 27

Australian imports of shellfish products

(tonnes)

	1975/76[1]	1976/77[1]	1977/78[1]
Fresh or frozen:			
Prawn and shrimp	1 330	616	504
Other shellfish	885	1 371	953
Boiled:			
Lobster	220	328	165
Other crustaceans	139	141	105
Prepared or preserved:			
Salted shellfish	116	95	187
Dried shellfish	17	33	55
Canned:			
Shrimp and prawn	297	428	570
Crab	127	225	224
Oysters	184	172	186
Other shellfish	821	1 222	1 277
Potted or concentrated:			
Shellfish	16	48	35
Other prepared or preserved:			
Shellfish	4 028	4 656	3 524

[1]Year ended 30 June.

Source: AUSTRALIA Annex to Worldwide Fisheries Marketing Study: Prospect to 1985, November 1980. Department of Fisheries and Oceans, Ottawa.

C. SUMMARY AND CONCLUSION

1. Preliminary data indicate that in 1980 Canadian fishermen landed slightly more than 150 600 tonnes (round weight) of the major shellfish species dealt with in this report. Projections to 1985 suggest that landings could increase to 162 000 tonnes.

2. The major markets for Canadian shellfish are in foreign countries. In 1979, Canadians consumed 22 049 tonnes (edible weight) of shellfish, and of this total 18 130 tonnes (product weight) was imported.

3. In 1979, Canada exported 32 277 tonnes (product weight) of the major species to 35 countries. The breakdown by species: lobster products, 12 800 tonnes; scallops, 9 032 tonnes; crab, 4 075 tonnes, and clam products, 2 456 tonnes.

4. The major markets for Canadian shellfish are the United States; countries of the European Economic Community (EC) notably France, the United Kingdom, Belgium, the Netherlands, West Germany and Denmark; and Sweden, Norway and Japan. In the aggregate, these countries accounted for about 99% of Canadian exports, with the US being the largest single market for all but shrimp among the products examined.

5. World landings of shellfish species significant to Canada continue to expand, albeit at a relatively slow rate. According to available data, world catches of selected species increased from an aggregate 4 657 000 tonnes (round weight) in 1975 to 5 486 00 tonnes in 1978. Canadian landings have also been increasing in respect of some species, notably shrimp, crab and clams. On the other hand, catches of lobster and oysters have remained relatively stable, while landings of scallops are in a sharp decline.

6. As for the Canadian market for shellfish, an examination of various factors would appear to indicate little prospect of significant growth in per capita consumption, but growth in overall consumption

between 1979 and 1985 could reach 12% to 15%. Much will depend on the degree to which Canadian products are competitive with imports in terms of price, quality, consumer acceptability, and availability. Based on past trends, however, it would appear that opportunities for import substitution are limited, and indications are that the larger part of the Canadian market for shellfish will continue to be satisfied by imports through 1985.

7. The above indicates clearly that the Canadian industry will have to rely heavily on export sales. Relative to 1975, the 1979 export tonnage of all the major species was sharply increased, even for scallops, in spite of a declining trend due largely to reduced catches. An assessment of the market potential for Canadian shellfish products in 41 countries indicates that, on balance, there are strong prospects for continued expansion of exports to the mid-1980s.

APPENDICES

APPENDIX I

TABLE A-I
Statistical tables - world landings of selected shellfish species
World landings of lobsters
(000 tonnes, round weight)

Year	American lobster	European lobster	Norway lobster	Rock lobster	Spiny lobster	Other	Total
1970	32.1	2.2	35.4	21.7	37.9	40.6	169.9
1971	32.6	2.3	36.3	18.3	47.8	37.6	174.9
1972	29.6	2.0	41.3	17.6	53.1	33.3	176.9
1973	29.2	1.9	41.1	17.5	47.6	25.5	162.8
1974	27.1	1.9	37.1	17.0	49.4	27.6	160.1
1975	31.2	1.8	40.7	14.4	47.9	36.1	172.1
1976	30.4	1.9	42.7	13.5	52.5	62.8	203.8
1977	32.2	1.9	44.0	13.9	49.1	43.6	184.7
1978	33.1	1.8	44.8	14.0	56.7	41.3	191.7

Source: FAO, Yearbook of Fisheries Statistics, Rome, Italy
Vol. 46, 1978.
Vol. 42, 1976.
Vol. 40, 1975.

TABLE A-2
World landings of crab
(000 tonnes)

Year	King crab	Snow crab	Blue crab	Dungeness crab	Edible crab	Gazami crab	Other	Total
1970	72.8	67.6	68.0	27.6	21.3	3.7	101.3	362.3
1971	68.8	55.0	69.5	19.8	23.5	5.2	108.0	349.8
1972	70.6	69.6	69.2	13.6	23.8	7.2	110.2	364.2
1973	60.1	74.6	65.5	7.6	19.7	12.4	141.9	381.8
1974	68.0	73.5	69.8	8.4	19.4	14.0	164.0	416.1
1975	62.0	52.1	66.9	9.5	21.3	17.9	149.3	379.0
1976	68.8	68.6	55.8	17.2	25.0	14.3	148.9	398.6
1977	62.0	79.2	64.6	28.4	21.9	19.7	166.8	442.6
1978	77.1	104.5	68.7	19.0	25.1	20.2	179.0	493.6

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy
Vol. 46, 1978.
Vol. 42, 1976.
Vol. 40, 1975.

APPENDIX I

TABLE A-3

World landings of scallops

(000 tonnes, round weight)

Year	Sea	Calico	Bay	Common and queen	Other	Total
1970	71.4	10.4	5.8	19.4	37.6	144.6
1971	62.2	11.2	8.3	31.9	43.5	157.1
1972	70.0	10.0	7.0	36.8	61.6	185.4
1973	64.7	4.2	3.5	55.6	72.7	200.7
1974	77.5	4.6	6.7	42.7	99.5	231.0
1975	103.7	19.8	5.5	42.6	119.7	291.3
1976	169.6	22.8	6.9	49.5	114.3	363.1
1977	211.8	11.0	5.9	38.9	138.9	406.5
1978	231.6	9.5	4.1	42.1	143.9	431.2

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy Vol. 46, 1978. Vol. 42, 1976. Vol. 40, 1975.

TABLE A-4

World landings of northern shrimp[1]

(000 tonnes, round weight)

Year	
1970	145.2
1971	137.9
1972	130.1
1973	153.0
1974	170.8
1975	180.5
1976	211.2
1977	216.0

[1]Pandalus Borealis, Crangon Crangon and other Pandalus species.

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy Vol. 44, 1977. Vol. 42, 1976.

APPENDIX I

TABLE A-5

World landings of oysters

(000 tonnes, round weight)

Year	Cupped				Flat		
	Pacific	American	Portuguese	Other	European	Other	Total
1970	281.1	336.7	44.4	17.7	21.3	11.0	712.2
1971	295.3	359.3	27.6	18.8	16.5	11.6	729.1
1972	341.2	323.9	63.5	20.4	18.3	8.8	776.1
1973	368.8	316.7	63.3	19.1	14.6	10.9	793.4
1974	307.2	286.6	60.1	18.0	18.2	10.0	700.1
1975	393.0	326.7	85.4	19.6	12.6	10.3	847.6
1976	432.6	344.0	85.9	22.0	9.1	10.9	904.5
1977	415.2	283.8	105.0	31.6	11.5	12.6	859.7
1978	432.0	325.4	91.8	32.2	6.5	11.9	899.8

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy. Vol. 46, 1978. Vol. 42, 1976. Vol. 40, 1975.

TABLE A-6

World landings of clams

(000 tonnes, round weight)

Year	Quantity
1970	718.2
1971	659.3
1972	683.4
1973	685.0
1974	764.5
1975	711.3
1976	775.4
1977	844.7
1978	832.7

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy. Vol. 46, 1978. Vol. 42, 1976. Vol. 40, 1975.

APPENDIX II

TABLE B-1

Domestic market forecast for Canadian shellfish, 1985

(tonnes, product weight)

Product category	1979[1]	1985	
	Total market	Potential market	Potential supply from Canadian sources
Lobster			
In shell, fresh or frozen	4 244	5 100	3 500
Meat, fresh or frozen	1 974	2 000	600
Canned	240	200	200
Crab			
Whole, fresh or frozen	1 413	2 000	300
Meat, fresh or frozen	3 315	4 000	650
Canned	142	400	250
Scallops			
Shucked, fresh or frozen	2 381	1 600	1 600
Shrimp			
In shell, fresh or frozen	474	600	50
Peeled, fresh or frozen	8 628	9 000	800
Canned	1 214	1 000	--
Oysters			
In shell, fresh or frozen	1 444	1 500	1 300
Meat, fresh or frozen	645	700	220
Canned	879	1 200	--
Clams			
In shell, fresh or frozen	1 262	1 300	1 000
Meat, fresh or frozen	595	600	270
Canned	2 819	2 800	950

[1]Preliminary. These figures differ to some extent from those shown in Table 7, because of the manner of classification of import data.

Source: Department of Fisheries and Oceans, Ottawa and MSB estimates.

APPENDIX III

TABLE C-I

Export forecast for Canadian shellfish by product[1], 1985

(tonnes, product weight)

	1976	1977	1978	1979	1985
Lobster:					
In shell, fresh or frozen	7 326	7 532	7 920	10 782	16 278
Meat, fresh or frozen	1 316	1 414	1 523	1 673	1 571
Canned	178	195	349	282	293
Crabs:					
Fresh or frozen	1 215	1 272	2 362	2 445	2 695
Canned	686	935	1 202	1 625	1 861
Scallops:					
Fresh or chilled	1 110	1 755	943	240	104
Frozen	8 190	10 632	10 644	8 768	5 796
Shrimp and Prawn:					
Fresh or frozen	1 757	1 941	2 063	3 849	6 268
Clams:					
Fresh or frozen	744	1 400	1 699	2 456	3 729
Total	22 522	27 076	28 705	32 120	38 595

[1]Excludes squid and shellfish and products N.E.S.

Source: Statistics Canada, Exports by Commodities cat. 65-007 December, 1979 Ottawa and MSB estimates.

APPENDIX III

TABLE C-II

Export forecast for Canadian shellfish by market, 1985

Lobster in shell, fresh or frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	6 648	6 263	5 742	7 426	10 500
United Kingdom	54	66	130	166	241
France	163	210	583	1 097	1 689
Belgium-Luxembourg	152	190	441	944	600
Netherlands	142	221	377	453	2 000
West Germany	94	131	209	256	400
Denmark	4	15	25	101	150
Italy	--	--	--	1	20
Greece	--	--	--	--	--
Ireland	--	--	--	--	--
Spain	--	--	--	17	25
Portugal	--	0	--	--	--
Finland	0	0	0	0	1
Switzerland	1	3	10	29	47
Sweden	55	73	169	190	220
Japan	13	336	194	39	300
Hong Kong	--	24	3	4	5
Norway	0	0	37	59	80
New Zealand	--	--	--	--	--
Australia	--	--	--	--	--
Total	7 326	7 532	7 920	10 782	16 278

[1]Commodity classification 46-24.

Source: IBID.

APPENDIX III

TABLE C-III

Lobster meat, fresh or frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	1 183	1 267	1 317	1 036	800
United Kingdom	52	36	46	92	102
France	11	7	80	339	450
Belgium-Luxembourg	10	26	9	52	50
Netherlands	8	5	13	17	15
West Germany	7	5	6	41	50
Denmark	3	4	0	11	15
Greece	--	--	--	0	1
Finland	--	--	--	1	1
Switzerland	17	--	--	1	5
Sweden	20	22	29	77	40
Japan	5	41	23	--	40
Hong Kong	--	1	--	2	2
Norway	--	--	--	4	--
Total	1 316	1 414	1 523	1 673	1 571

[1]Commodity classification 46-26 and 46-27.

Source: IBID.

APPENDIX III

TABLE C-IV

Lobster, canned[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	60	41	148	114	85
United Kingdom	34	9	49	30	20
France	0	32	61	42	55
Belgium-Luxembourg	8	5	42	15	20
Netherlands	20	28	21	16	30
West Germany	41	51	17	34	50
Denmark	1	1	3	1	1
Finland	0	0	0	1	2
Switzerland	--	0	0	0	2
Sweden	14	19	7	25	20
Japan	--	9	--	--	5
Norway	--	--	--	1	1
New Zealand	--	--	--	2	--
Australia	--	--	1	1	2
Total	178	195	349	282	293

[1]Commodity classification 46-80.

Source: IBID.

APPENDIX III

TABLE C-V

Crab fresh of frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	652	480	1 635	1 128	900
United Kingdom	31	38	31	122	152
France	149	266	220	432	470
Belgium-Luxembourg	184	294	240	356	500
Netherlands	15	4	85	186	200
West Germany	18	3	16	12	20
Denmark	4	20	17	8	15
Greece	--	--	--	4	5
Spain	--	--	--	1	--
Finland	--	--	--	--	1
Switzerland	--	--	1	--	2
Sweden	146	136	99	109	200
Japan	5	11	2	64	200
Hong Kong	0	1	1	--	--
Norway	4	6	1	7	10
New Zealand	5	--	--	1	0
Australia	2	13	14	15	20
Total	1 215	1 272	2 362	2 445	2 695

[1]Commodity classification 46-20.

Source: IBID.

APPENDIX III

TABLE C-VI

Crab canned[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	65	90	135	140	200
United Kingdom	112	105	176	187	229
France	297	460	619	735	816
Belgium-Luxembourg	24	54	65	87	100
Netherlands	53	73	78	144	150
West Germany	11	19	17	23	30
Denmark	9	6	4	13	15
Italy	--	1	--	--	3
Greece	--	--	1	--	1
Spain	--	3	--	--	--
Finland	--	--	--	2	5
Switzerland	--	--	--	1	2
Sweden	104	104	33	160	130
Japan	--	7	25	4	25
Hong Kong	--	--	2	--	--
Norway	11	13	44	71	80
Australia	--	--	3	58	75
Total	686	935	1 202	1 625	1 861

[1]Commodity classification 46-76.

Source: IBID.

APPENDIX III

TABLE C-VII

Scallops fresh or chilled[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	1 110	1 755	940	240	100
United Kingdom	--	--	--	--	--
France	--	--	3	--	4
Belgium-Luxembourg	--	--	--	--	--
Netherlands	--	--	--	--	--
West Germany	--	--	--	--	--
Denmark	--	--	--	--	--
Italy	--	--	--	--	--
Greece	--	--	--	--	--
Ireland	--	--	--	--	--
Spain	--	--	--	--	--
Portugal	--	--	--	--	--
Finland	--	--	--	--	--
Switzerland	--	--	--	--	--
Sweden	--	--	--	--	--
Japan	--	--	--	--	--
Hong Kong	--	--	--	--	--
Norway	--	--	--	--	--
New Zealand	--	--	--	--	--
Australia	--	--	--	--	--
Total	1 110	1 755	943	240	104

[1]Commodity classification 46-41.

Source: IBID.

APPENDIX III

TABLE C-VIII

Scallops, frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	8 149	10 266	10 297	8 536	5 448
United Kingdom	--	11	4	2	1
France	15	124	314	134	193
Belgium-Luxembourg	--	2	--	2	5
Netherlands	--	--	1	--	2
West Germany	9	15	19	73	20
Denmark	--	2	2	2	2
Italy	--	--	--	--	--
Greece	--	--	--	--	--
Ireland	--	--	--	--	--
Spain	--	--	--	--	--
Portugal	--	--	--	--	--
Finland	--	--	--	--	--
Switzerland	0	--	--	5	5
Sweden	--	3	7	--	20
Japan	--	10	--	--	--
Hong Kong	2	1	--	--	--
Norway	--	--	0	--	--
New Zealand	--	--	--	--	0
Australia	15	198	0	14	100
Total	8 190	10 632	10 644	8 768	5 796

[1]Commodity classification 46-43.

Source: IBID.

APPENDIX III

TABLE C-IX

Shrimp and prawns fresh or frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	782	615	530	669	700
United Kingdom	479	479	499	941	1 261
France	--	--	1	456	1 860
Belgium-Luxembourg	--	--	--	--	10
Netherlands	54	35	32	31	100
West Germany	118	284	440	198	200
Denmark	6	--	6	370	300
Italy	--	--	--	16	150
Greece	--	--	--	1	2
Switzerland	12	44	62	61	85
Sweden	262	94	14	440	750
Japan	13	225	326	390	600
Hong Kong	14	10	19	34	35
Norway	15	155	134	232	200
New Zealand	2	--	--	--	--
Australia	--	--	--	10	15
Total	1 757	1 941	2 063	3 849	6 268

[1]Commodity classification 46-49.

Source: IBID.

APPENDIX III

TABLE C-X

Clams fresh or frozen[1]

(tonnes, product weight)

Country	1976	1977	1978	1979	1985
United States	741	1 375	1 647	2 022	2 600
United Kingdom	--	--	--	26	119
France	--	12	--	7	--
Belgium-Luxembourg	--	--	--	18	50
Netherlands	--	--	--	--	30
Denmark	--	--	--	7	--
Italy	--	--	18	37	50
Spain	--	--	1	7	300
Sweden	--	--	5	--	50
Japan	3	13	28	307	500
Hong Kong	--	--	--	25	30
Total	744	1 400	1 699	2 456	3 729

[1]Commodity classification 46-12.

Source: Statistics Canada, Exports by Commodities, Cat. No. 65-004 December 1976-79, Ottawa.