ANNEX TO THE WORLDWIDE FISHERIES MARKETING STUDY: PROSPECTS TO 1985

HERRING

REVISED 1982

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).

DRAFT

Annex to the
Worldwide Fisheries Marketing Study:
Prospects to 1985

HERRING

Author
P.M. Jangaard
Department of Fisheries and Oceans
D.B. McEachern
Department of Fisheries & Oceans

July, 1982.

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
November, 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

HERRING

Table of Contents

A. INTRODUCTION

Canadian herring exporters encountered difficulties in 1980, and by the spring of 1981, there had not been much improvement in the marketing situation with high inventories of frozen fillets keeping prices depressed. Even after inventories were cleared, prices have not recovered by the summer of 1982 due to plentiful supplies of fresh fillets available from European suppliers, the relatively high value of the dollar and reduced consumer demand caused by the economic recession.

The outlook for Canadian herring exports, especially of frozen fillets, to traditional markets is therefore not bright for the next few years. Consumption is down in the most important market, West Germany, and the European supply situation is steadily improving. Herring quotas for EEC countries increased from 145 000 tonnes in 1981 to 199 000 tonnes in 1982 and quotas in other European countries are also on the increase.

Markets for large size frozen fillets and for cured and canned herring products are currently holding up fairly well. However, Norwegian stocks of large herring are recovering, and these have already affected the markets for barreled herring supplied by Canada and Iceland over the past five years.

Experience of the past two years underlines the point that Canadian suppliers can no longer simply pay lip service to the maintenance of quality standards, and that a genuine effort must be made by fishermen, processors and government to ensure that herring products shipped from Canada are of top quality and as described in the specifications. Agressive marketing initiatives will be necessary to maintain current markets and to develop new ones over the next few years.

Table 1

CANADIAN HERRING DOMESTIC AND EXPORT SALES FORECAST, 1985

tonnes

	Fresh, Whole or Dressed	Frozen, Whole or Dressed	Frozen Fillets	Smoked	Vinegar Cured Fillets Whole or Dressed	Pickled Split or Fillets	Spice-, Sugar-Cured Pickled Whole or Dressed	Canned	Sardines	Roe	TOTAL	Meal	Oil
Canada	500			200	600			2 700	5 000		9 000		
US	15 000	1 000	500	500	4 000	4 000	1 000	2 000	2 000		30 000	9 000	
W Germany		5 000	15 000		3 000	300	1 000				24 300		
Japan		10 000	500							3 300	13 800		
Netherlands		300	500			100	100				1 000		
United Kingdom		500	1 000				200	300			2 000	1 000	
France		200	500				300				1 000		
Belgium/ Luxemburg		200	500								700		
Sweden						1 000	1 500				2 500		
Denmark											---		
Norway											---		
Finland							1 000				1 000		
S.Korea		500									500		
Caribbean Countries				3 000					3 000		6 000		
Australia New Zealand								500	1 500		2 000		
Others		200	500	200	200	300	200	500	500		2 600		
Product wt.	15 500	17 900	19 000	3 900	7 800	5 700	5 300	6 000	12 000	3 300	96 400	10 000	3 500
Conversion factors	1	1	2.1	2.2	2.3	2.3	1.4	1.6	2.5	9.1			
Landed wt.	15 500	17 900	39 900	8 580	17 940	13 110	7 420	9 600	30 000	30 000	189 950		

Assumptions for Table 1

Canada - Atlantic coast landings will remain at about 150 000 tonnes (± 20 000 tonnes).

- Pacific coast landings will be used chiefly for roe production except for a limited quantity being frozen round for food or bait.

USA - East coast herring landings will remain at current levels for the near future.

- The US will not develop a curing industry for the domestic market but will continue to produce mainly frozen fillets and canned products.

Europe - European supply of legally and illegally caught herring will continue to increase.

Sweden/Finland - Canada can hold some of the market for cured herring in spite of increasing competition from Norway and Iceland.

B. SUPPLY AND DEMAND

The total world supply of Atlantic and Pacific herring has not changed very much over the past three years, with a slow recovery evident since 1978-1979 (Appendix II, Table 1).

Canadian east coast landings declined in 1979 to 187 900 tonnes, in 1980 to 176 000 and in 1981 to 160 000 tonnes from the 210 000-240 000 tonne range of recent years. Since quotas are lower in most areas for 1982, a further decline is anticipated. Unless recruitment improves in the Gulf of St. Lawrence and Newfoundland stocks, no increase in landings is expected over the next few years.

Canadian west coast landings declined from 81 553 tonnes in 1978 to 43 500 tonnes in 1979 and to 25 155 tonnes in 1980 and rebounded to about 40 000 tonnes in 1981. Total allowable catches are expected to be in the 30-40 000 tonne range in the near future.

United States east coast landings increased to 65 000 tonnes in 1979 from the 50 000-tonne level in the three years before, to nearly 83 000 tonnes in 1980 and declined to 64 000 tonnes in 1981. Of the 1981 landings, about 40 000 tonnes were two-year old juvenile herring used for sardines. The Gulf of Maine stock situation is excellent with several good year classes in the fishery (1976, 1977, 1979).

Norwegian fishermen caught 24 3000 tonnes of herring in 1981 as compared to 17 100 in 1980 and 10 300 in 1979. The Atlanto-Scandia stock is recovering, and a steady, but slow increase in total allowable catches can be expected in coming years.

The southern North Sea and waters west of Scotland was opened for herring fishing again in 1981 (20 000 and 60 000 tonnes respectively). Stock recovering in the central North Sea is very slow, probably due to large catches of juveniles as "sprats" and other illegal "bycatches". For 1982, the TAC for the area west of Scotland was increased to 70 000 tonnes and the southern North Sea to 60 000 tonnes.

Fresh herring for the West German processing plants has chiefly come from the Kattegat-Skagerrak areas between Denmark and Norway-Sweden in recent years. The TAC for 1980 was 50 000 tonnes, but biologists estimate that the actual catch was approximately 90 000 tonnes. Stock recovery prospects are therefore uncertain

Catches in the waters around Ireland were about 40 000 tonnes in 1980 although the TAC was only 23 000 tonnes. TAC's for 1981 and 1982 are even lower.

Catches of Baltic herring totalled about 450 000 tonnes in 1980 against a recommended TAC of 374 000. The recommended TAC for 1982 is 365 000 tonnes.

Landings from the Icelandic summer spawning stock decreased from 53 000 tonnes in 1980 to 39 200 in 1981 and are not expected to increase much past 60 000 tonnes in the near future.

Pacific herring landings have increased somewhat since the bottom was reached in 1978 mainly due to increased US landings in Alaska.

The demand for herring has been decreasing in most of the large herring consuming countries for reasons such as high costs, substitution with other species, changing food habits etc. It is therefore likely that there will be a surplus of herring in Canada in 1985 unless new markets are developed, for instance in Eastern Europe.

C. CANADIAN EXPORT POTENTIAL

1. General

Exports of Canadian herring products for the years 1978 to 1981 are shown in Table 2. From a peak of 172 000 tonnes in 1977, exports declined to a low of 95 600 tonnes in 1980 before increasing to 117 600 tonnes in 1981.

The largest decline has been in the export of fresh herring to the United States due to shortages of sardine sized herring in Southern New Brunswick and liberal supplies in Maine. There has also been a 47% drop in frozen fillet exports since 1977, and smaller declines in most pickled products. Mainly due to an improved supply situation in Europe and a slow decline in consumption.

In order to be able to market the total herring landings expected by 1985, potential new markets must be sought and developed and the decline in exports to current markets halted.

The United States is the largest market for Canadian herring products and a slight expansion is projected by 1985. Japan is also potentially a good market, especially for round frozen herring. Australia and New Zealand are expanding markets especially for canned herring and sardines, and the Carribean should continue to take the bulk of the smoked herring production. Eastern Europe could be a large potential market, but must be developed through government to government negotiations. The continued increase in European herring landings, will make it difficult to stem the decline in Canadian exports to EEC and EFTA countries. Improved quality and grading, a thorough knowledge of the markets and their trading practices and a favorable currency exchange, should enable Canadian exporters to slow the decline and to maintain a strong presence for years to come.

The current situation and market potential in major herring importing countries will be discussed below.

TABLE 2
Canadian herring exports, 1978-81
(Q: tonnes, product weight; V: $'000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Fresh, whole or dressed	26 931	6 982	11 777	2 308	5 542	1 159	11 573	4 071
Frozen, whole or dressed	23 669	20 194	27 761	23 212	14 413	14 863	34 417	26 638
Frozen, fillets	37 461	49 275	25 393	31 819	26 060	36 066	21 700	21 463
Smoked	3 037	3 853	3 458	5 521	3 738	6 256	5 107	8 448
Vinegar-cured, fillets	8 643	10 683	7 910	10 973	5 394	8 157	5 191	7 783
Vinegar-cured, whole or dressed	1 144*	1 361	1 339	1 641	995	1 377	1 142	1 477
Pickled, fillets	6 460	7 978	4 363	6 088	5 325	7 963	4 355	6 010
Pickled, split	1 400	1 272	1 616	1 324	614	779	740	951
Pickled, whole or dressed	7 577	6 695	8 045	7 463	7 819	8 152	6 878	7 443
Canned	3 553	7 738	2 835	8 285	3 082	10 501	3 741	12 857
Sardines	4 174	10 441	5 819	15 652	6 755	18 636	5 463	18 807
	124 049	126 472	100 316	114 286	79 737	113 909	100 307	115 948
Herring roe	9 295	116 242	6 730	169 661	3 009	37 879	5 458	76 836
Herring meal	11 848	5 636	7 054	3 621	8 086	4 666	7 597	4 632
Herring oil	3 679	1 785	6 274	1 716	4 724	2 841	4 196	1 895
Subtotal	24 822	123 663	20 058	174 998	15 819	45 386	17 251	83 363
Grand total	148 871	250 135	120 374	289 284	95 556	159 295	117 558	199 311

* Value considered to be too high, may be revised by Statistics Canada.

Source: Statistics Canada, Exports by Commodity, Ottawa.

2. The United States

Herring Consumption

The US is one of the major world markets for herring products. The largest demand is for canned sardines, amounting to more than 36 000 tonnes product weight in 1979. Other significant items are canned, pickled and smoked herring products. Total US consumption in product weight was 50 000 tonnes from 1977 to 1979, and is projected to attain a level of nearly 54 000 tonnes by 1985 (Table 3).

TABLE 3

Consumption of herring products, 1977-79 and 1985 (projected)

('000' tonnes, product weight)

	1977	1978	1979	1985
Fresh/frozen	2	2	2	2
Sardine	33	33	36	37
Canned	5	3	3	4
Pickled	9	11	8	10
Smoked	1	1	1	1
Total	50	50	50	54

Americans are heavy consumers of both domestically produced sardines and imports. Fish dealers agree that sardines are popular in two overlapping market segments: the ethnic populations, primarily European, and as snack items in the middle to high income market. The demand among ethnic groups may be in a slow

decline as younger generations replace the older population, whereas demand from the higher income segment is growing slowly as living standards increase. The result is a steady, or a very slight decline, in per capita consumption, but total consumption of sardines is increasing and by 1985 should reach 37 000 tonnes product weight.

Similar consumption patterns are demonstrated for other products including canned, pickled and smoked herring. The largest item in the other category is pickled herring being imported primarily from the Canadian Atlantic coast for further processing[1]. This herring is packed in 100 kilogram barrels and imported into the US by about a dozen large producers of jarred and pailed pickled herring. Examples of products are herring fillets in cream sauce, fillets in wine sauce (or miltz) fillet schmaltz herring, herring salad, rollmops and Bismarck herring, packed in various sized containers for the institutional and retail trade. Selling of vinegar-cured herring has changed somewhat in recent years, and is now divided between three or four companies, resulting in wider distribution. Vinegar-cured herring is imported with a preliminary cure (American and salt cure) but then altered and added to by US processors according to as many as 15 different formulae or cures, to meet the special tastes of consumers. These formulae were developed years ago according to recipes from East Europeans, West Germans and Scandinavians. The markets for these products are fairly contained in each area and are delicacy oriented so that they are probably sensitive to general economic conditions such as recessions or boom periods.

Most people in the trade hold that per capita consumption of pickled herring is not expanding but perhaps declining at a very slow pace. By 1985 it is projected that nearly 10 000 tonnes product weight will be consumed. Smoked products, including kippers, are consumed by the institutional trade including

---

1 There is also small-scale production of fully processed pickled and smoked products on the west coast of Canada, some of which is exported into the western US.

restaurants, hotels and clubs and are retailed in cello packages in stores, delicatessens and fish shops. Kippers are generally split or boneless in the form of butterfly fillets. Pickled herring processors are usually also smokers. This trade may be declining somewhat, but some feel it is making a comeback.

Consumption of smoked and other canned herring, along with fresh frozen is projected to 1985 based on the average per capita figures from 1977 to 1979 (Table 3). Consumption of these products is also largely related to ethnic populations.

Exports

Exports of herring from the US originate almost entirely from domestic landings. Nearly all of the Pacific catch has been exported to Japan for the herring roe market and for dried herring as a byproduct. This trade is expected to continue, due to the highly lucrative returns from the roe market in Japan. If Alaskan landings expand in the future it will be in response to high roe prices and/or food herring prices in Japan.

Atlantic herring landings, composed of fish too large for the sardine industry (primarily in the State of Maine) are frozen round or filleted and exported to Europe. There are also some quantities exported fresh to New Brunswick sardine processors. Small quantities of herring on both coasts are used for bait in the halibut, swordfish, and lobster fisheries.

Landings

US herring landings have expanded in recent years on both coasts to more than 122 000 tonnes in 1980 (Table 4) compared to only 26 000 tonnes in 1973. Atlantic Coast landings declined in 1981, chiefly because of the depressed market for frozen fillets.

The major Pacific Coast fisheries take place in Bristol Bay, off south east Alaska, and from California to Washington. The Bristol Bay and south eastern Alaskan fisheries show potential for expansion, but US biologists have made a conservative projection of only 29 000 tonnes of landings for all of the Pacific in future years. Actual landings in 1980 were 40 000 tonnes, despite the low projections.

On the Atlantic coast, 1979 and 1980 landings were unusually high due to the appearance of strong 1976 and 1977 yearclasses. The 1979 yearclass is also very good. The long term projection for Atlantic landings is for 20 000 tonnes of juvenile herring (sardines) and 25 000 tonnes of adult herring. Virtually all of these landings are taken from Gulf of Maine - Jeffreys Ledge stocks by weirs, purse seines, stop seines and pair trawls. There hasn't been a herring fishery on Georges Bank since foreign fishermen stopped fishing there in 1976, and although those waters have been surveyed by research vessels there hasn't been a significant stock of fish found. However, if those stocks rebuild to former levels a fishery of 100 000 tonnes could be possible. High costs of fuel have also discouraged US fishermen from pursuing the Georges Bank fishery.

TABLE 4

US herring landings, 1977-80*

(000 tonnes, round weight)

	1977	1978	1979	1980	1981
Atlantic Coast	51	50	65	82	64
Pacific Coast (including Alaska)	20	20	30	40	--
Total	71	70	95	122	64

* Source: US Dept. of Commerce, NMFS Yearbook of Fisheries Statistics, Washington, DC and preliminary data.

Imports

Imports of herring products have been substantial, averaging 64 000 tonnes (product weight) valued at US $66 million per year from 1977 to 1979. The largest item by both volume and value has been canned sardines, followed by pickled and cured herring and canned herring. Other items are fresh herring and smoked or kippered products. (Tables 5 and 6).

In the fresh or frozen category the bulk of the imports come from Canada in the fresh state from weir fishermen in the Bay of Fundy area, to be used for sardine production. According to US statistics[1] the sardine component of fresh imports was as follows: 1977, 17 791 tonnes; 1978, 23 547 tonnes; 1979, 16 162 tonnes.

Imports of canned sardines come primarily from Norway, Canada and Japan. The European imports serve primarily ethnic markets and are predicted to continue at similar levels to 1985. Large volumes of canned sardines also come from Peru. Other canned imports come chiefly from Canada, Norway, FRG and Iceland and are projected to continue in similar quantities to 1985.

Pickled and vinegar cured imports, primarily from Canada, are utilized for further processing in the US. These imports come from each of the Atlantic provinces, but products from Newfoundland are reported to be in largest demand because of size and quality. Occasionally US processors obtain supplies from Iceland and European countries when quality products are not available from Canada. According to persons in the trade, Canada will continue to supply the lion's share of these products in the future because size and quality of herring from the US Atlantic fishery are not as suitable for pickled products. Size and fat content are the two criteria in the choice of supply. Herring of 12 to 14 inches or larger is preferred mainly because of the higher costs associated with processing smaller sizes.

---

1 Source: Resource Statistics Division, (F/SRI), National Marine Fisheries Service, Washington, DC 20235.

TABLE 5

US imports of herring products.

('000' tonnes, product weight)

	Fresh/frozen		Pickled/salted		Canned		Sardines	
	1979	1985	1979	1985	1979	1985	1979	1985
Canada	18	15	9	11	2	3	2	2
Iceland	--	--	--	--	0.2	0.2	0	0
FRG	--	--	--	--	0.2	0.2	0	0
Norway	--	--	--	--	0.2	0.2	8	8
Peru	--	--	--	--	0	0	6	6
Japan	--	--	--	--	--	--	2	2
Mexico	--	--	--	--	--	--	1	1
Other	0	--	0	--	0	0	4	4
Total	18	15	9	11	2.6	3.6	23	23

Source: US Dept. of Commerce, US Imports for Consumption Washington, DC.

TABLE 6
Canadian herring exports to the United States, 1978-81
(Q: tonnes, product weight; V: $'000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Fresh, whole or dressed	22 073	5 886	11 441	2 068	5 462	1 072	2 753	634
Frozen, whole or dressed	1 827	1 437	3 178	2 021	1 297	1 037	2 821	2 122
Frozen, fillets	2 857	4 447	1 612	1 710	507	573	429	581
Smoked	548	944	441	1 134	452	1 135	605	1 542
Vinegar-cured, fillets	4 405	5 365	3 323	4 362	2 556	4 129	3 906	5 734
Vinegar-cured, whole or dressed	430	422	322	416	526	744	425	569
Pickled, fillets	4 654	5 774	2 587	3 611	2 726	4 319	2 792	3 911
Pickled, split	708	753	463	533	314	430	500	681
Pickled, whole or dressed	1 400	1 453	905	1 057	1 655	1 794	1 084	1 410
Canned	2 378	5 728	2 326	6 412	1 887	6 958	1 726	7 047
Sardines	1 218	3 316	1 702	4 795	1 837	5 410	1 561	5 447
Sub total	42 498	35 525	28 300	28 119	19 219	27 601	18 602	29 678
Herring roe	41	427	61	1 530	46	503	46	805
Herring meal	10 473	4 979	6 874	3 538	6 710	3 942	7 156	4 376
Herring oil	3 579	1 733	6 274	1 716	3 622	1 676	4 196	1 895
Sub Total	14 093	7 139	13 209	6 784	10 378	6 121	11 398	7 076
GRAND TOTAL	56 591	42 664	41 509	34 903	29 597	33 722	30 000	36 754

Source: Statistics Canada, Exports by Commodity, Ottawa.

3. Federal Republic of Germany (FRG)

With total consumption of more than 200 000 tonnes round weight, the FRG remains the largest herring market in the Western world. Herring also remains the largest single species imported and processed. Before the implementation of exclusive fishing zones, the FRG fishing fleet was able to supply about 25% of the demand, as shown below:

	Q('000 tonnes)		
Area of Catch:	1970	1974	1977
North Sea; Channel; Sound and Belt Sea	50.7	15.1	0.2
The Baltic Sea	6.0	2.4	7.7
Scotland-Ireland	18.2	14.6	0.2
Northwest Atlantic	93.9	27.0	--
Total	168.8	59.1	8.1

Source: Jahresbericht

About 50% of the herring catches by the German fleet originated in the Northwest Atlantic before 1976. Since the beginning of 1977, catches have been limited to the Baltic and Skagerrak/Kattegat (6 200 tonnes in 1979) while the bulk of the 1979 demand of 221 500 tonnes was imported. Landings increased in 1980 and 1981 to 10 100 and 14 500 tonnes respectively as other areas were opened for fishing.

Tables 7 and 8 provide a summary of the country's supplies in 1977 and 1979. In this period, available supplies declined by 1.1% in terms of catch weight from 225 500 tonnes to 223 100 tonnes, indicating a remarkable stability in this processing sector. The larger decline (2.7%) in terms of product weight indicates a shift from round fish to fresh fillets and barreled herring. It is uncertain whether this trend continued into 1980 but increased imports from Denmark, Sweden and France indicate the preference for the use of fresh herring whenever available.

Tables 9 and 10 compare total imports by product form with those from Canada. Table 9 shows that in 1979 Canada was not able to maintain the market position achieved in 1977 in frozen fillets (68.4%) and in 1978 in cured

herring (63.9%). In 1979, Canada's market share of frozen fillets and flaps had declined to 62.6% and in cured herring to 57.8%, while Canada's share in the import of all herring products (in catch weight equivalent) declined from 32.5% to 30.8%. Total German herring imports declined slightly to 12 000 tonnes in 1981, and Canadian exports declined further to 24 620 tonnes. The export value declined by 33% between 1980 and 1981 (Table 9). However, Canadian frozen fillet exports have levelled off at 15-16 000 tonnes over the past three years (1979-1981).

In the fresh herring sector Denmark improved its position in 1979 as the predominant supplier with 72.7% of round and 94.9% of fillet and flaps imports. While Canada was still the major supplier (48%) of frozen round herring, Denmark increased its supply by 160% (1 500 tonnes) and the US by 55% to 2 920 tonnes (19.2% of total frozen round imports). Both countries increased their exports of frozen flaps and fillets. In sales of barreled herring, major increases were achieved by Denmark (1 072 tonnes), Iceland (2 321 tonnes) and Sweden (289 tonnes). Further deterioration in Canada's position took place in 1980, with data indicating a decline of 10.5%.

Taking account of improved supplies from Denmark, a German processor of marinades is now planning expansion of processing facilities in co-operation with a Danish company, to be located in Denmark.

Canned products account for about 40% of the total market for finished herring products in the FRG. Most products are of skin-on fillets in various sauces. Smoked fillets (bucklingsfilet) are also packed in sauce or oil. The traditional German favorite is fillets in tomato sauce, which is still very popular. Fried herring (brathering) is also marketed as a canned product. This was traditionally a cheap product, and sales have dropped off considerably with increases in raw material prices.

Product quality is quite variable and the fat content of the raw material is very important. Lean herring yields hard and dry fillets, while fillets that have a very high fat content become too soft and create production difficulties. Some processors emphasize quality more than others. The three largest firms, Norda, Hawesta and Appel, which are very quality conscious dominate the market, even though they are relatively high priced. Other lower-priced products are often marketed under private labels through supermarket chains, etc.

The other large product group consists of various marinated products, herring salads and herring in jelly. These products account for about 40% of the total market. They are not fully sterilized and must be stored under refrigeration. There are a large number of processors and labels also for this product group, with Norda being the largest. A few foreign products, for instance the Swedish Abba, can be found in supermarkets.

Salted (pickled) herring and smoked herring are now relatively small product groups, each accounting for about 10% of the West German market. A few years ago, salted herring was considered to be a cheap and lowly food product, but today the lightly salted, so-called Maatjes herring is considered a luxury and commands high prices (Table 8, item: fillets, salt).

One reason for the decline in the smoked herring market is the increasing popularity of smoked mackerel. Mackerel was once little used in the FRG, but has recently been promoted extensively for smoking and canning and now provides an estimated 10% of total raw material needs. In 1979, the FRG had 50 200 tonnes catch weight of mackerel available (domestic landings 20 300 tonnes, imports 29 900 tonnes). Of this, 20 000 tonnes were re-exported (the bulk in

round, frozen form) and year-end inventories had increased by approximately 6 500 tonnes, leaving a domestic disappearance of 23 700 tonnes. Since approximately 6 000 tonnes of mackerel are traditionally used for smoking, an estimated total of 236 400 tonnes of herring and mackerel were available for the herring processing industry, indicating that the decline in the long-term processor capacity is insignificant. Experiments with other herring substitutes such as pilchard seem to have been less satisfactory; imports of raw material declined from an estimated 6 000 tonnes in 1978 to less than 3 000 tonnes in 1979, and by the end of 1980 had come to a complete halt.

It is unfortunate that considerable quantities of poor quality Canadian frozen butterfly fillets were shipped to the FRG in 1980. The main reason is that herring from the Bay of Fundy in the summer of 1980 had unusually high fat contents; up to 23%-25% as compared with 14%-18% in normal years. Since the fish were also frequently full of "red feed", quantities of soft, ragged and high fat fillets were packed. These herring, if handled properly, would be well suited for light salting (Maatjes cure) for spice or sugar cure or hard cure. However, for vinegar cure, or frozen fillets for canning, 18%-20% fat and above is too high.

In the October 1979 edition of the herring marketing report, a number of complaints registered by German importers and processors were listed. They included such items as lack of uniform standards set and supervised by the Canadian government with regard to grading by size, grading by fat content (both are considered essential parts of a sales contract), quality of the fish, proper cutting and adequate packaging. Importers also complained about a general ignorance of trading customs. These require that the exporter cover the transport loss by overpacking by 4% over stipulated weight while the importer has to accept the loss of thawing (3%-5%). Also the difference in Canadian payment clauses from those of Scandinavian exporters was noted. Canadian exporters require cash payment against documents, forcing the importers to take all risks of financing, distribution and storage.

Although considerable progress had been made in meeting these and other complaints, 1980 represented a setback in the struggle to improve the image and reputation of Canadian herring. A very serious effort by fishermen, processors and government is needed to build confidence in the Canadian product. No exporter should enter the German market without a thorough knowledge of trading customs, quality requirements and specifications.

Due to the poor economic situation, prevailing low prices and adequate supplies of fresh fillets, it is difficult to be optimistic about the outlook for Canadian herring in the German market. Supplies of fresh fillets are expected to be liberal in 1982, and no substantial increase in prices are foreseen. Good quality frozen fillets of larger sizes are presently in demand at reasonable prices, but smaller sizes must compete with supplies of fresh fillets from Denmark, Ireland etc. High freight costs and EEC tariffs impose added costs on imports from Canada. However, there is a large market for frozen and cured herring in Germany, and Canada should be able to hold on to its share barring problems such as supply shortages (Bay of Fundy price problems), unfavourable exchange rates and quality. It is projected that about 25 000 tonnes of Canadian herring products could be marketed in Germany in 1985.

TABLE 7

FRG herring supply, 1977.

	Product Weight ('000' tonnes)	Catch Weight ('000' tonnes)	Value (million DM)	Average Product Price (DM/kg)
Imports				
Round, fresh[3]	13.9	13.9	20.0	1.44
Round, frozen[3]	17.0	17.0	23.8	1.41
Other, fresh [2][3]	27.4	55.6	55.2	2.01
Other, frozen[2][3]	38.3	77.7	72.8	1.90
Fillets, fresh	0.2	0.4	0.7	3.15
Fillets, frozen	0.4	0.7	1.1	3.06
Sub-total, fresh or frozen*	97.2	165.3	173.6	
Whole, salted	13.3	19.4	38.5	2.90
Headless & others, salted	2.4	3.8	6.6	2.79
Fillets, salted	1.6	5.6	8.1	5.02
Prepared in barrels[4]	9.1	23.3	24.3	2.67
Sub-total, salted or cured*	26.4	52.1	77.5	
Total Import	123.6	217.4	251.1	2.03
Domestic Production				
Round, fresh	6.3	6.3	5.3	0.85
Round, frozen	0	0	0	1.01
Other, frozen	0.2	0.4	0.5	2.65
Total domestic production	6.5	6.7	5.8	4.51
Imports from GDR				
Round, fresh	1.4	1.4	1.2	0.85
Total supply	131.5	225.5	258.1	1.96

*Discrepancies in Sub-totals are due to rounding

1) Conversion factors:

(flaps & fillets, fresh and frozen	2.03
Round, salted	1.46
Headless, salted	1.61
Fillets, salted	3.50
Flaps in vinegar	2.56

2) Primarily flaps
3) Feb. 15, 1977 - Feb. 14, 1978
4) Flaps in vinegar and spice-cured
Source: Annual 1977/78 p. 41.

TABLE 8
FRG herring supply, 1979.

	Product Weight	Catch Weight	Average DM/kg
	(000 tonnes)		
Domestic production	7.8	7.8	0.79
Imports			
Round, fresh	13.0	13.0	1.60
Round, frozen	15.2	15.2	1.46
Flaps, fresh	28.4	57.5	2.26
Flaps, frozen	35.6	72.3	2.02
Fillets, fresh	0.2	0.3	3.59
Fillets, frozen	0.7	1.3	2.53
Round, salt	12.7	18.6	3.11
Headless, salt	1.5	2.5	3.34
Fillets, salt	1.9	6.5	5.31
Vinegar and spiced H.	10.9	28.0	3.08
Total import	120.1	215.2	
Available supply	127.9	223.0	
Export			
Round, fresh and frozen	0.5	0.5	
Flaps and Fillets, fresh and frozen	1.3	2.6	
Vinegar flaps	--	--	
Salt herring	0.1	0.2	
Total export	1.9	3.3	
Domestic supply 1979	126.0	219.7	

Conversion factors:		
	Flaps and fillets, fresh and frozen	2.03
	Salt herring, round	1.46
	Salt herring, headed	1.61
	Salt fillets	3.50
	Vinegar flaps	--

Source: Geschaftsbericht des Bundes verbands der Deutschen Fischindustrie und des Fishgorsslandels e.v. May, 1980.

TABLE 9

Canadian herring exports to the FRG, 1978-81
(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	7 744	5 848	7 374	6 388	5 318	5 053	5 912	4 369
Frozen, fillets	20 667	26 079	15 870	20 059	16 782	22 673	15 392	13 953
Vinegar-cured, whole or dressed	0	0	598	856	469	633	467	709
Vinegar-cured, fillets	3 928	5 542	4 025	5 779	2 545	3 645	1 197	1 902
Pickled, whole or dressed	867	821	1 106	1 110	1 134	1 256	1 347	1 734
Pickled, split	43	30	75	68		14	15	16
Pickled fillets	1 339	1 613	768	972	597	824	290	340
Total	34 588	39 933	29 816	35 232	26 845	34 098	24 620	23 023

Source: Statistics Canada, Export by Commodities, Ottawa.

TABLE 10

FRG imports of herring and herring products
1977 - 1979
('000' tonnes)

Form		Total (product weight)	Total (catch weight)	From Canada (product weight)	From Canada (catch weight)
Fresh, round	1977	13.9	13.9	--	--
	1978	12.0	12.0	--	--
	1979	12.9	12.9	--	--
Fresh, fillets and flaps	1977	27.6	56.0	0.6	1.2
	1978	25.7	52.2	--	--
	1979	28.6	58.0	--	--
Frozen, round	1977	17.0	17.0	4.9	4.9
	1978	16.7	16.7	8.3	8.3
	1979	15.2	15.2	7.3	7.3
Frozen, fillets & flaps	1977	38.6	78.4	26.4	53.6
	1978	36.9	74.9	22.3	45.3
	1979	35.6	73.8	22.2	45.1
Total, Fresh and Frozen	1977	97.1	165.3	31.9	59.7
	1978	91.3	155.8	30.6	53.6
	1979	92.3	159.9	29.5	52.4
	1980	95.3	NA	NA	NA
	1981	91.9	NA	NA	NA
Dried, salted or smoked	1977	18.2	31.1	0.3	1.1
	1978	16.2	27.7	0.2	0.7
	1979	16.1	27.6	0.5	0.9
	1980	17.5	NA	NA	NA
	1981	16.7	NA	NA	NA
Cured, pickled	1977	9.1	23.3	5.1	13.1
	1978	9.7	24.8	6.2	15.9
	1979	10.9	27.9	6.3	16.1
Canned	1977	6.3	8.8	--	--
	1978	5.1	7.1	--	--
	1979	7.0	9.8	--	--
Total, Cured, pickled and canned (herring preparations)	1977	15.4	32.1	5.1	13.1
	1978	14.8	31.9	6.2	15.9
	1979	17.9	37.7	6.3	16.1
	1980	15.8	NA	NA	NA
	1981	12.0	NA	NA	NA
Grand Total	1977	130.7	228.5	37.3	73.9
	1978	122.3	215.4	37.0	70.2
	1979	126.3	225.2	36.3	69.4
	1980	128.7	NA	NA	NA
	1981	120.6	NA	NA	NA

Note: Data based on FRG statistics. Inconsistencies with Table 9, based on Canadian statistics, may be due to time lags or different customs classifications.

1) assumes 70% fillet content

Source: Spezialhandel nach Waren, various issues.
European Supplies Bulletin, May 1982

4. Japan

Herring landings in Japan were more than 150 000 tonnes annually in the early 1950s but declined steadily to a low in 1978 of 6 708 tonnes. Since 1981, there has been an increase of 12 000 tonnes. Earlier in this century, landings were much higher, reaching a peak before World War I when a level of 670 000 tonnes was recorded. The decline prior to 1976 was attributed to overfishing, changes in water currents and the closure of fishing in the Sea of Okhotsk by the USSR. Further declines occurred after 1976 as a result of extended fishing jurisdictions in the North Pacific. At present the Japanese herring fishery is concentrated in the Hokkaido area and the eastern China Sea. A small increase is expected in the catch level in future years.

Herring roe

With the drop in Japan's domestic catch, supplies of herring roe declined because of import quotas, which were in effect for roe and frozen herring. In the 1960s the tight supply situation caused prices to rise as high as 6 500 yen per kilogram at the Tokyo Central Wholesale Market, making roe a luxury product. The import quota was removed in 1972, and large volumes of imports began to come into the country. China was the main exporter until 1974, when supplies from that source all but disappeared. It is reported that earthquakes caused permanent damage to Chinese herring stocks.

Coinciding with the liberalization of import quotas for herring roe in Japan, the herring fishery in British Columbia expanded to capitalize on the lucrative market. From 1975 to 1979, BC was the largest supplier of roe to Japan, accounting for 73% of imports. BC roe herring production increased from 34 605 tonnes in 1972 to a peak of 78 860 tonnes in 1976. After 1976, landings were steadily cut back by fisheries management, to a catch of 26 000 tonnes in 1982, because of declining herring stocks. However the average landed price to BC fishermen increased gradually over the period from 1972 to 1977 from C$56 per short ton; to C$350 per ton; in 1978 the price more than doubled to C$732 and in 1979 it quadrupled from the previous year to attain an average of C$2 975 per short ton.

Japanese imports of herring roe reached a high of 12 867 tonnes in 1976 and have declined since then to 8 220 tonnes in 1979, 6 000 tonnes in 1980 and 7 600 tonnes in 1981. Supplies from the US, China and Korea were relatively stable in these years, while the decline in total imports was reflected by smaller landings of herring in BC. As the availability of herring roe declined in Japan, prices moved up gradually in 1976, 1977 and 1978, but nearly doubled from 1978 to 1979[1].

The rapid price change of herring roe in BC was caused not only by the shortage in Japan, but also the decline in the value of the Canadian dollar vis a vis the yen: from an average of 300 yen per dollar in 1976 to 251 yen per dollar in 1977 and 182 yen per dollar in 1978[2].

The 1979 price escalation for herring roe began on the fishing grounds off BC in March, with intense competition among larger Japanese buyers, who seemed determined to corner a larger share of the market by gaining control over supplies. It was heightened by the absence of an industry guideline price, which prior to the 1979 season had been established through an auction by one of the large BC processors. This practice terminated in 1979 when the company signed an exclusive sales arrangement with one Japanese firm[3].

---

1) As an example the overall average annual import price of herring roe as reported in Japanese official trade statistics was as follows - 1976 = 2473 yen/kg, 1977 = 2848 yen/kg, 1978 = 3661 yen/kg, 1979 = 6975 yen/kg.

2) In February 1981, this value has declined to 165 yen to the Canadian dollar but by July 1982 it had increased again to 200 yen.

3) For the 1981 roe season it is reported that this company signed agreements with two or more Japanese firms.

The overall average price paid to BC companies for herring roe in 1979 was C$16 per pound - nearly double the previous year's price. Nevertheless, many companies faced financial hardship at that price because of the high costs of fishing.

Meanwhile, Japanese wholesale prices for large-size roe increased from 8 500 yen per kilogram in April to a peak of 14 000 yen per kg in December 1979 at least in part to speculative bidding. The Japanese news media reacted with vigorous criticism of this speculation, and as a result consumers boycotted herring roe during the New Year's holiday season, causing prices to plunge and leaving the trading companies with nealy 4 000 tonnes of roe to be carried over on inventory into 1980.

To make matters worse, in December of 1979 the Japanese Ministry of Health announced research findings indicating that the hydrogen peroxide used in bleaching herring roe could be a contributing cause of cancer, and said steps would be taken in the coming year to prevent its use.

In 1980, faced with a large carryover of roe in Japan and a decline in consumer demand, Japanese buyers only offered C$6 per pound for number-one grade BC roe. This led to a strike by a large number of BC fishermen, causing landings in 1980 to decline to 17 540 tonnes. Prices for roe in Japan remained steady from March through August at about 6 000 yen per kilogram but increased later in the year, reaching 7 300 yen in October. The demand for roe was running at a normal pace in early December 1980 but on December 18 prices started to decline, going from a range of 6 800-9 400 yen per kilogram to 3 500-5 500 yen on December 15 (for large size at the Tokyo Central Wholesale Market). A decline in price is normal in the final days of the gift-buying season but the 1980 decline was unusually pronounced, reflecting consumer resistance. The actual consumption of roe in 1980 was approximately 9 000 tonnes - up about 3 000 tonnes from the previous year but substantially lower than in years prior to 1979 (Table 11). In 1981 roe consumption increased to the 12 000 tonne level due to (1) attractive prices to consumers (2) sales promotion by importers and processors and (3) concerted merchandizing efforts by the trade.

As of October 1, 1980, the Japanese Ministry of Health changed the regulation governing the use of hydrogen peroxide in herring roe to require that the finished product must indicate that it had been treated. Most processors have been able to bleach by developing methods to meet the zero residue specifications, but consumers may harbour lingering doubts that continue to have an impact on the market.

In projecting the quantity of herring roe that will be exported from BC to Japan in future years one must conclude that resource restrictions will be the deciding factor. The catch in 1981 was 29 500 tonnes. Resource managers in the Pacific region are currently faced with signs of a declining resource, coupled with growing opposition to the roe fishery from the general public in BC. A possible future small scale development is the packaging of whole frozen female herring roe in consumer packs, done carefuly with scales intact. This type of product may be more acceptable to the BC public because it involves a total use of the herring.

For a number of years there have been a small exports of Canadian Atlantic herring roe to Japan [1], from fish caught in the spring and autumn spawning seasons. Atlantic herring roe is not as much in demand in Japan as roe from Pacific herring since the membrane is very thin, allowing for easy breakage and difficulty in keeping its shape. Furthermore, it is not as "crunchy" as Pacific herring roe and is used mostly for mixing in products that contain loose herring eggs. There is a large potential for this type of product, but the price is much lower - perhaps one-half that of Pacific herring roe. One company is currently preparing a consumer pack using seasoned Atlantic herring roe, and this may find a market. For the near future it is unlikely that a large trade will develop from Atlantic Canada because it is more profitable there to use herring for fillets and other food products. Roe is recovered as a byproduct in filleting operations.

Coinciding with the decline in the BC herring roe harvest, the herring fishery for roe is expanding in US waters of the Bering Sea and off southeastern Alaska. By the end of 1980, imports of herring roe from the US to Japan stood at 2 248 tonnes, compared to 1 090 tonnes in 1979. At the same time, imports of roe-bearing herring in 1980 from the US was around 20 000 tonnes compared to only 3 749 tonnes for 1979. It is therefore possible that the US will become the main roe supplier to Japan. It is thought that there is considerable potential for expanding US landings, particularly in Alaska's Bristol Bay, where a potential catch of 50 000 tonnes has been projected[2]. However, in 1980 biologists restricted the Bristol Bay catch to 20 000 tonnes because of a shortage of herring and lack of strong yearclasses of younger fish.

---

1) In 1977 production of roe in Atlantic Canada was 48 tonnes valued at C$274 000. In 1978 this figure increased to 79 tonnes valued at C$609 000.

2) The roe herring harvest in Alaska has increased significantly from 12 241 tonnes in 1978 to 33 029 tonnes in 1980.

The Japanese market for roe will be governed by available supplies, principally from the US and Canada, assuming Chinese production does not recover. Consumption was estimated at from 12 000 to 13 000 tonnes annually from 1976 to 1978. With the price increase in 1979, consumption declined to 6 000 tonnes. In 1980, consumption recovered to 9 000 tonnes. The 1981 consumption is estimated at 12 000 tonnes. The total market is projected to remain at about 10 000 tonnes per year (Table 11). However, the past two years have shown that the demand for roe is sensitive to prices, and that the market is in a precarious state. Since the product is not an essential but largely a seasonal luxury and gift item, it could very easily fall further out of favour.

Food herring

Japan has traditionally had a sizable food herring market. Prior to the extension of fishing jurisdictions, the domestic catch of more than 66 000 tonnes (1976) was used mostly for migaki or dried herring. In 1977 when the catch was reduced sharply, Japanese imports climbed to 30 600 tonnes from 5 910 tonnes in 1976 (Table 11). A principal cause of the sudden jump in imports in 1977 was a threat by the USSR to close its herring grounds to the Japanese. While a partial closure did indeed occur, causing a drop in landings to 20 000 tonnes from 66 000 in 1976, an increase in prices curtailed domestic consumption so that a significant portion of herring imports remained unused. In the face of high inventory levels, 1978 imports fell to more traditional levels of 7 000 tonnes.

The USSR herring incident is a lesson for Canadian exporters eyeing the Japanese market. Consumer reaction to sharp price increases, as well as supplies from traditional sources, can change the supply situation dramatically from one year to the next, creating unstable market opportunities.

Consumption of herring declined from 80 000 tonnes in 1976 to 35 000 tonnes in 1977 (Table 11) and to 25 000 tonnes in 1978. Imports increased to 12 742 tonnes to make up for the low domestic landings in 1979 and wholesale prices of herring increased in 1979 and 1980, resulting in lower consumption.

In 1979, the price being offered by the Japanese for food herring reached a high of C$700 per short ton, enough to attract considerable quantities from BC's fishery (non-roe) in December. In 1980, about 5 000 tonnes were imported from Canada prior to the November and December food fishery in B.C. indicating that some quantities were being obtained from Atlantic Canada. The roe herring imported from Alaska made up the largest part of the supply in 1980 - about 20 000 tonnes.

The import of frozen herring to Japan has traditionally been governed by an import quota system. Only herring for processing could be imported and this quota was allocated to the Hokkaido Federation of Fishermen's Co-operatives (HFFC), which, in turn, doled it out to various importers and processors. In late 1980, the Japanese Government announced plans to change this system so that some frozen herring could be imported directly for consumption and would no longer be controlled by the HFFC[1]. The quota for the second half of 1980 was to be 22 500 tonnes, of which 20 000 tonnes was for the HFFC and 2 500 tonnes was for trading companies. In 1982, a further increase in the import quota was allowed to 54 000 tonnes for the fiscal year and more allocation was given to trading companies.

In 1981, Atlantic Canada supplied significant quantities of food herring to Japan for the first time - about 16 000 tonnes. This herring was used mainly for fresh (thawed) sales direct to consumers by supermarkets and fish shops. Some was also processed into light salted or overnight dried with a split belly. It is apparent that Canadian Atlantic herring is popular with Japanese consumers and therefore should have a permanent place in the market. Since Pacific food herring could have a more profitable use for roe or spawn on kelp, the future export of that product to Japan may be phased out.

---

1) The change was initiated by the US in exchange for fishery allocations for Japanese fishermen in the US zone. The quota for direct consumption is to be allocated to importers on record, which are under government administrative guidance to source a significant volume from US firms.

TABLE 11
Herring and herring roe supply in Japan, 1976-1985.
(000 tonnes)

	1976	1977	1978	1979	1980	1981	1985
1. Herring:							
Total Catch	66	20	7	6	8	12	15
Foreign zone landings	49	6	2	2	NA	NA	0
Total Imports	6	31	7	14	30	50	55
Canada	4	21	1	6	8	23	16
US	1	7	5	6	21	22	30
Total Supply	72	51	14	20	38	69	80
Year-end stock	14	30	19	7	7	20	10
Domestic disappearance	80	35	25	32	38	49	60
2. Herring roe:							
Imports							
Canada	7.810	9.162	7.960	5.599	2.673*	4.185	3.300
US	1.202	0.719	0.670	1.090	1.440*	1.768	3.200
China	1.445	0.397	0.700	0.858	0.855*	0.469	0.500
S Korea	1.360	0.377	0.636	0.569	0.656*	1.007	1.000
Total	11.817	10.655	9.966	8.116	5.624*	7.645	8.000
Domestic production	1.0	1.0	1.0	1.0	2.0	2.0	2.0
Total supply	13.0	12.0	11.0	9.0	8.0	13.0	11.0
Year-end stock	3.0*	3.0*	1.0	4.0	3.0	1.0	1.0
Domestic Disappearance	13.0	12.0	13.0	6.0	9.0	12.0	10.0
Average Price (yen/kg) (Tokyo Central Wholesale)							
Frozen herring:							
Nominal	243	423	378	538	720		
Real(in 1976 yen)	243	392	337	464	571		
Herring roe:							
Nominal	2 473	2 848	3 661	6 957	6 550		
Real(in 1976 yen)	2 473	2 544	3 269	5 997	5 198		

* Estimated.

Sources: 1. Japan Marine Products Importers Association.
2. Dept. of Fisheries and Oceans Worldwide Fisheries Marketing Study - Phase one - Japan, Ottawa, 1979.

It is projected that future food herring exports from Canada will be at least 16 000 tonnes by 1985.

Herring spawn on kelp

Spawn on kelp was first imported to Japan in 1962 from Alaska. The market in recent years has ranged from 357 tonnes to 544 tonnes (Table 12). There are two basic market segments - one for restaurant or high class consumption and the second for home consumption. The first market requires top quality products while the second market accepts more of the lower grades. Restaurant demand has been estimated at 200 tonnes while the home consumption trade is much larger. BC production has traditionally been used mainly in the luxury trade because the quality has been better than that of the product from Alaska, the reason being that it is produced under controlled conditions in ponds where the spawn is layered on the kelp.

TABLE 12

Japanese imports of herring spawn on kelp, 1977-1982.

	1977	1978	1979	1980[1]	1981	1982
Korea	0	27	0	0	0	0
US	312	185	292	304	212	NA
Canada	113	145	214	240	173	240
Total	425	357	506	544	385	NA

1) to October, 1980.

Source: Japan Marine Products Importers Association.

The luxury market expanded through the late 1970s at a rate of about 10 tonnes per year. A sudden increase in exports of this product to Japan would probably result in lower prices. The lower quality market is much more elastic and could be supplied with larger quantities without affecting prices significantly. The price of herring spawn on kelp is usually reflected in the herring roe price, although this was not the case during the speculative price boom in 1979.

The number of licences and production in BC has been held at existing levels since 1979 largely because of opposition to the issuance of any additional permits. This situation is likely to continue in future years unless fisheries managers decide to trade herring roe licences for spawn-on-kelp licences. This could result in less pressure on the herring resource as the herring could be set free after spawning on the kelp.

5. United Kingdom

In the past few years, the UK has had a severe shortfall of herring following the closure of the North Sea and Scottish herring fisheries. Landings were 145 000 to 155 000 tonnes in the years between 1970 and 1974. The rapid decline started in 1975 as shown in the following:

Year	1974	1975	1976	1977	1978	1979	1980
Herring landings(tonnes)	149 300	112 700	91 000	43 049	16 157	4 538	5 566

However, with the opening of the herring fishery around Scotland in 1981, landings increased to 36 300 tonnes and are expected to increase further in 1982 as the processing and distribution networks improve.

British consumption of herring declined correspondingly from an average of 0.6 kilogram per capita in 1974 to 0.1 in 1977.

TABLE 13

Utilization of British herring catches.

(tonnes)

	1975	1976	1977
Freezing, kippering	85 992	71 619	36 926
Canning	1 078	--	91
Smoking/salting	1 239	2 284	217
Lightly salted for export	13 491	11 660	4 995
Marinades	2 293	2 263	--
Pet food	4 590	1 323	98
Meal and oil	4 195	1 764	108
Total	112 878	90 913	42 435

Source: FERV - European Supplies Bulletin, Vol. 3, No. 5., May 1982

Statistics indicate that total landings of just over 4 500 tonnes in 1979 might represent total domestic consumption for that year, since exports equalled imports.

TABLE 14

United Kingdom herring imports and exports (tonnes)

	Imports			Exports		
	1978	1979	1980	1978	1979	1980
Fresh or chilled	2 877	2 506	6 247	3 895	1 210	3 673
Frozen	6 173	8 814	8 780	4 568	3 612	1 975
Kippers	98	129	--	1 070	467	--
Other smoked	25	47	14	776	1 253	1 456
Pickled, cured etc.	1 924	1 395	1 474	7 554	6 325	6 413
Total	11 097	12 891	16 515	17 863	12 867	13 517

Source: FERV Monthly Trade Bulletin

Mackerel appear to have been substituted for herring to a considerable extent on the British market. Mackerel landings have increased dramatically in recent years; from 48 360 tonnes in 1975 to 353 451 tonnes in 1979. Although most of this mackerel was sold over the side to East European vessels or exported to Nigeria, an intensive promotional program has succeeded in increasing the consumption of smoked, canned and fresh or frozen mackerel.

Canadian exports of herring products have been declining over the past four years as shown in Table 15.

TABLE 15

Canadian herring exports to the UK, 1978-81.
(Q: tonnes, product weight: V: C$'000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	3 191	2 385	1 964	1 878	897	1 007	879	1 179
Frozen, fillets	3 210	3 962	3 104	4 025	3 436	5 116	2 644	3 353
Vinegar-cured, fillets	112	90	71	93	15	19	--	--
Pickled, whole or dressed	1 144	905	947	710	523	468	272	229
Pickled, split	317	241	7	8	--	--	13	18
Pickled, fillets	--	--	12	16	568	544	--	--
Smoked	--	--	52	77	4	10	9	13
Canned	--	--	161	379	262	843	284	1 002
Sardines	--	--	41	143	47	138	31	109
Sub total	7 974	7 583	6 359	7 329	5 752	8 145	4 132	5 903
Herring meal	1 214	569	180	83	1 102	562	366	213
Grand total	9 188	8 152	6 539	7 412	6 854	8 707	4 498	6 116

Source: Statistics Canada, Exports by Commodity, Ottawa.

The export of frozen herring fillets has remained nearly constant until 1981, and the decline has primarily been in frozen whole and pickled products. Canada also exported more than 1 000 tonnes of herring meal to the UK in the years 1978 and 1980.

The long-term prospects for Canadian herring exports to the UK are uncertain. Indications are that imports will decline as herring landings from the Scottish and North Sea fisheries are better utilized and distributed. After the rather sudden opening of the Scottish fishery in 1981, large quantities went for fish meal due to the lack of processing and distribution facilities. This is now being corrected for 1982, although over-the-side sales to East Block vessels are going on in the summer of 1982.

It is projected (Table 1) that about 2 000 tonnes of Canadian herring products could be expected to be exported to the U.K. in 1985.

6. France

Canadian exports of herring products to France have been declining since 1978, and total French imports from all countries show a similar trend. Recorded French herring landings declined from about 14 000 tonnes in 1975 to about 3 300 tonnes in 1979. However, both in 1979 and in 1980 there were large landings of illegally caught herring, which were not reported in official statistics. Reported landings were 5 133 tonnes in 1980 and 14 037 tonnes in 1981 after a fishery was permitted in the Southern North Sea. Thus, although consumption appears to have declined sharply based on official landing and import figures, the drop may in fact be more moderate. Consumption in 1975-76 was about 23 000 tonnes product weight, and was estimated to be divided among the following products:

a) fresh	26%
b) fillets (sour) flat in 200 grams vacuum packed or rolled	22%
c) kippers	14%
d) "bouff", smoked, round	12%
e) salted or marinated	26%

French import statistics in Table 16 indicate that imports-exports totalled 13 600 tonnes in 1979. With recorded landings of 3 300 for 1979 added, total consumption was at the most 16 400 tonnes in 1979, considerably below the 23 000 tonnes estimated for 1975-76. However, if illegal landings were 6 000 to 7 000 tonnes, which is not an unreasonable assumption, total consumption would remain in the 22 000 to 24 000-tonne range. Imports declined slightly to 11 600 tonnes in 1981.

Table 17 shows that Canadian exports have declined sharply since 1978 and were only some 556 tonnes in 1981. The increased supply of lower priced fresh herring in France no doubt contributed to this decline, since high prices of frozen fillets in 1979 were generating consumer resistance.

TABLE 16
France, herring exports and imports, 1979.

Product	Origin	Imports Q (tonnes)	V (FF000)	Price (FF/kg)	Destination	Exports Q (tonnes)	Value (FF000)	Price (FF/kg)
Fresh or chilled	Denmark	1 671	8 562	5.12	Netherlands	793	2 536	3.20
	Sweden	310	1 726	5.57	Belgium/Lux	116	461	3.99
	Others	185	850	4.59	Others	156	641	4.11
	Total	2 266	11 138	5.14	Total	1 065	3 638	3.42
Frozen	Canada	4 166	19 913	4.78	Belgium/Lux	341	1 759	5.16
	Iceland	2 282	11 144	4.88	FRG	153	625	4.10
	Ireland	668	3 425	5.12	Netherlands	130	580	4.64
	Others	626	2 355	3.76	Others	45	256	5.69
	Total	7 742	36 837	4.76	Total	669	3 220	4.81
Pickled	Ireland	1 221	5 649	4.63	UK	22	109	4.95
	Canada	682	2 698	3.96	Ireland	15	72	4.80
	Netherlands	613	3 769	6.15	Others	4	64	--
	Others	470	2 330	4.96				
	Total	2 986	14 446	4.84	Total	41	245	6.05
Canned and other preparations	FRG	908	10 201	11.24	Greece	22	530	23.87
	Netherlands	656	6 509	9.93	FRG	4	29	7.25
	Denmark	435	5 597	12.87	Others	19	259	--
	Others	111	974	8.77				
	Total	2 110	23 281	11.03	Total	45	818	18.38
Grand Total		15 088	86 987			2 002	11 420	
			Balance					
			Imports - Exports			13 086	75 567	

Source: Rapport sur le Commerce Extérieur des Produit de la Pêche en 1979.

For 1980 and 1981, herring imports and exports were as follows:

	Imports				Exports			
	1980		1981		1980		1981	
	Q	V	Q	V	Q	V	Q	V
		(million fr.)						
Fresh and frozen	8 346	42.45	7 513	36.13	12 634	26.42	8 822	21.04
Dried, salted or smoked	2 720	14.16	2 161	10.41	N.A.		N.A.	
Herring preparation	2 040	23.50	1 901	23.88	N.A.		N.A.	
	13 106	80.11	11 575	70.42				

Source: FERV, European Supplies Bulletin, Vol. 3, No. 5., May 1982.

TABLE 17

Canadian herring exports to France, 1978-81.
(Q: tonnes, product weight: V:C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	1 595	1 252	799	910	297	408	21	25
Frozen, fillets	4 546	6 252	1 956	2 445	1 600	2 379	535	598
Smoked	--	--	--	--	17	8	--	--
Vinegar-cured, fillets	--	--	28	43	36	24	--	--
Pickled, whole or dressed	42	63	588	454	104	71	--	--
Pickled, split	97	100	133	99	30	27	--	--
Pickled, fillets	68	74	73	91	12	18	20	20
Total	6 348	7 741	3 577	4 042	2 096	2 935	556	643

Source: Statistics Canada, Exports by Commodity, Ottawa.

The outlook for Canadian exports to France is poor following the opening of a fishery in the southern North Sea and the inability of the EEC to control illegal fishing. In order to be able to compete, Canadian exporters must be prepared to supply good quality frozen fillets, within size limits and fat contents specified, at reasonable prices. The longer-term outlook depends on the management of the North Sea stocks since an accelerated fishery in 1982 and 1983 could affect the slow recovery there.

It is projected that Canadian exports to France by 1985 will at the most be about 1 000 tonnes product weight.

7. The Netherlands

Landings of herring by Dutch fishermen decreased from 57 090 tonnes in 1976 to 19 701 tonnes in 1977, 7 000 tonnes in 1978, about 3 000 tonnes in 1979 and to 2 700 tonnes in 1980. In 1981 langings increased sharply to 16 700 tonnes as a fishery was opened in the Channel/Southern North Sea area. Decreased landings and higher prices for imports caused per capita consumption to drop from 2.7 kilograms in 1976 to 1.7 in 1978, and total consumption to decline from 37 500 tonnes to 24 000 tonnes. Consumption of the traditional Maatjes cured herring, a lightly salted (mild cure) product prepared from fat herring, shows a substantial decline due to supply shortages and high prices. Canadian sales increased from about 5 000 tonnes of frozen herring, both fillets and whole or dressed, in 1977, to more than 10 000 tonnes whole or dressed and 1 200 tonnes cured in 1978 (according to Dutch statistics). Considerable quantities of herring from BC were included in these shipments. Canadian export statistics show considerably lower figures (Table 18), and also show that Canadian exports to the Netherlands decreased sharply from 1979 to 1981 when only 1 040 tonnes was recorded.

The Netherlands has traditionally been a large exporter of herring, and the quality of fish imports is of primary concern to traders, since their international reputation depends upon the quality of their products. The Dutch have established markets throughout the world and will attempt to retain and service these markets by relying on imported raw materials, as long as it is profitable for them to do so.

The perception of Canadian quality certainly appears to influence the price the Dutch are prepared to pay for Canadian fish, but to interpret their bargaining in fish negotiations with Canada as only price consciousness is misleading. Their perceptions of inferior Canadian quality continue to underlie sales negotiations, and until this can be overcome, Canadian exporters can expect to meet price resistance, particularly for species such as herring.

The Dutch are especially dissatisfied with the Canadian grading system for herring. They normally want the following grades for herring: under six per kilogram, six to nine per kilogram and nine to 12 per kilogram. It would appear that it is not unusual for an importer to request a grading of six to nine, and and receive a load of herring which has a large number of small and large fish which, when averaged, give between six and nine but have very few fish in that size range.

Dissatisfaction was expressed also with fat content quoted by Canadian exporters that often has very little resemblance to the level requested. Canadian west coast herring has experienced difficulties in the Netherlands. The problem could perhaps be viewed as one of interpretation. The Europeans are trying to use spawning herring to make smoked products, etc. The bellies of these herring are too soft to be transformed into their traditional products. This may be a case of the Canadian misrepresenting his product, or the European buyer misinterpreting what he is getting.

If Canadian exporters could resolve these problems, it could go a long way toward minimizing the effects on purchases from Canada when the North Sea is opened again for herring fishing. Part of the Netherlands herring market could be retained by clearing up these problems.

Another factor to be considered is that many European processors have sold much of their equipment and will take time for them to re-establish their herring operations.

As a result of the herring ban in the North Sea a number of herring trawlers are now fishing mackerel, and a number of processors have converted to processing mackerel. In order to encourage the switch, the EEC and the Netherlands government are subsidizing Dutch firms that export mackerel to non-EEC countries. The subsidy is at present five units of account per 100 kilograms and is reviewed every three months. A unit of account is equal to 3.4027 Dutch guilders, which equals approximately 17 guilders per 100 kilograms, or C$100 subsidy per tonne of mackerel exported. Because of this subsidy, it is possible for the Dutch to export mackerel to Canada at approximately C$460 per

tonne CIF Canadian port. This price is very close to what our own Canadian processors can obtain in Canada.

While some officials consider that mackerel is being used as a substitute for herring, there is a growing feeling that this is not the case, but that a new product has been introduced into the European market.

TABLE 18

Canadian herring exports to the Netherlands, 1978-1981.
(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	5 076	3 223	1 996	1 609	166	191	71	93
Frozen, fillets	1 940	2 582	853	1 108	713	1 127	804	1 114
Vinegar-cured, fillets	12	26	14	25	--	--	--	--
Pickled	668	429	901	600	96	95	130	90
Smoked	6	5	--	--	75	53	2	3
Sardines	24	57	23	58	54	166	29	88
Sub-total	7 726	6 322	3 787	3 400	1 104	1 632	1 036	1 388
Herring meal	--	--	--	--	874	40	--	--
Grand total	7 726	6 322	3 787	3 400	1 978	1 672	1 036	1 388

Source: Statistics Canada, Exports by Commodity, Ottawa.

The decline in imports of herring from Canada in 1979 and 1980 indicated in part that Canadian herring could not meet the high Dutch quality standards. The prospects for continued Canadian exports, therefore, hinge on the ability of Canadian processors to supply herring of top quality and with accurate specifications. The further decline in 1981 is also due to the resumption of herring fishing in the southern North Sea. This fishery is continuing in 1982, and Dutch processors are no doubt gearing up to take advantage of the improved supply situation. The outlook for Canadian exports to the Netherlands is therefore not bright, and a maximum of 1 000 tonnes is projected for 1985.

TABLE 19

Netherlands: herring imports and exports (tonnes)

Imports	1976	1977	1978	1979	1980(2	1981(2
Fresh/frozen	25 914	26 545	32 768	26 939	40 297	35 130
Salted	7 514	10 183	13 642	10 695	13 381	13 328
Smoked	--	60	49	--	--	--
Canned and semi-preserved	485	424	400	--	--	--
Total	33 913	37 212	46 859	37 634	53 678	48 458

Exports	1976	1977	1978	1979(1	1980(2	1981(2
Fresh	11 025	7 639	3 989	3 650	5 203	11 996
Salted	29 253	21 989	17 142	13 750	18 204	17 142
Smoked	--	2 019	1 689	--	--	--
Canned and semi-preserved	6 120	4 931	4 148	--	5 001	4 925
Total	46 398	36 578	26 968	17 400	28 408	34 063

1) 1/1 - 31/10

Source: Export Markets for Food Herring, by S. Sandsleth, FTFI, Tromso, Norway May 1980. FERV, European Supplies Bulletin, Vol. 3, No. 5., May 1982.

8. Sweden

Swedish herring landings increased from 108 500 tonnes in 1978 to 121 470 tonnes in 1979 with 18 200 and 16 000 tonnes respectively delivered directly to Danish ports. Sweden is a net exporter of herring, and sales of fresh, round herring increased from 37 000 tonnes in 1978 to 53 450 tonnes in 1979. Most of this (50 800 tonnes in 1979) was exported to Denmark where the herring were filleted and shipped to the FRG and other EEC countries. In 1980 and 1981, landings were 101 800 and 107 700 tonnes respectively, and exports of fresh or frozen round herring were 59 000 and 61 800 tones respectively. Exports of herring fillets and of herring preparations are also considerable and were 2 600 and 2 260 in 1980 and 2 100 and 1 890 tonnes in 1981.

Imports are chiefly limited to pickled and cured herring as follows:

TABLE 20

Swedish herring imports.

(tonnes)

Salt-cured herring	1978		1979		1980	1981
Norway	1 982	37.0%	1 758	29.7%	--	--
Denmark	21	0.4%	--	--	--	--
Iceland	989	18.5%	1 409	23.8%	--	--
Netherlands	8	0.2%	11	0.2%	--	--
Ireland	181	3.4%	155	2.6%	--	--
Canada	2 168	40.5%	2 579	43.7%	--	--
Total	5 349	100%	5 912	100%	6 508	4 398
Other pickled/cured herring						
	669	15.1%	60	0.9%	--	--
Denmark	504	11.5%	371	5.8%	--	--
Faroes	142	3.3%	--	--	--	--
Iceland	2 363	52.1%	4 812	74.0%	--	--
Ireland	300	6.9%	249	3.8%	--	--
Canada	485	11.1%	1 009	15.5%	--	--
Total	4 463	100%	6 501	100%	6 394	3 732
Grand Total	9 812		12 413		12 902	8 130

Source: Swedish Import Statistics.
FERV - European Supplies Bulletin, Vol. 3, No. 5, May 1982

It can be seen that the Canadian share of Swedish imports increased between 1978 and 1979. Canadian export statistics show that pickled herring exports to Sweden increased in 1980, but dropped sharply in 1981 (Table 21).

TABLE 21

Canadian herring exports to Sweden

(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	39	35	5	6	5	1	49	69
Frozen, fillets	36	66	65	106	9	15	151	236
Vinegar-cured, fillets & whole	216	246	828	960	162	214	27	46
Pickled, whole	2 341	1 991	1 483	1 789	2 908	3 125	1 512	1 684
Pickled, split	159	110	422	283	164	166	118	126
Pickled, fillets	392	501	790	1 172	1 333	2 057	978	1 404
Roe	11	92	6	85	74	1 109	18	209
	3 194	3 041	3 599	4 401	4 655	6 687	2 853	3 774

Source: Statistics Canada, Exports by Commodity, Ottawa.

Swedish buyers indicate that they would continue to buy from Canada even as additional supplies become available from Iceland and Norway. The major Swedish companies (Abba, Foodia, Witte) feel they played a major role in developing the Canadian Atlantic pickled herring industry over the past 10-20 years and have seen the quality improve gradually. In 1979, there was a shortage of large herring for pickling, especially in the Bay of Fundy where the large 1976 yearclass was just appearing, but in 1981-1982 these fish will have reached a suitable size. However, there are often quality and fat content problems in the Bay of Fundy, and Canada can have problems in packing enough considering the deteriorating supply situation in Newfoundland and the Gulf of St. Lawrence.

The Swedish industry also uses considerable quantitites of vinegar-cured herring, but depends chiefly on its own production and imports from Denmark for this product. The feeling is that the texture of Canadian vinegar-cured herring is quite different from the North Sea/Baltic product, but the industry would be willing to consider purchases if steady supplies and consistent quality can be guaranteed.

The total consumption of fresh fish is constantly decreasing in Sweden while consumption of frozen fillets, preserved and processed fish is increasing. Consumption of fresh and cured herring is decreasing slightly while sales of preserved herring products are holding steady.

The outlook for Canadian exports of pickled herring products to Sweden is only fair for the near future, and only for large fish (three to five kilograms or larger). Swedish buyers and inspectors are familiar with Canadian processors and various herring stocks and are working with them to improve quality and grading. However, Swedish processors are using more and moare of the smaller Swedish herring for their products and have met with good consumer acceptance.

There is increasing competition for large, cured herring from Norway and Iceland where stocks are increasing, and the outlook is therefore that Canadian exports will continue to decline to perhaps 2 500 tonnes in 1985.

9. Norway

Since Norwegian companies have been acting as European agents for Canadian exporters, Canadian statistics concerning exports to Norway could be misleading (Table 22) in that much of the herring was not actually used in Norway.

Since Norwegian herring stocks are slowly recovering, imports of herring products from Canada may virtually cease over the next two to three years; at the most a few hundred tonnes by 1985.

TABLE 22

Canadian herring exports to Norway

(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	59	62	91	136	18	10	40	56
Frozen, fillets	2 080*)	3 135*)	199	283	221	339	224	228
Vinegar-cured, fillets	178	176	--	--	41	61	39	23
Pickled, whole or split	31	31	225	161	428	383	571	497
Sub-total	2 348	3 404	515	580	708	793	874	804
Herring oil	100	52	--	--	1 102	1 166	--	--
Grand total	2 448	3 456	515	580	1 810	1 959	874	804

*) Represents fillets sold through Norwegian agents to other European countries, not for consumption in Norway.

Source: Statistics Canada, Exports by Commodity, Ottawa.

10. Belgium

Belgian recorded catches of herring were 1 407 tonnes in 1978 and 2 500 tonnes in 1979 and 1980. Landings of illegally-caught North Sea herring were reported in 1980, and actual landings are therefore probably higher. Landings increased sharply to 8 700 tonnes in 1981 as a fishery was opened in the southern North Sea.

Consumption of herring products appears to be fairly constant for 1978 and 1979, according to available import-export statistics. Exports for 1979 were small (400 to 500 tonnes) and increased to 1 940 tonnes in 1980 and 7 320 tonnes in 1981. Imports are shown in Table 23. Canadian export statistics for Belgium are shown in Table 24. Total imports declined from 9 762 tonnes in 1979 to 7 827 in 1980 and levelled off at 7 807 tonnes in 1981.

Although Belgian herring landings have increased in the past year, most of these appear to be exported since there is little processing capability in the country. Some imports of fillets will therefore be necessary even as North Sea catches improve, and Denmark and the Netherlands will be the main competitors of Canada. It is estimated that Canadian exports to Belgium in 1985 should be in the 700 tonne range.

TABLE 23
Belgian imports of herring products
(Q: tonnes; V: '000 Belgian Francs)

	1978		1979	
	Q	V	Q	V
Fresh or chilled				
Denmark	1 142	47 190	1 392	55 914
Netherlands	367	10 551	499	19 281
France	60	1 597	113	3 233
Others	63	2 576	66	2 495
Total	1 632	61 914	2 070	80 923
Frozen				
Canada	2 420	95 270	1 505	49 752
Netherlands	1 907	71 316	1 495	60 818
Iceland	60	2 005	525	17 457
Ireland	652	25 814	506	18 083
US	356	9 605	430	13 335
FRG	253	9 677	296	10 968
France	110	4 119	295	10 576
Denmark	111	4 125	275	10 151
Norway	334	12 778	202	7 799
Others	197	6 228	31	899
Total	6 400	240 937	5 560	199 838
Pickled or Smoked				
Netherlands	1 705	90 066	1 199	63 930
Ireland	131	6 225	14	657
Canada	--	--	12	331
	1 836	96 291	1 225	64 918
Canned or preserved				
FRG	425	40 608	443	42 949
Netherlands	481	33 278	382	28 716
Others	87	6 038	82	6 861
Total	993	79 924	907	78 526
Grand Total	10 861	479 066	9 762	424 205

Source: Belgian Import/Export Statistics

TABLE 24

Canadian herring exports to Belgium

(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	626	693	221	258	132	178	201	229
Frozen, fillets	1 286	1 699	1 275	1 460	1 847	2 753	612	695
Vinegar-cured, fillets	--	--	--	--	23	28	--	--
Pickled, whole fillets	22	23	26	21	--	--	53	74
Sardine	4	44	--	--	--	--	--	--
Total	1 938	2 459	1 522	1 739	2 002	2 959	866	998

Source: Statistics Canada, Exports by Commodity, Ottawa.

11. Finland

Finland has traditionally been a consumer of cured herring products and Finnish vessels used to participate in the summer fishery off Iceland. Since this fishery declined and eventually disappeared in the late 1960s due to overfishing of the Atlantic-Scandia stock, supplies of barreled herring have been imported from various countries.

Finland caught over 83 000 tonnes of Baltic herring in 1979, about 79 000 tonnes in 1980 and 88 500 tonnes in 1981. More than half is used for animal feed. Considerable quantities are marketed fresh. Herring caught this far up in the Baltic are usually quite small and lean and are not suitable for most pickled products, except possibly vinegar-cured. Finnish processors use mostly sugar-cured or spice-cured herring in their products, although vinegar cured fillets are also used to a considerable extent, including butterfly fillets as small as 12 to 17 per kilogram.

Finnish statistics show that imports of cured herring declined by almost 40% between 1976 and 1979. The chief reason appears to be buyer resistance to high prices, since it was indicated that Finland had just experienced a period of considerable economic difficulty. The drop in imports from Canada reflected the revival of the Icelandic cured herring industry, and also the lack of supply of suitable products from Canada. The import figures for 1980 and 1981 indicate a levelling off of herring imports, and indications are that Canadian exporters should in 1985 be able to market quantities similar to those recorded for 1980 and 1981.

TABLE 25
Finland imports of herring products
(Q: tonnes; V: '000 Finnish marks)

	1978			1979			1980	1981
	Q	V	FM/kg	Q	V	FM/kg	Q	Q
Pickled and cured								
Iceland	2 019	8 460	4.19	1 916	8 657	4.52	--	--
Norway	1 553	9 699	4.81	1 056	5 226	4.95	--	--
Ireland	130	664	5.11	272	1 566	5.76	--	--
Great Britain	544	3 312	6.09	377	2 404	6.38	--	--
Sweden	168	850	5.06	113	414	3.66	--	--
Canada	728	1 946	2.67	567	1 738	3.07	--	--
Others	20	100	--	--	--	--	--	--
Total	5 162	25 031	--	4 301	20 005	--	--	--
								--
Canned								--
Norway	61	650	10.66	9	179	19.90	--	--
Sweden	295	6 919	23.45	520	7 454	14.33	--	--
Iceland	--	--	--	3	42	14.00	--	--
Total	356	7 569	--	532	7 675	--	--	--
Grand Total	5 518	32 600	--	4 833	27 680	--	6 303	5 488

Source: Canadian Embassy, Helsinki
FERV, European Supplies Bulletin, Vol. 3, No. 5, May 1982.

TABLE 26
Canadian herring exports to Finland
(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	--	--	54	30	--	--	--	--
Vinegar-cured, fillets	10	17	--	--	--	--	--	--
Pickled, whole or dressed*)	372	501	36	21	599	623	711	911
Pickled, split	--	--	--	--	--	--	61	72
Pickled, fillets	--	--	--	--	--	--	118	122
Total	382	518	90	51	599	623	890	1 105

*) Additional quantities of Canadian herring appear to reach Finland through Sweden.

Source: Statistics Canada, Exports by Commodity, Ottawa.

Finnish importers have shown considerable interest in supplies of sugar-cured, spice-cured or vinegar-cured Canadian herring. The fat content of herring to be used for sugar-cured products should be in the range of 14% to 20%, and recommended quantities of salt and sugar are 17 and 5 kilograms per barrel respectively. This is less sugar than what is preferred by Swedish consumers.

The chief complaints about Canadian herring are low yield and excessive variation in quality. Since most Canadian east coast herring are fall spawners, the barreled, headless (nobbed) herring contains various amounts of roe and milt. This is lost in processing and filleting and represents a loss in yield compared to herring without roe or milt. Since roe and milt can be marketed in Japan and Great Britain, Canadian processors should ship more fillets instead of headless. Since Canadian cured herring may have been packed at different localities and times of the year and may belong to different stocks, quality and cure is not as uniform and consistent as the Icelandic product. However, some improvement in quality has been noted in Canadian cured herring over the past few years by Finnish importers.

12. Denmark

Denmark has purchased relatively small quantities of frozen fillets and other herring products from Canada since 1977, but by 1981, only 107 tonnes was recorded. The outlook for further sales is poor.

Denmark is a major herring processor and exporter, and the largest supplier of fillets to FRG and other EEC countries. In 1979, over 130 000 tonnes of herring was landed in Danish ports by Danish and foreign fishermen, filleted and exported. Advantages over Canada include closeness to fishing grounds and to major markets making it possible to deliver fresh fillets within hours. Also as an EEC member, Denmark pays no duties.

TABLE 27

Canadian herring exports to Denmark

(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, whole or dressed	654	290	--	--	35	50	--	--
Frozen, fillets	346	476	73	81	253	399	107	118
Vinegar-cured, fillets	77	77	--	--	--	--	--	--
Pickled, whole or dressed	23	47	50	54	--	--	--	--
Pickled, split	--	--	105	71	--	--	--	--
Sardines	--	--	31	83	73	187	--	--
Total	1 100	890	259	289	361	636	107	118

Source: Statistics Canada, Exports by Commodity, Ottawa.

13. Australia and New Zealand

Australia and New Zealand have become important markets for Canadian canned herring products over the last few years as shown in Tables 28 and 29. The outlook is good for continued and expanding sales to these countries and is projected.

TABLE 28

Canadian herring exports to Australia
(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Frozen, fillets	--	--	18	41	10	25	14	23
Smoked, boneless	--	--	3	8	7	19	--	--
Vinegar-cured, fillets	14	24	27	54	11	25	60	97
Pickled, whole or dressed, split, and fillets	8	15	85	159	88	197	10	20
Kipper snacks, canned	112	286	90	265	157	608	113	459
Canned	178	386	271	748	221	707	178	599
Sardines	328	887	472	1 376	550	1 861	464	1 729
Total	640	1 598	966	2 651	1 044	3 442	839	2 927

Source: Statistics Canada, Exports by Commodity, Ottawa.

TABLE 29

Canadian herring exports to New Zealand
(Q: tonnes, product weight; V: C$000)

	1978		1979		1980		1981	
	Q	V	Q	V	Q	V	Q	V
Kipper snacks, canned	14	35	16	46	1	3	28	92
Herring canned	15	24	28	62	61	163	80	222
Sardines	292	775	364	1 104	294	907	459	1 760
Total	321	834	408	1 212	356	1 073	567	2 074

Source: Statistics Canada, Exports by Commodity, Ottawa.

14. Caribbean Countries

Most of the Canadian production of smoked herring (bloaters) is exported to Caribbean countries, especially the Dominican Republic. It is expected that these countries will be able to take the largest part of Canadian production in future years. Canadian statistics indicate that exports have varied between 3 000 and 4 000 tonnes over the past three years.

These countries are also traditionally important customers for Canadian sardines, and canned herring especially the Dominican Republic, Trinidad-Tobago and Jamaica.

Exports to the region by 1985 are expected to be 3 000 tonnes smoked and 3 500 tonnes sardines and canned herring (see Table 1).

15. Other Countries

Relatively small quantities of various herring products are exported from Canada to a number of countries such as Israel, South Korea and various Eastern European countries. Some of these markets could become quite important by 1985. Since East European countries have government controlled import organizations, normal free market trade does not apply. Yet, these countries have large populations that were traditionally consuming herring products, and their fishing fleets are no longer able to supply the demand. Through various arrangements at the governmental level, considerable quantities of herring products could be exported to these countries in future years. Details of potential exports to 1985 are given in Table 1.

D. SUMMARY AND CONCLUSION

1. Low prices, for frozen herring fillets in particular, continue to prevail in 1982 as a result of increased European supplies and lower demand in part due to the current economic recession. Prices are not expected to improve in the near future and will continue to depend on supplies of fresh herring in Europe and the value of the Canadian dollar relative to key European currencies.

2. Canadian exporters were hit hard in 1980-1981 when poor quality frozen herring fillets filled warehouses for almost a year and contributed to a drop in prices. The lessson to be learned is that Canadian suppliers can no longer simply pay lip service to the maintenance of quality standards, and that a genuin effort must be made by fishermen, processors and government to ensure that products are of top quality and as described in specifications.

3. Projections in Table 1 indicate that by 1985 a total of about 190 000 tonnes of herring (live weight) can be marketed if an aggressive marketing strategy is maintained and quality improvements continue. This is close to the catch projected for that year (160 000 tonnes Atlantic; 30 000 tonnes Pacific). Over-the-side sales or other sales to East Block countries are not included and could take up the slack if there are short falls in established markets. However, low market prices will no doubt create economic problems for some fishermen and processors.

4. The United States and West Germany will remain the two main markets with Japan close behind. The importance of the Netherlands, France and the U.K. as Canadian markets has declined sharply as North Sea fisheries were resumed in 1981.

5. The stock situation is improving in Europe with quotas for EEC countries increasing to 199 000 tonnes in 1982 from 145 000 tonnes in 1981 in addition to landings by Norway, Sweden, Iceland and Baltic countries. Canadian landings are not projected to increase for several years.

6. Although the overall supply of herring is low as compared to the 1950's and 1960's, consumption is declining in major European markets. As a result, markets are easily disrupted by relatively minor increases in landings.

7. Canadian exports of herring products peaked at 172 000 tonnes in 1977 and declined in each succeeding year to around 96 000 tonnes in 1980. A slight increase to 117 600 tonnes was noted in 1981 mainly due to large sales of frozen round herring to Japan. The value reached $289 million in 1979 when roe prices were high, but declined to $159 million in 1980.

APPENDICES

APPENDIX I

THE WORLD HERRING RESOURCE

Total catches of Atlantic and Pacific herring between 1975 and 1980 are listed in Appendix Table 1. It can be seen that catches in the northwest Atlantic declined by over 155 000 tonnes and in the northeast Atlantic by 435 000 tonnes over this period. A high percentage of the landings listed under the Northeast Atlantic consists of Baltic herring. Landings of Pacific herring also declined sharply over the same period, especially in Japan and the USSR.

In the following sections various major stock complexes will be discussed and estimates for possible recovery times given.

1. Canada

Landings and landed values for Canada are shown in Appendix Figure 1. Peak catches on the Atlantic coast were reached in 1968 with most of the landings used for meal and oil production. The landings levelled off in 1972-73, but declined again over the past two years. The sharp increase in value coincides with the increasing shortages in Europe.

Landings on the east coast of Canada are expected to remain in the 150 000 to 200 000-tonnes range for the next few years. The Bay of Fundy stock complex is presently recovering well, due to the very large 1976 yearclass. Newfoundland stocks are declining, and the status of the Gulf of St. Lawrence stocks is uncertain. Unless good yearclasses appear in all these areas, catches will show a downward trend.

Pacific landings recovered from the low levels of the late 1960s but following declining catches in 1979, the predicted total allowable catches for the next few years have been revised downwards to between 30 000 and 60 000 tonnes.

2. The United States

Since foreign fishing for herring off the east coast of the US has now been phased out, it was expected that US landings would have increased sharply over the past few years. However, the stock situation on Georges Bank appears to be more serious than expected and the fishery has mainly exploited the Jeffreys Ledge - Gulf of Maine stock complex which is healthy. Two excellent yearclasses (1976 and 1977) led to increased landings in 1980. Due to lower market demand, landings decreased to 64 000 tonnes in 1981. The 1979 yearclass is also excellent, and landings should therefore be more affected by the market situation in 1982 than the availability of herring. Due to increased fishing effort in Alaska, the U.S. landings of Pacific herring has been increasing sharply, as shown in Table 1, Appendix II. Most of this herring is exported to Japan as round frozen or as roe.

3. Norway

a) The Atlanto-Scandia Stock or Norwegian Spring Spawning Herring

This stock represents one of the most dramatic examples of total collapse of a stock of fish as a result of intensive exploitation by modern fishing fleets. This stock was exploited at all stages of its life cycle by several countries, due to its migratory pattern and the peak catches of 1 955 000 tonnes were taken in 1966. (Appendix II Table 2 and Figures 2 and 3).

The chief spawning grounds for this stock are off the west coast of Norway, and fishing for the migrating spawners would start in January-February when the fish were known as storsild (large herring). At this point the fat content was usually 12% to 14%, and large quantities were shipped fresh, hard cured or frozen to European markets. The major part of the catch was used for the production of meal and oil. The spawning and post-spawning fish were known as varsild (spring herring); these were lean (6% to 8%) and chiefly used for meal and oil. The survivors then started on their long feeding migrations to the west and north.

The juvenile herring could be found in the Norwegian fjords and off northern Norway. They were heavily fished as one or two year olds ("mussa") which were packed as sild sardines, or as three year olds ("feitsild") which were of excellent quality for hard-cured or sugar-cured products. However, large quantities of these immatures were also used for reduction.

The mature herring were normally feeding heavily in the Iceland-Jan Mayen areas, and in late summer and fall the fishery for these so-called Icelandic herring ("islands sild") were carried out. The large fat herring (18% to 20%) were excellent for hard-cure or sugar-cured products. Expeditions of driftnetters, some with motherships loaded with barrels, set out from several countries to the fishing grounds off Iceland. Later, purse seiners also participated, and eventually an extensive meal and oil fishery was carried out. The herring started their spawning migration toward the Norwegian coast in late fall, and the Faroes fishery was carried out as the fish migrated past these islands.

When the fishery was carried out by gillnet vessels, shore seines or later by small purse-seiners operating with dories, the stock situation remained healthy. Gradually seiners became more mobile, and power blocks and modern fish-finding equipment enabled seiners to fish farther from shore and in poorer weather. The collapse of the stock was a result of over-fishing of both adults and juveniles in a period of several poor yearclasses. By 1972, practically no spawners appeared on the traditional spawning grounds.

With practically no fishery carried out between 1972 and 1977, the spawning stock increased to an estimated 200 000 tonnes in 1977 but declined again in 1979. The Norwegian government therefore banned all fishing for 1979 except limited amounts for fishermen's own use.

The outlook is for very slow recovery of this stock, and a token fishery of some 10 000 tonnes was permitted in 1980 increasing to 15 000 tonnes in 1982. It is unlikely that catches will be much higher than 20 000 to 30 000 tonnes by 1985 unless a strong yearclass appears this year or next.

b) Other stocks

Norwegian fishermen have also traditionally fished in the North Sea and off Scotland. No fishing was permitted in these areas in 1980, and the only other Norwegian landings anticipated would have to come from Kattegat-Skagerrak and so-called fjord herring, and would total only a few thousand tonnes. In 1982, Norwegian fishermen also have a quota of 12 000 tonnes off Scotland.

4. The North Sea

The North Sea herring stock complex, including herring taken in the Skagerrak-Kattegat area between Denmark and Sweden (Figure 3) supported herring fishing fleets and processing industries from 15 European countries up to the middle 1970s, as shown in Appendix II, Tables 3 and 4. From peak catches of close to a million tonnes in 1968, landings declined steadily year by year in spite of warnings by biologists whose recommended total allowable catches (TAC) were often greatly exceeded (Figure 4). An internationally agreed partial ban on fishing was imposed between March 1, 1977, and June 30, 1977, and between July 27, 1977, and January 31, 1978. The United Kingdom took unilateral action to ban herring fishing in her section of the North Sea from July 1, 1977. A total ban on directed fishing for herring has been in effect also for 1978 and 1979 except in Skagerrak and Kattegat (Table 4). Of the 41 200-tonne North Sea catch in 1977, about 10 000 tonnes were taken as bycatches in the industrial fisheries. The 19 000-tonne catch in 1979 was all classified as bycatch.

Biologists consider the Skagerrak and Kattegat stocks to be interdependent with the North Sea stocks, as shown in Figure 4. For example, the eastern and northern part of the Kattegat are considered to be feeding areas for juvenile herring from waters around Scotland as well as further north, and the eastern part of the Skagerrak for young herring from several other areas. Since the Skagerrak and Kattegat fisheries in the past two years have exploited chiefly one and two year olds (0 and 1 groups) biologists are seriously concerned about the effect of this fishery on the spawning stock and may have been the reason that the stock recovery have taken longer than predicted. Since the 1974 and 1975 yearclasses are considered to be very poor, resumption of fishing in the central North Sea has still not been allowed in 1982. The Skagerrak and Kattegat catch for 1979 was 65 600 tonnes and the North Sea "bycatch" 19 000 tonnes. In the fall and winter of 1980-81, there was a considerable illegal herring fishery in the Southern North Sea, especially by French and Belgian fishermen. The fishery was opened in the Southern North Sea in the fall of 1981 with a quota of 20 000 tonnes with 60 000 tonnes allocated for 1982.

5. Northwest Scotland and Northern Ireland

Historic catches by various countries from these stocks are listed in Appendix II, Table 5, and this shows that catches have declined sharply since the peak of 248 000 tonnes in 1973. The United Kingdom has taken the largest catches, and the fishing ban in effect until 1981 severely hurt the processing industry in that country.

The fishery was opened again in 1981 with a quota of 60 000 tonnes for Area VIa with 37 000 tonnes for the U.K. which was increased to 70 000 tonnes in 1982.

6. The Baltic

Catches of herring in the Baltic Sea (Figure 5) are considerable (Appendix II, Table 6), and the TAC recommended by ICES for 1981 is 341 000 tonnes. Actual landings will no doubt be considerably lighter. Baltic herring, although classified biologically as Clupea harengus, only grows to a maximum length of seven to nine inches and generally has a low fat content. It had therefore not been considered suitable as raw material for a number of popular consumer products in the major consuming countries in Western Europe such as the FRG and Sweden. However, with the recent shortages of larger herring, several products have been developed and are selling well in these countries. It is therefore likely that an increasing proportion of Baltic herring will be used for human consumption which could affect the traditional consumer preference for larger herring.

The herring stocks in the Baltic are considered to be fairly healthy and landings are expected to remain high or only show a slight downward trend over the next five years.

7. Iceland

In addition to the Atlantic-Scandia stock (Appendix Table 2), Icelandic fishermen also exploited local stocks along the south coast. However, these stocks were also decimated in the late 1960s, and the fishery was closed until 1975 when some 13 000 tonnes were taken. These stocks have been rebuilding and

35 000 tonnes were taken in 1978. It is expected that the slow recovery will continue with catches approaching 100 000 tonnes by 1985. Catches in 1980 reached 55 000 tonnes and will probably be at least that high in 1981.

The Icelandic south coast herring is very similar in quality to Canadian herring and has a fat content in the range of 12% to 16%. Most of the landings in 1978 were barreled, and total production was 194 400 barrels of cured herring. About 60 000 barrels were exported to the Soviet Union, 31 000 to Sweden and 35 000 to Poland.

With the increased catches in 1980, more frozen Icelandic herring appeared on the market, and some Icelandic vessels also landed fresh herring in Denmark.

APPENDIX II

TABLE 1

WORLDWIDE LANDINGS OF ATLANTIC AND PACIFIC HERRING

Species	Country	AREA	1975	1976	1977	1978	1979	1980
				(Tonnes)				
ATLANTIC HERRING				CLUPEA HARENGUS				
	Bulgaria	21	422	114	--	--	--	--
	Canada	21	245 295	225 659	229 189	242 568	187 910	177 163
	Cuba	21	1 309	327	171	1	0	7
	France	21	4 853	1 196	--	--	--	--
	GDR	21	30 901	7 891	--	--	--	--
	FRG	21	24 349	9 549	--	--	--	--
	Greenland	21	10	6	3	7	5	7
	Japan	21	2 079	868	1	2	0	--
	Poland	21	38 463	10 539	119	--	--	1
	Romania	21	1 544	124	9	1	--	--
	Spain	21	10	3	--	--	--	--
	USSR	21	62 933	16 113	1 836	2	--	12
	USA	21	36 170	50 133	50 627	50 490	65 033	83 459
	Total	21	448 338	322 522	281 955	293 071	252 949	260 649
	Belgium	27	2 451	1 445	57	1	2	1 030
	Bulgaria	27	814	224	--	--	--	--
	Denmark	27	216 662	107 252	93 589	66 658	63 921	65 970
	Faeroe Is	27	37 813	22 040	20 588	1 406	1 174	847
	Finland	27	70 557	76 861	78 051	89 468	83 130	88 542
	France	27	25 645	20 466	4 164	4 201	3 596	6 126
	GDR	27	76 409	62 016	62 452	46 261	50 241	59 187
	FRG	27	27 584	13 249	8 135	8 205	7 824	10 135
	Iceland	27	33 433	29 976	28 925	37 333	45 072	53 268
	Ireland	27	29 752	22 227	23 436	27 717	27 454	36 917
	Japan	27	--	--	--	--	--	--
	Netherlands	27	70 980	57 090	19 701	7 694	3 223	2 799
	Norway	27	40 188	36 540	20 361	19 793	10 274	17 135
	Poland	27	79 048	74 414	60 220	63 850	79 168	68 614
	Romania	27	147	303	--	--	--	--
	Sweden	27	100 599	92 756	105 264	112 919	125 786	129 382
	USSR	27	142 525	139 580	131 726	132 639	119 333	118 854
	UK Engld Wal	27	8 541	12 162	1 792	854	853	879
	UK Scotland	27	98 506	73 079	38 275	13 881	2 012	2 237
	UK No Ireld	27	5 618	5 770	2 982	1 274	1 722	2 450
	UK Isle Man	27	11 113	7 663	8 729	8 729F	7 730	5 862
	Total	27	1 078 385	855 113	708 447	642 883F	632 515	670 234
	Grenada	31	0	0	0	0	6	5
	Area Total	31	0	0	0	0	6	5
	Total	S	1 526 723	1 177 635	990 402	935 954F	885 470	930 888

APPENDIX II
TABLE 1 (continued)

Species	Country	AREA	1975	1976	1977	1978	1979	1980
					(Tonnes)			
PACIFIC HERRING					CLUPEA PALLASI			
	China	61	N.A.	55 321	17 539	21 806	38 938	39 900
	Japan	61	63 349	59 880	17 294	6 443	6 443	11 140
	Korea Rep	61	2 401	99	4 378	722	189	441
	USSR	61	313 700	192 163	253 227	57 828	72 900	79 251
	Total	61	379 450	307 463	294 438	86 799	118 470	130 732
	Canada	67	59 639	81 105	97 172	81 400	43 465	25 155
	GDR	67	1 538	465	--	--	--	--
	Japan	67	1 189	5 335	2 415	263	376	7
	Korea REP	67	--	--	--	1	--	40
	Poland	67	1 138	--	--	--	--	--
	USSR	67	14 201	16 812	46	4	16	--
	US	67	22 114	17 229	16 273	15 305	25 482	40 701
	Total	67	99 819	120 946	115 906	96 973	69 339	65 903
	Poland	77	250	--	--	--	--	--
	USA	77	1 087	1 092	3 792	4 239	4 301	7 868
	Area Total	77	1 337	1 092	3 792	4 239	4 301	7 868
	Total	S	480 606	374 180	394 597	166 205	192 110	204 503
Grand Total, Pacific & Atlantic Herring			2 007 329	1 551 815	1 384 999	1 102 159	1 077 580	1 135 391

Source: FAO, Yearbook of Fishery Statistics, Rome, Italy, Vol 46, 1978 and Vol 48, 1980.

AREAS:
21 Northwest Atlantic
27 Northeast Atlantic, includes Baltic Sea
31 Western Central Atlantic
61 Northwest Pacific
67 Northeast Pacific
77 East Central Pacific

APPENDIX II
TABLE 2
NORWEGIAN SPRING SPAWNING HERRING (ATLANTIC-SCANDIA STOCK)

Total catches in 000 tonnes

	Adults					Juveniles	
YEAR	Norway	Iceland	USSR	Faroes	FRG	USSR & Norway	TOTAL
1950	781.4	30.7	14.0	--	--	106.9	933.0
1951	902.3	48.9	43.0	--	--	284.2	1 278.4
1952	840.1	9.2	69.9	--	--	335.6	1 254.8
1953	692.2	31.5	110.0	16.2	--	240.7	1 090.6
1954	1 103.6	15.2	160.0	27.6	--	338.1	1 644.5
1955	979.3	18.1	207.0	13.1	--	142.3	1 359.8
1956	1 160.7	41.2	235.0	23.7	--	198.8	1 659.4
1957	813.1	18.2	300.0	17.0	--	171.2	1 319.5
1958	356.7	22.6	388.0	17.7	--	201.6	986.6
1959	426.9	34.5	408.0	13.7	--	228.0	1 111.1
1960	318.4	26.7	465.0	11.0	--	280.7	1 101.8
1961	111.0	85.0	285.0	16.9	--	332.2	830.1
1962	156.2	176.2	209.0	9.8	--	297.4	848.6
1963	130.4	177.5	350.0	12.9	--	313.7	984.5
1964	366.4	367.4	365.8	18.3	--	163.9	1 281.8
1965	259.5	540.0	489.2	31.5	5.6	221.9	1 547.7
1966	497.7	691.4	447.4	60.7	26.1	231.5	1 954.8
1967	423.7	359.3	303.9	34.9	9.7	545.7	1 677.2
1968	55.7	75.2	124.3	16.1	1.8	439.1	712.2
1969	15.6	0.6	3.2	4.4	0.3	43.7	67.8
1970	20.3	---	--	0.6	--	41.4	62.3
1971	6.9	---	--	--	--	14.2	21.1
1972	---	---	--	--	--	13.2	13.2
1973	---	---	--	--	--	6.8	6.8
1974	---	---	--	--	--	6.3	6.3
1975	---	---	--	--	--	3.1	3.1
1976	---	---	--	--	--	-	--
1977	---	---	--	--	--	13.3	13.3
1978	---	---	--	--	--	--	--
1979							

Source: Institute of Marine Research, Bergen, Norway.

APPENDIX II

TABLE 3

CATCHES OF HERRING IN THE NORTH SEA AND ENGLISH CHANNEL

(tonnes)

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	19791)
Belgium	1 200	681	1 337	2 160	603	2 451	1 430	57	--	--
Denmark	133 331	185 393	213 738	174 254	61 728	115 616	34 841	12 769	4 359	10 546
Faeroe Islands	58 365	45 524	48 444	54 935	26 161	25 834	14 378	8 070	40	--
Finland	--	--	--	--	--	--	1 034	--	--	--
France	11 482	11 408	12 901	22 235	12 548	20 391	14 468	1 613	2 119	2 350
East Germany(GDR)	290	475	127	1 728	3 268	2 289	2 624	2	--	--
West Germany(FRG)	7 150	3 570	3 065	10 634	12 470	6 953	1 654	221	24	10
Iceland	22 951	37 171	31 998	23 742	29 017	16 286	9 412	--	--	--
Netherlands	46 218	32 479	24 829	34 070	35 106	38 416	20 146	4 134	18	--
Norway	193 102	125 842	117 501	99 739	40 975	34 183	27 386	4 065	1 189	3 617
Poland	5 057	2 031	2 235	5 738	9 850	7 069	7 072	2	--	--
Sweden	34 670	36 880	7 366	4 222	3 561	6 858	4 777	3 616	--	--
England	9 702	4 113	394	2 268	5 699	6 475	9 662	3 224	2 843	2 253
Scotland	21 885	25 073	17 227	16 012	15 034	8 904	15 015	8 152	437	--
USSR	18 078	9 500	16 386	30 735	18 096	20 653	10 935	78	4	162
Total	563 481	520 140	497 548	482 472	274 116	312 378	174 834	46 003	11 033	18 938

1) Preliminary

Source: Fiskaren/Norw. Institute of Marine Research.

APPENDIX II

TABLE 4

CATCHES OF HERRING IN THE SKAGERRAK AND KATTEGAT

(tonnes)

Country	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979[1]
Denmark	30 107	26 985	34 900	42 098	35 732	29 997	7 363	19 382	6 425	5 153
Faeroe Island	--	5 636	4 115	5 265	7 132	8 053	1 533	10 064	1 041	817
FRG	--	--	--	--	36	108	6	32	28	181
Iceland	6 453	3 066	7 317	15 938	231	1 209	123	--	--	--
Norway	7 581	6 120	1 045	836	698	196	--	--	1 860	2 460
Sweden	26 930	19 763	19 644	20 429	11 683	12 348	6 505	8 109	11 551	8 104
Total	71 071	61 570	67 021	84 566	55 512	51 911	15 530	37 587	20 905	16 715
Norwegian Fjord Herring	1 830	3 166	4 222	1 680	1 720	1 459	2 304	1 837	2 271	2 259
Total Skagerrak	72 901	64 736	71 243	86 246	57 232	53 370	17 834	39 424	23 176	18 974
Kattegat	79 887	99 937	92 727	118 543	94 319	72 743	71 012	75 365	64 434	46 609
Total Skagerrak + Kattegat (IIIa)	152 788	164 673	163 970	204 789	151 551	126 113	88 846	114 789	87 610	65 583

1) Preliminary values

Source: Fiskaren/Norw. Institute of Marine Research

APPENDIX II

TABLE 5

CATCHES OF HERRING OFF THE COAST OF NORTH WEST SCOTLAND AND NORTHERN IRELAND, 1970-79 (AREA VIa)

'000 tonnes (live weight)

Country	1970	1971	1972	1973	1974	1975	1976	1977*	1978	1979
UK	103.5	99.5	107.6	120.8	107.5	85.5	53.4	25.5	14.0	2.1
Norway	20.2	76.7	17.4	36.3	26.2	0.5	5.3	1.1	4.2	--
FRG	16.6	7.7	4.1	17.4	14.4	9.1	5.0	0.1	0.1	--
Faeroe Islands	15.1	8.1	8.1	10.0	5.4	3.9	4.0	3.6	--	--
Ireland	11.7	12.2	17.3	14.7	12.6	10.4	8.6	7.2	8.1	4.6
Iceland	5.6	5.4	2.1	2.5	6.9	2.6	3.3	--	--	--
Poland	3.7	--	--	5.6	6.4	2.9	3.1	--	--	--
Netherlands	1.1	9.3	23.4	32.7	19.6	19.4	20.8	8.3	5.9	0.9
USSR	--	--	--	2.1	5.4	3.2	3.1	--	--	--
Others	1.5	2.9	1.8	5.9	2.6	3.7	4.9	1.8	1.6	--
TOTAL	179.0	221.8	181.8	248.0	207.0	141.2	111.5	47.6	33.9	7.6

* Provisional

Source: ICES Statistical Bulletins, Various Volumes.

APPENDIX II

TABLE 6

NOMINAL CATCH (TONNES) OF HERRING IN DIVISIONS IIIb,c,d, THE BALTIC SEA 1963-79

(Data for 1963-78 as officially reported to ICES)

Year	Denmark	Finland	GDR	FRG	Poland	Sweden	USSR	Total
1963	14 991	48 632	10 900	16 588	28 370	27 691	78 580[a]	225 752
1964	29 329	34 904	7 600	16 355	19 160	31 297	84 956	223 601
1965	20 058	44 916	11 300	14 971	20 724	31 082[b]	83 265	226 316
1966	22 950	41 141	18 600	18 252	27 743	30 511	92 112	251 309
1967	23 550	42 931	42 900	23 546	32 143	36 900	108 154	310 124
1968	21 516	58 700	39 300	16 367	41 186	53 256	124 627	354 952
1969	18 508	56 252	19 100	15 116	37 085	30 167	118 974	295 202
1970	16 682	51 205	38 000	18 392	46 018	31 757	110 040	312 094
1971	23 087	57 188	41 800	16 509	43 022	32 351	120 728	334 685
1972	16 081	53 758	58 100	10 793	45 343	41 721	118 860	344 656
1973	24 834	67 071	65 605	8 779	51 213	59 546	127 124	404 172
1974	19 509	73 066	70 855	9 446	55 957	60 352	117 896	407 081
1975	18 295	69 581	71 726	10 147	68 533	62 791	113 684	414 757
1976	23 087	75 581	58 077	6 573	63 850	41 841	124 479	393 488
1977	25 467	78 051	62 450	7 660	60 212	52 871	126 000	412 711
1978	26 620	89 468	46 261	7 808	63 850	54 629	130 642	419 278
1979	33 911*)	81 000**)	57 203**)	6 672**)	80 646**)	85 703**)	118 655	463 790

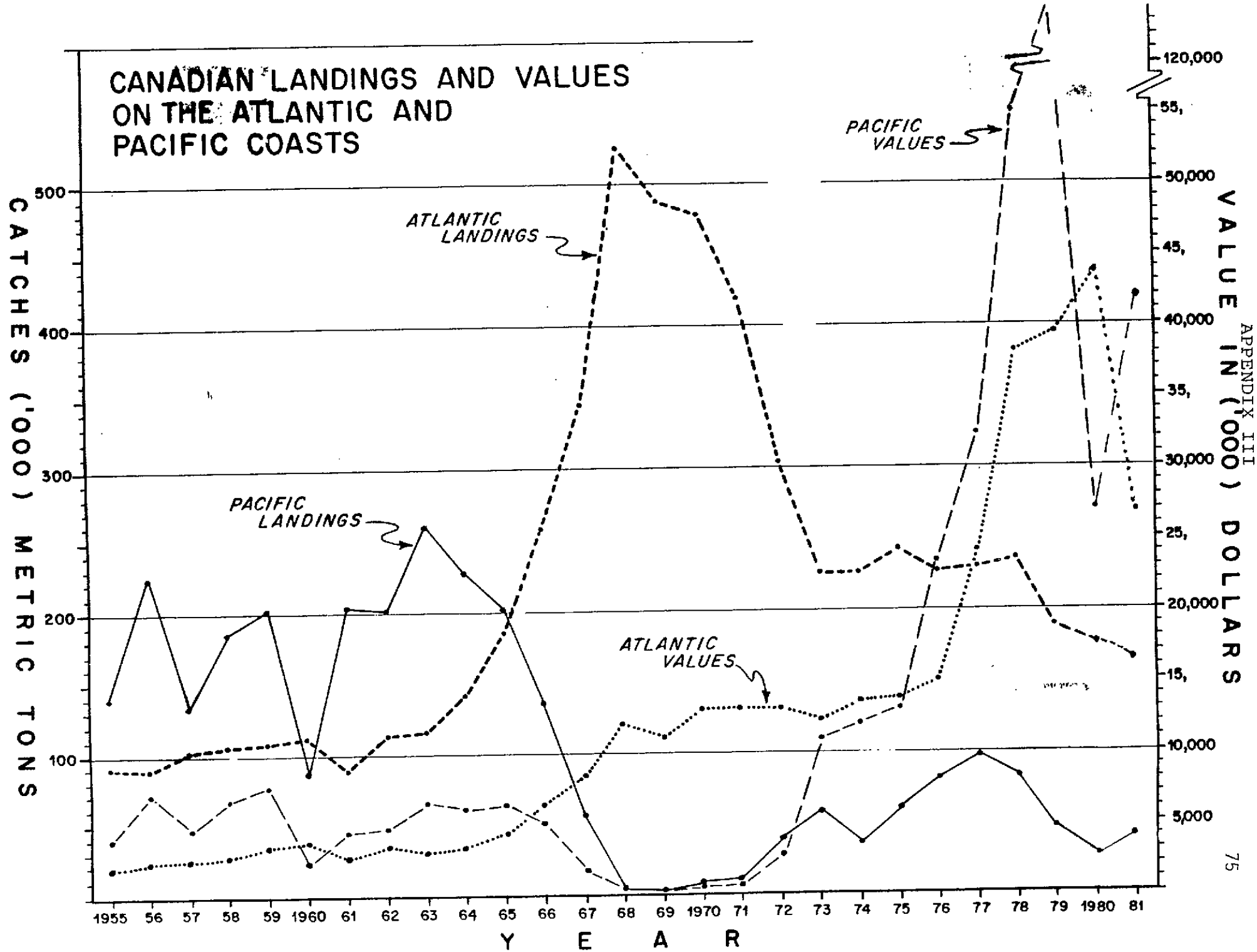
*) Preliminary.

**) Working Group data, by-catch of sprat excluded and by-catch of herring in sprat fisheries included.

a) Including Division IIIa.

b) Large quantity of herring used for industrial purposes is included with "Unsorted and Unidentified Fishes".

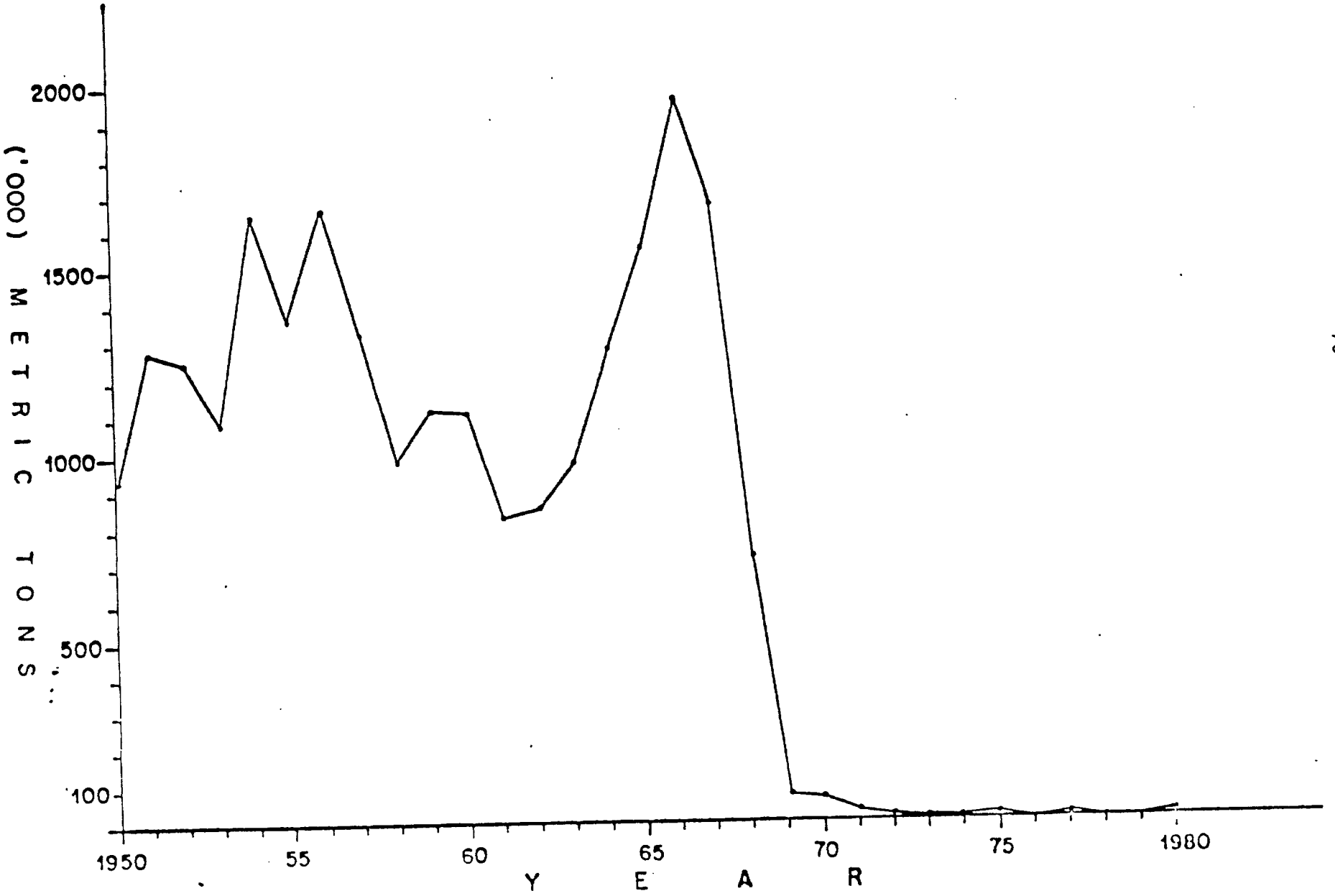
Source: ICES


CANADIAN LANDINGS AND VALUES
ON THE ATLANTIC AND
PACIFIC COASTS
ATLANTIC LANDINGS
PACIFIC LANDINGS
PACIFIC VALUES
ATLANTIC VALUES
CATCHES ('000) METRIC TONS
VALUE IN ('000) DOLLARS
500
400
300
200
100
120,000
55,
50,000
45,
40,000
35,
30,000
25,
20,000
15,
10,000
5,000
1955 56 57 58 59 1960 61 62 63 64 65 66 67 68 69 1970 71 72 73 74 75 76 77 78 79 1980 81
Y E A R

APPENDIX III

Figure 2

ATLANTIC-SCANDIA STOCK LANDINGS BY ALL COUNTRIES

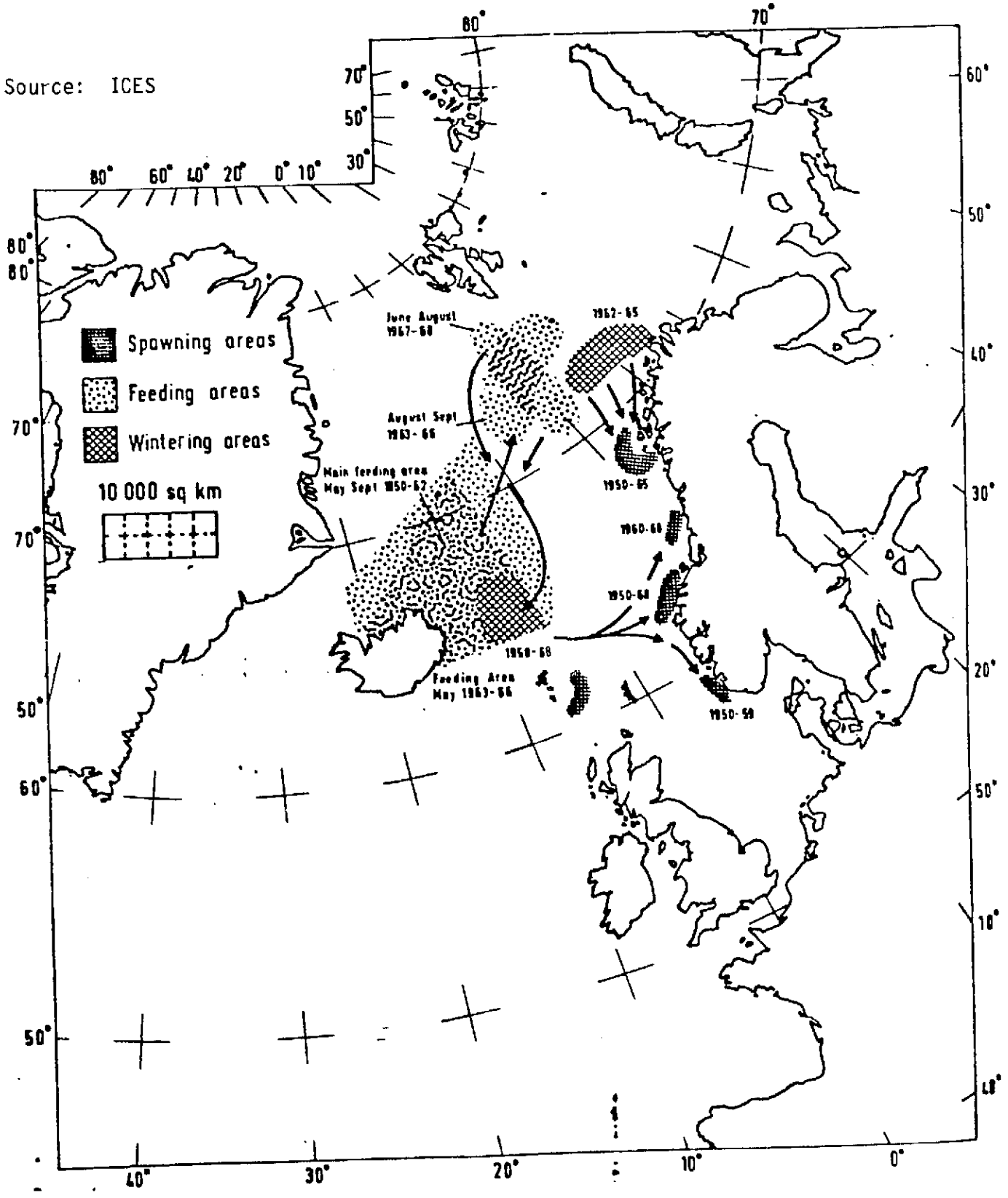


APPENDIX III

Figure 3

ATLANTO-SCANDIA HERRING

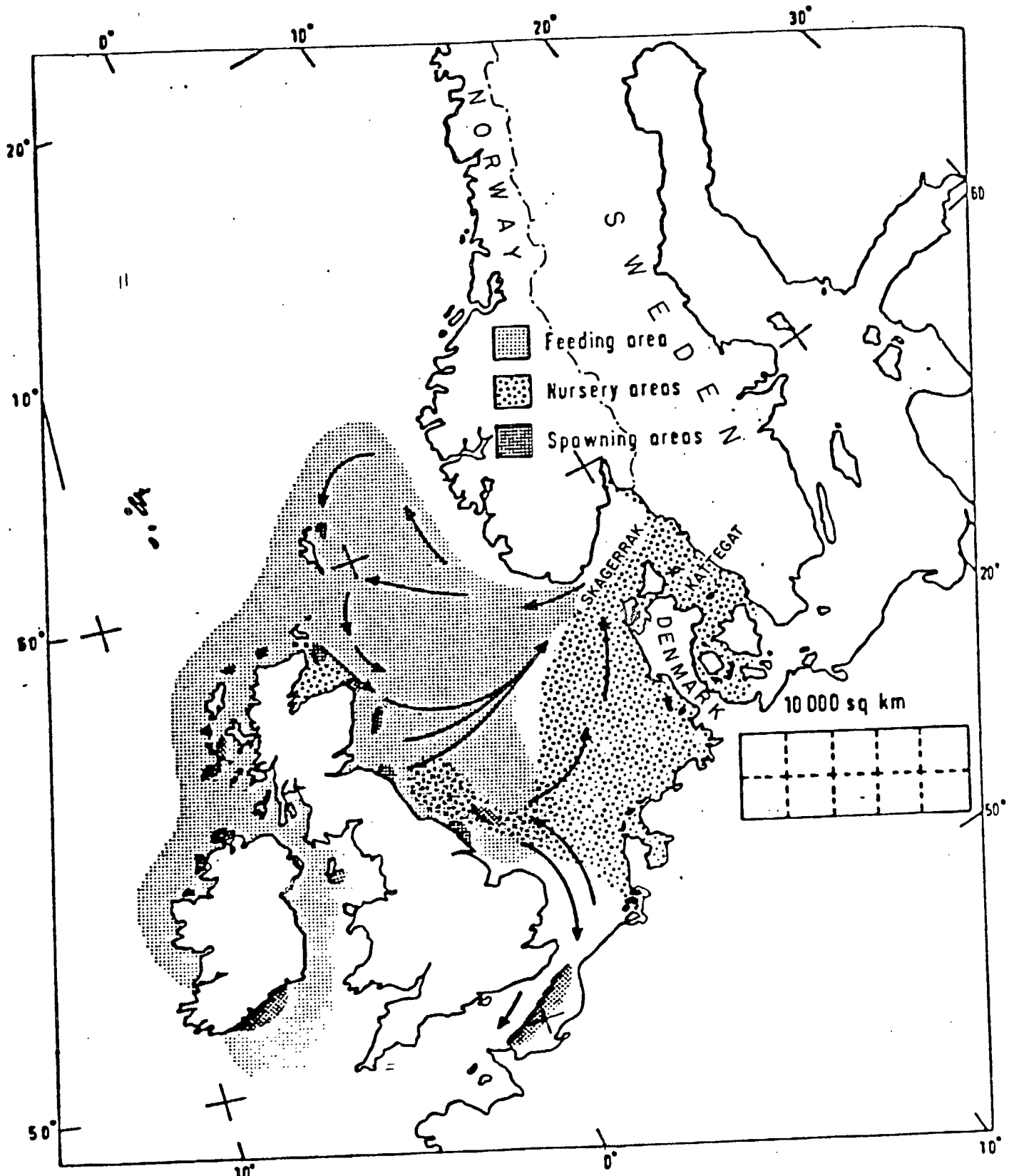
Source: ICES



APPENDIX III

Figure 4

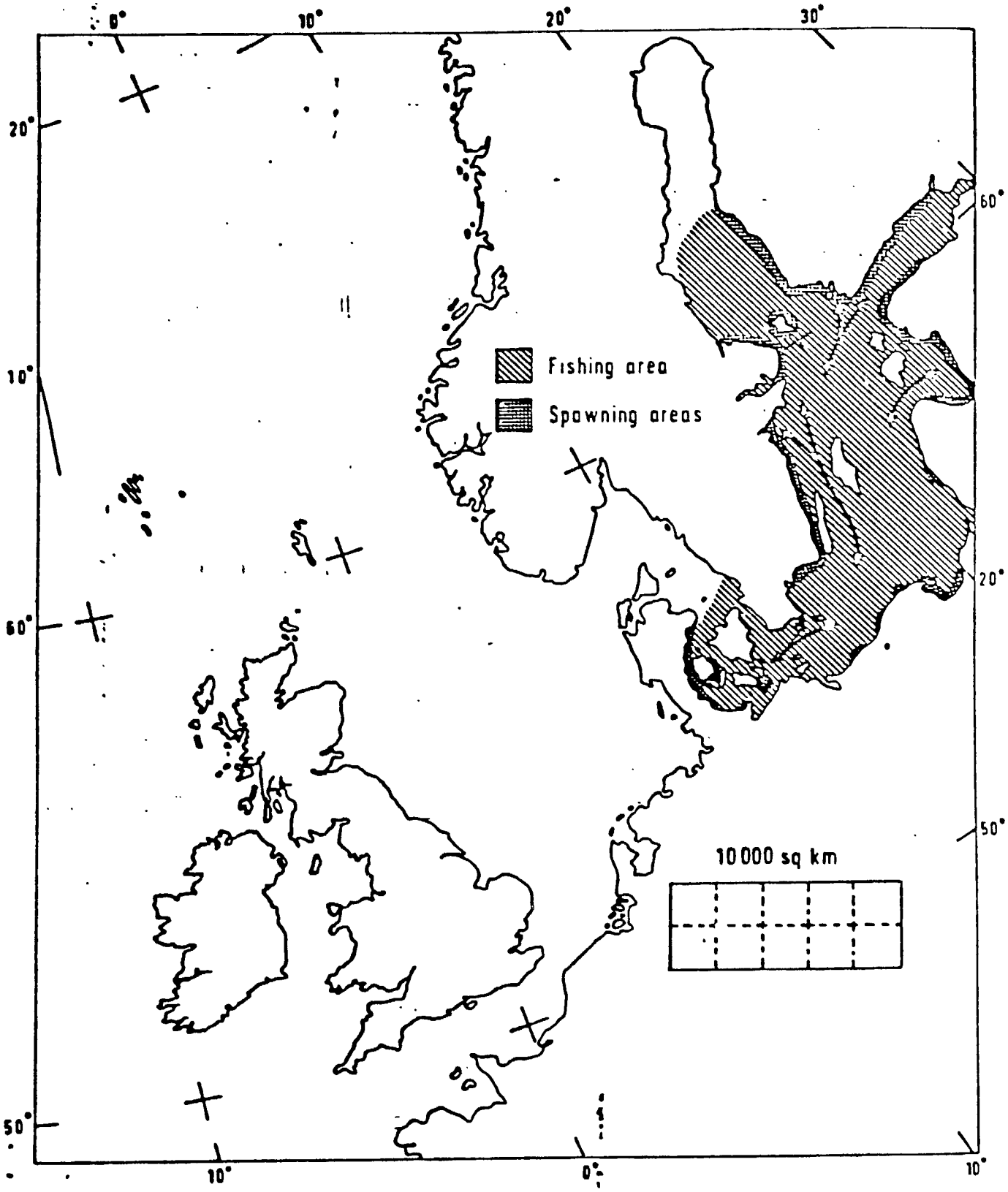
HERRING NORTH SEA AND IRISH SEA



APPENDIX III

Figure 5

BALTIC HERRING - FISHING AND SPAWNING AREAS



APPENDIX III

Figure 6

NORTH SEA LANDINGS, ALL COUNTRIES

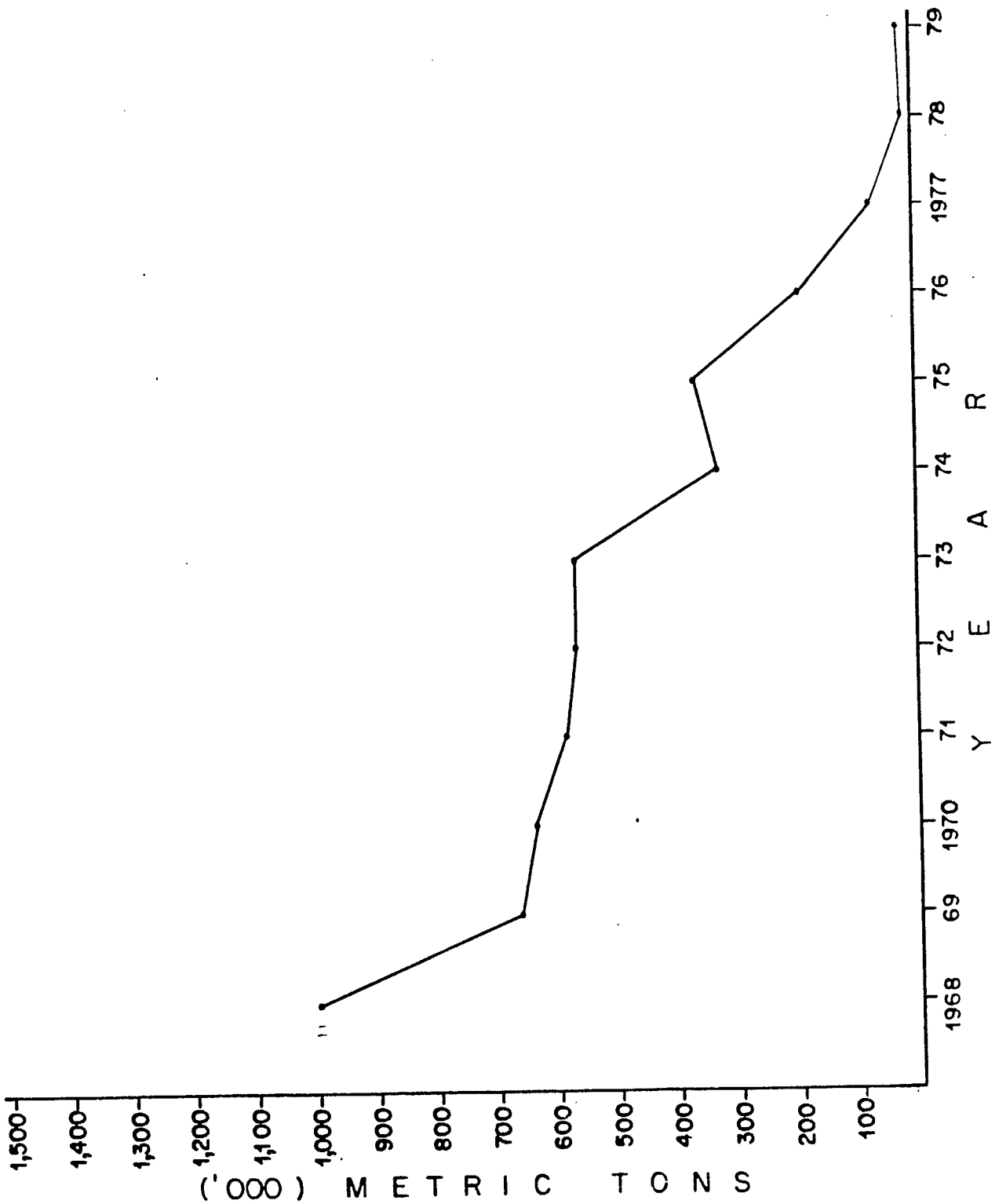
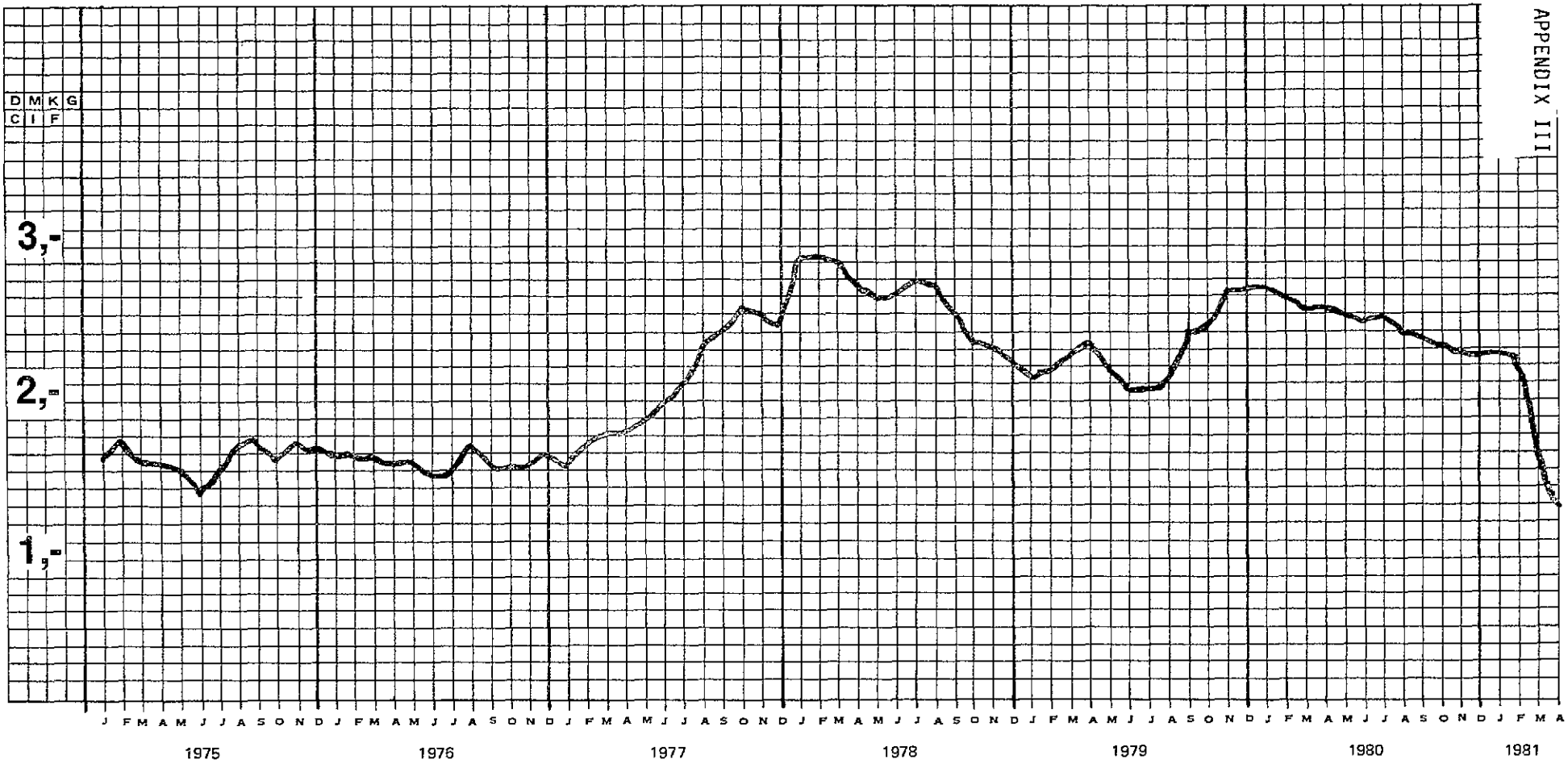


Figure 7

GERMAN IMPORT PRICES OF FROZEN BUTTERFLY FILLETS

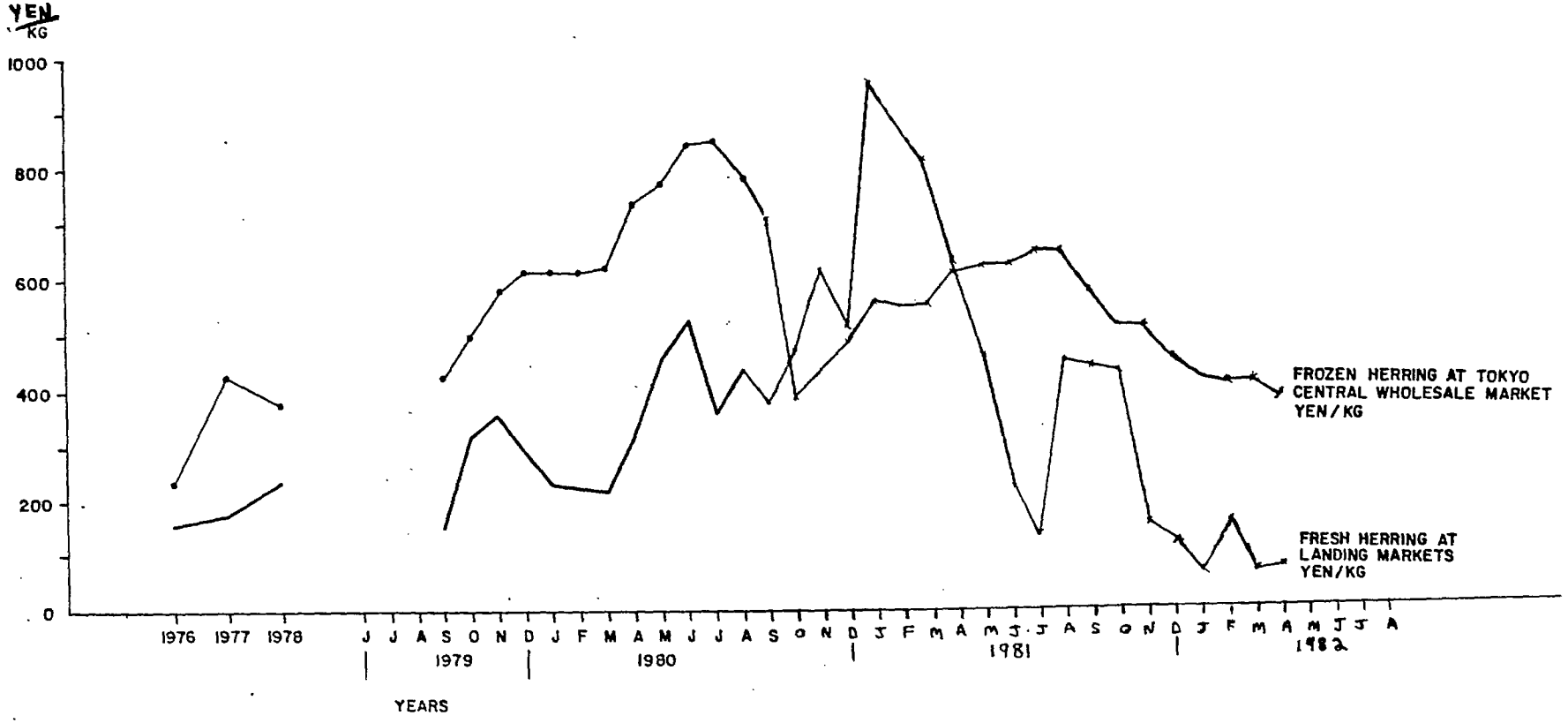
CIF Northern Germany; 8/12 per kg.
Courtesy Rietdorf & Maxein, Hamburg



x) Mostly second qualities

APPENDIX III

Figure 8
HERRING PRICES IN JAPAN - 1976-1982



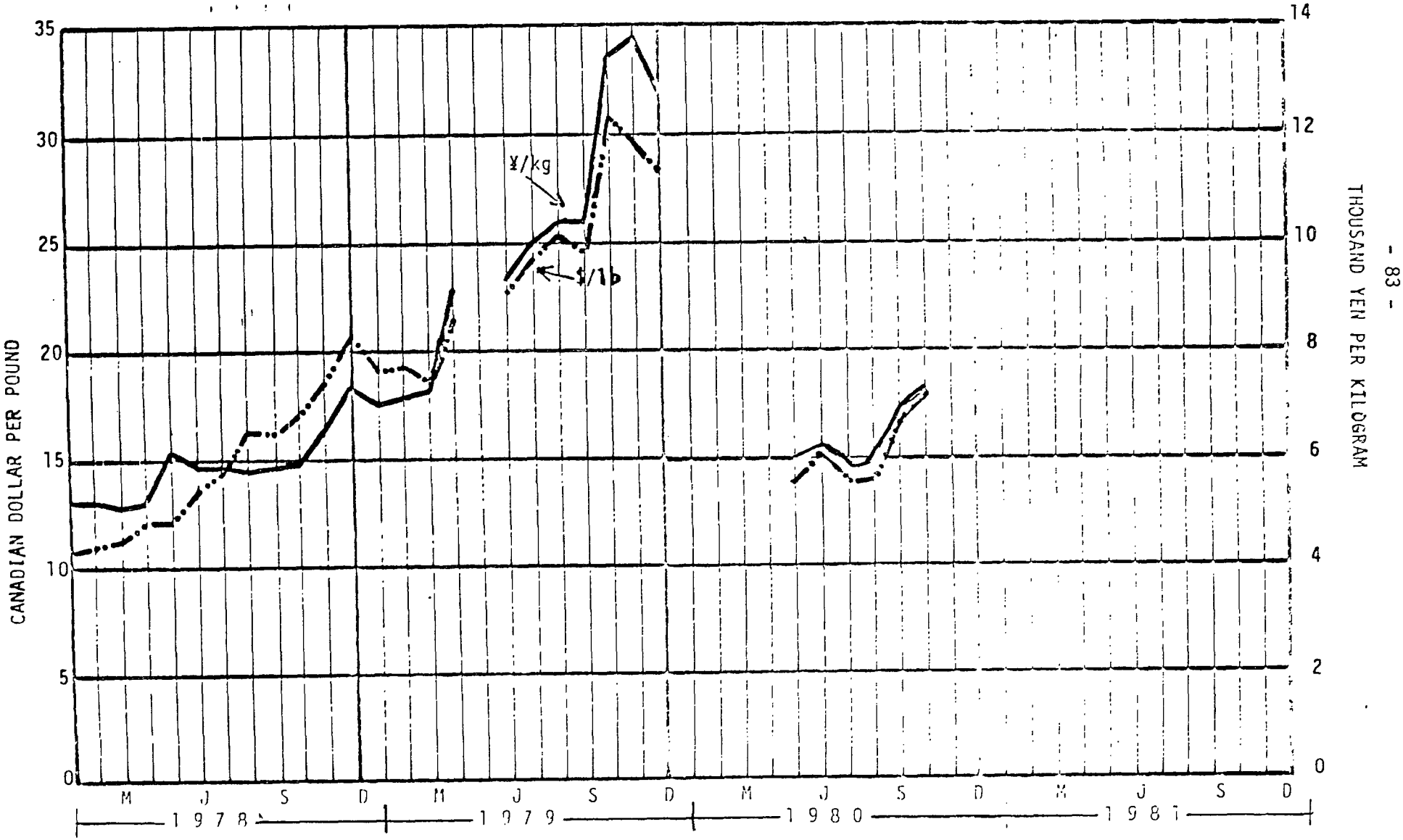
SOURCE: GOVERNMENT OF JAPAN, M.O.A.F.F., MONTHLY STATISTICS OF AGRICULTURE, FORESTRY AND FISHERIES, DEC. 1980.

APPENDIX III

Figure 9

MID-MONTH PRODUCER/WHOLESALER SELLING PRICE OF HERRING ROE, TOKYO CENTRAL MARKET, 1978-80

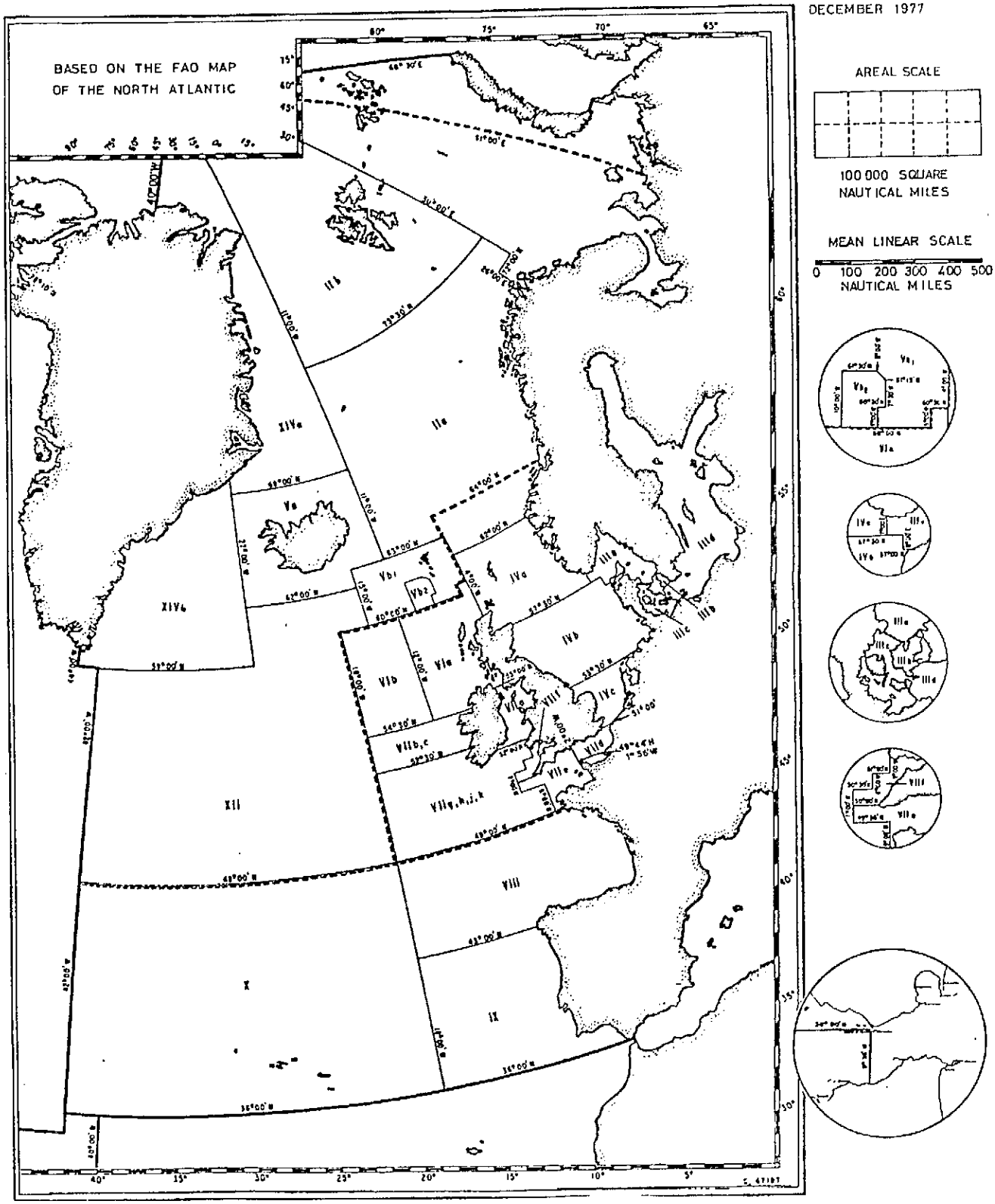
(Wholesale price after reprocessing and consumer packaging.
Large size 10-12 cm, unbroken, 20/30 g per piece)



APPENDIX III

Figure 10

ICES FISHING AREAS



APPENDIX IV

HERRING PRODUCTS[1]

In the following pages some of the primary products from herring are listed together with some of the consumer products marketed in various countries.

Appetitsild: skinned fillets of spice-cured small herring or sprats packed in vinegar, salt, sugar and spices.

Bismarck herring: fillets or headed and gutted herring, vinegar and salt cured, then packed in a milder vinegar-salt solution with slices of onions, cucumbers, carrots and spices, also with sugar added; semi-preserved.

Bloater: a) in Canada a heavily salted and smoked whole herring, smoked a minimum of five weeks; similar to red herring;

b) UK and Europe - Large, whole ungutted fat salted herring, cold or hot smoked to a straw colour.

Bratbückling: small herring, lightly cured in brine, cold smoked, fried before eating.

Brathering (Germany): headed and gutted fried herring in vinegar brine, also packed as fillets or pieces, semi-preserved.

Bratrollmops (Germany): rolled fried herring or herring fillets without tail or bones with pickles, slices of onions, etc., and fastened with small sticks or cloves, in vinegar brine, semi-preserved or pasteurized.

Bückling: fat herring, sometimes headed or nobbed, lightly salted and hot smoked.

---

1 Principal source: Multilingual Dictionary of Fish and Fish Products, Organization for Economic Cooperation and Development. 2nd edition (1978). Published by Fishing News Books Limited, Farnham, Surrey, England.

Butterfly fillets: (flaps) double fillet joined in belly section, backbone, tail and head removed.

Digby chick: heavily salted and smoked small herring prepared at Digby, NS

Dressed: headed and gutted.

Dutch-Cured: herring gibbed and salted on board, re-packed ashore.

Gaffelbiter: sugar or spice cured fat herring, fillets cut into "tidbit" pieces, packed in spiced brine, or vinegar or sauces flavored with wine, dill, etc.

Gibbing: the process of removing the gills, guts and stomach from the herring; the milt, roe and some of the pyloric ceca are left in the fish.

Golden cure: milder type of red herring that is smoked only for five or six days instead of several weeks. Also called Mediterranean cure.

Hard cure (pickled): whole, nobbed, gibbed, gutted or fillets; salted with 25% to 33% of its weight in salt. (Salt content in tissues above 24%).

Hareng saur (France): salted herring, partially desalted and cold smoked ("gendarme").

Kipper. fat herring, split down the back from the head to tail, lightly brined and cold smoked; kippered fillets are also canned in brine or oil and marketed as kipper snacks.

Klondyked herring (UK): fresh, ungutted herring preserved for a few days by sprinkling with ice and salt.

Maatje cure: 1. Young fat herring, mild cured (salted);
2. Germany - gibbed, fat herring, lightly cured with salt, sugar and sometimes saltpetre, used as raw material for maatjes Fillets;
3. in Sweden the term "matjesfileer" in also used to designate fillets and tidbits of sugar-cured Icelandic or Canadian herring.

Nobbed: head removed, stomach and intestines pulled out: roe and milt left in, belly not cut.

Red herring: whole, ungutted herring, heavily salted and cold smoked for two or three weeks until hard.

Rollmops: marinated herring fillets wrapped around pickle or slices of onion and fastened with sticks or cloves; packed with mild vinegar brine, spices, etc., also mayonnaise, remoulade or other sauces with various flavors.

Sauerlappen (Germany): vinegar and salt cured fillets used as raw material for various products.

Scotch Cured: fresh herring, free from feed, unwashed, gibbed, mixed with salt and packed in barrels, mild cured in their own pickle (90% brine) not repacked; limited keeping quality.

Spice Cured: herring, usually nobbed, cured with salt, sugar and spices; spice-cured sprats are used for Scandinavian anchovies (ansjos) products.

Split: backbone left in, split from back, tail and usually head left on.

Steaked: cut in pieces at right angles to the backbone.

Sugar-cured: herring cured with a mixture of salt and sugar.

Vinegar-cured: fillets or dressed herring preserved in various mixtures of vinegar and salt.