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Policy For Canada's Commercial Fisheries

May, 1976

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CANADA'S COMMERCIAL
FISHERIES

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Fisheries and Marine Service,
Department of the Environment,
Ottawa, Canada

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Foreword

Since late 1974 the government of Canada has been taking a fresh look at current problems of Canada's commercial fisheries. We have been looking for ways to solve these problems and then to create a healthy, stable industry; one which can bring prosperity and security to the people in it.

We made this study not only because of the acute economic crisis which afflicted the industry over the past 18 months but also because it is time to prepare for the extension of Canadian jurisdiction over what could, with wise management, become one of the richest fishing areas in the world.

As a result of this study, I presented to the government in mid-1975 an overall plan for managing and developing the fisheries. This plan has now been adopted as government policy: it has become a guide for the rebuilding of Canada's commercial fisheries over the next ten years.

It is important that everyone in the industry: fishermen, processors, distributors, suppliers, investors - as well as consumers and other interested citizens - understand the plan and the reasoning behind it; including the problems it has been designed to deal with. In describing these previous troubles we are not being pessimistic; in the recognition of problems lies the beginning of solutions.

Although most of this report deals with the problems of the sea fisheries, the principles evolved apply generally to the freshwater fisheries as well. We are, right now, working with the governments of the central provinces, to which administration of freshwater fisheries has been delegated, to make plans for the best use - commercial as well as recreational - of our freshwater fish resources.

Apart from transmitting information about the government's plan of action, this booklet has another purpose: to enlist the cooperation of Canadians, particularly those in the industry, in designing the many programs needed to translate policy into action. Work has begun in a number of areas. We shall be seeking advice on the programs with the people who will be affected by them.

If you want more information than this booklet contains, or if you need additional copies of it, please write or phone the nearest regional office of the Fisheries and Marine Service (see the back cover) or write:

Information Branch
Fisheries and Marine Service
Department of the Environment
580 Booth Street
Ottawa, Ontario
K1A 0H3

I hope too that this booklet will stimulate comment from readers.

If you do have comments please feel free to write me.

A handwritten signature in black ink, reading "Roméo LeBlanc". The signature is written in a cursive style with a long horizontal stroke at the end.

Roméo LeBlanc
Minister of State for Fisheries

House of Commons
Ottawa, Ontario
April, 1976

INTRODUCTION

In 1975 the federal government decided on a new approach to fisheries management and development, one aimed at revitalizing all branches of Canada's commercial fisheries.

This decision has implications for the whole country. In large areas of the country the fisheries are the principal industry. With the impending advent of extended coastal-state jurisdiction, the industry can play an even greater part in Canada's economic and social development.

The importance the federal government attaches to the fisheries is reflected in the amount of money spent on them in recent years. For the period July, 1974 - March, 1977, the government allocated approximately \$130 million for special aid to the fisheries. (By March, 1976, about \$65 million had been spent.) This was in addition to normal expenditures estimated at more than \$200 million per year, by federal and provincial governments. Some special expenditure may be expected to continue, though on a reduced scale until the measures now being planned result in the emergence of an industry that can stand on its own feet.

Such large-scale expenditure demonstrates how seriously weakened the fishing industry is. Without special assistance over the past year, many elements of the industry (including some of the leading firms) would have collapsed. Most of the special aid was provided for that section of the industry which depends on exports of frozen groundfish (cod, flatfish, ocean perch, and similar "whitefish" species). This part of the industry has run into severe marketing difficulties at intervals of approximately six years. Although some parts of the industry are well-off, the fishing industry has through the years failed to yield to its participants the kind of reward that similar effort yields in other occupations.

CANADA'S POSITION IN WORLD FISHERY PRODUCTION, 1973

<u>COUNTRY</u> ^{1/}	<u>NOMINAL CATCH</u> ^{2/} metric tons
Japan	10,700,000
U.S.S.R.	8,600,000
China	7,600,000
Norway	3,000,000
U.S.A.	2,700,000
Peru	2,300,000
India	2,000,000
Thailand	1,700,000
Republic of Korea	1,600,000
Spain	1,600,000
Denmark	1,500,000
South Africa	1,300,000
Indonesia	1,300,000
Philippines	1,200,000
<u>Canada</u>	1,200,000
United Kingdom	1,100,000
All others	16,300,000
Total	65,700,000

1/ The countries listed by name are those producing one million metric tons or more

2/ Landings, in whatever form, converted to "round" (live) weight.

Source: FAO, Yearbook of Fishery Statistics, Vol. 36, 1974

The extension of Canada's fisheries jurisdiction will not, by itself, solve the industry's problems. Even before the recent growth of foreign fishing off our coasts, there were major problems in areas already under Canadian jurisdiction, for example some lake fisheries and some Gulf of St. Lawrence fisheries. Canadian fleets have shown that they too can overcrowd fishing grounds and deplete fish stocks. In any case, the state of the resource (i.e. the fish) is only one of many factors that influence the health of the industry. In 1973, a year when the stocks were becoming depleted, the groundfish industry registered one of its best years ever, in economic terms. In the following year, markets deteriorated, costs rose steeply, and the roof fell in.

Extended jurisdiction, then, should be seen as being as much a challenge as an opportunity, and in facing up to that challenge we should always keep in mind that the fortunes of the fishing industry depend on more than fish. They depend on markets, on production costs, on the industry's built-in ability to compete, and on a myriad other factors. Many of the problems are inherent in the industry's structure. Too often the fishing industry has been unstable and self-debilitating, prone to crises, and providing an inadequate and nearly always insecure source of income to those who work in it.

When in 1974 it became clear that large sections of the industry would probably collapse, the Minister of State for Fisheries launched the most thorough inquiry yet made into Canada's post-war fishing industry. Experts from government and the private sector consulted with people in every part of the industry. The resulting analysis of the industry's problems has been generally accepted in the industry and in government. From this analysis have come the interim special aid programs that have kept stricken sections of the industry afloat during the present crisis.

CANADA'S POSITION IN THE WORLD'S FISH TRADE, 1973

<u>Country</u> ^{1/}	<u>Exports</u>
	\$ U.S.
Japan	553,900,000
Norway	514,000,000
<u>Canada</u>	490,700,000
Denmark	377,200,000
U.S.A.	285,200,000
Iceland	212,700,000
Netherlands	207,900,000
Spain	169,200,000
Peru	152,500,000
Republic of Korea	145,500,000
Federal Republic of Germany	139,300,000
U.S.S.R.	122,700,000
United Kingdom	133,800,000
Australia	104,100,000
All others	644,300,000
Total	5,233,000,000

1/ The countries listed by name are those exporting fishery products to a value of one hundred million dollars (U.S.) or more.

Source: FAO, Yearbook of Fishery Statistics, Vol. 37, 1974

The study produced a set of strategies recommended for the rehabilitation and reconstruction of the industry over the long haul. Like the problems they address, these initiatives are interlinked and overlapping. They have a common aim: the creation of a climate of prosperity and security for all who participate in the commercial fisheries.

The crisis which gave rise to this study affected primarily the groundfishery of the Atlantic coast, and research was concentrated in that region. As a result, the analytical content of this report to the public acquired a perceptible down-east flavour. Nevertheless, the policy objectives and strategies formulated are intended to be applicable generally throughout all fisheries and fishing regions of the country. In the design and implementation of programs, of course, account will be taken of variation from place to place in the relevance of specific strategies.

The strategies adopted reflect a fundamental redirection in the government's policy for fishery management and development. Although commercial fishing has long been a highly regulated activity in Canada, the object of regulation has, with rare exception, been protection of the renewable resource. In other words, fishing has been regulated in the interest of the fish. In the future it is to be regulated in the interest of the people who depend on the fishing industry. Implicit in the new orientation is more direct intervention by government in controlling the use of fishery resources, from the water to the table, and also more direct participation by the people affected in the formulation and implementation of fishery policy.

THE COMMERCIAL FISHERIES IN CANADIAN SOCIETY

Structure and Dimensions*

Many parts of Canada depend on the commercial fisheries. This dependence is absolute in many places, including some where the fishing industry is economically weak.

The Atlantic region (including Newfoundland, the Maritimes and the coastal areas of Quebec) depends heavily on fishing. About 75 per cent of the communities in this region take part in commercial fishing. Of these communities, some 20 per cent (roughly 250,000 people) have no other economic base.

Relatively speaking the Pacific area is less dependent on the fisheries. Much of the industry is centered in Prince Rupert and Vancouver. In both areas there are other ways to make a living - certainly more than in most parts of the Atlantic coast. Nevertheless many isolated coastal communities, and a significant sector of the Pacific coast's economy depend on fisheries and fishery-related industry and services.

Nearly as many people work in the freshwater fisheries of Canada as in the sea fisheries of the Pacific coast. Dependence on fishing is especially high in some Indian communities of the Northwest Territories, in the northern parts of Manitoba, Saskatchewan and Alberta, and in northwestern Ontario.

There are an estimated 20,000 fishing enterprises in the primary sector of the commercial fisheries in Canada. These enterprises operate about 40,000 fishing craft of all types and sizes, and employ between 55,000 and 60,000 fishermen as owner/operators and crew. The investment in these operations currently approximates \$375 million, 90 per cent of which is in fishing craft.

* Appendix II contains a series of 20 tables providing additional detailed information on various aspects of Canadian fisheries.

The Primary Fishing Industry in Canada ^{1/}1973

	<u>Pacific</u> <u>Region</u> ^{2/} no.	<u>Central</u> <u>Region</u> ^{3/} no.	<u>Atlantic</u> <u>Region</u> ^{4/} no.	<u>All</u> <u>Canada</u> no.
Communities ^{5/}	N/A	N/A	700	N/A
Bases ^{6/}	N/A	N/A	2,100	N/A
Landing Points	N/A	N/A	1,700	N/A
Enterprises ^{7/}	3,000	2,000	15,000	20,000
Fishing Craft	6,600	N/A	28,900	N/A
Employment ^{8/}				
Full-time	N/A	N/A	5,300	N/A
Part-time	N/A	N/A	13,200	N/A
Occasional	N/A	N/A	20,500	N/A
Total	11,700	8,000	39,000	58,700
Investment - ^{9/}	\$ million	\$ million	\$ million	\$ million
Craft	142.5	5.8	189.2	337.5
Gear	6.4	N/A	29.8	N/A
Total	148.9	N/A	219.0	N/A
Production -	metric tons	metric tons	metric tons	metric tons
Nominal Catch ^{10/}	183,800	45,500	888,500	1,117.8
Value of Landings ^{11/}	\$ million 13.4	\$ million 19.1	\$ million 171.1	\$ million 320.6
Average Gross Income Per Man ^{12/}	\$	\$	\$	\$
Mode {	Total, all sources 4,300	3,700	3,600	3,700
{	Proportion from %	%	%	%
{	fishing 45	30	40	40
Mean {	Total, all sources 12,800	5,900	5,100	6,900
{	Proportion from %	%	%	%
{	fishing 70	40	50	60

1/ Source: Annual Statistical Review of Canadian Fisheries, Vol.7, 1974, except as otherwise noted. 2/ Includes British Columbia and the Yukon. 3/ Includes the Northwest Territories, the three Prairie Provinces and Ontario. 4/ Includes Quebec, the three Maritime Provinces and Newfoundland. 5/ As defined for Census purposes, i.e. including groups of settlements in some cases. 6/ Settlements from which fishing operations are conducted. 7/ Estimated from earlier Census data. 8/ Fishermen are classified as "full-time" if they are engaged in fishing for at least ten months a year, as "part-time" if engaged for five to ten months and as "occasional" if engaged for less than five months. 9/ The data represent an estimate of the depreciated value of vessels and boats and the annual expenditure on gear. 10/ The calculated live-weight equivalent of the quantity, in whatever form, actually brought ashore. 11/ Based mainly on prices at first sale. 12/ A calculation based on taxation returns from filers (numbering 31,700) claiming fishing as their main source of income.

For the most part the Canadian fishing fleet is a small-craft fleet. Even in the sea fisheries, over 95 per cent of the boats are under 25 gross tons and generally they stay within a day's voyage of home port. Most by far are owner-operated, the principal exceptions being about 250 larger vessels (generally 100 feet and up in length) owned by vertically integrated enterprises that catch, process, and trade fish on the Atlantic coast. Working chiefly in the groundfish, herring and scallop fisheries, these boats make up perhaps half the total investment in the Atlantic coast fleets and they take roughly half the regional catch. In other regions and fisheries "vertical integration" is much less significant.

Although by head-count the number of fishermen is over 55,000, the fulltime man-years involved are probably less than 30,000. In the majority of cases fishermen, especially in seasonal fisheries, have other part-time jobs. In parts of the Maritimes, for example, the fisherman/farmer/logger combination is common. Although the proportion has declined, a few fishermen still process their catch themselves and in some cases sell their fish directly to consumers.

The incomes of commercial fishermen tend generally to be low but the variation, between and within regions, is extremely wide. In Canada as a whole, 50 per cent of all fishermen are found to earn less than \$5,000 (gross) each year from all sources. Only 20 per cent of fishermen in the Pacific region fall into this bracket. In that region, slightly over 50 per cent of fishermen earn more than \$10,000 per year - almost 45 per cent do better than \$12,000.

The Central region conforms with the national average, that is, 50 per cent of fishermen there earn less than \$5,000 per year. In the Atlantic region the proportion of fishermen earning less than \$5,000 per year is 60 per cent. In these two regions, the proportion earning upwards of \$10,000 drops to 15 per cent and seven per cent, respectively, varying among Atlantic provinces between 12 and two per cent.

A striking feature of fishermen's income is how little of the income earned by those in the lower brackets comes from fishing. In Canada as a whole, it is only when average gross income from all sources reaches \$6,500 to \$7,000 that income from fishing begins to account for more than half of the fisherman's total income. In some areas (e.g. British Columbia and Nova Scotia) specialization in fishing takes place at a lower level (\$5,500 - \$6,000). In others, Newfoundland for example, it occurs higher (\$9,500 - \$10,000). Above \$10,000, income from fishing begins to exceed 75 per cent of the fisherman's total income in every part of Canada except the Central region and areas bordering the Gulf of St. Lawrence in the Atlantic region.

These figures reflect the presence in the fisheries of many part-time and occasional participants, especially in the Atlantic provinces. In this connection it may be observed that although there are three times as many fishermen in the Atlantic region as there are in the Pacific, the gross value of the Atlantic region's primary production is a bit less than one third higher than the Pacific value. In other words, in terms of landed value, manpower in the Pacific fisheries is 2.5 times as productive as manpower in the Atlantic fisheries.

There are approximately 650 processing plants, of all types and scale of operation, in the secondary sector of the commercial fisheries. The number of "manufacturing establishments" as defined by Statistics Canada is 330 (see footnote, p. 11). Average monthly employment, that is, total man-years, in the latter group is just over 21,000, almost 90 per cent being in production and the rest in sales and administration. Slightly more than one third of this work force are women. Seventy per cent of establishments employ less than 50 people and only one per cent employ more than 500. Production from these establishments is valued at about \$620 million, and the total production of the sector, including fish without significant change in form, at about \$785 million (1973).

The Fish-Processing Industry in Canada ^{1/}

1973

	<u>Pacific</u> <u>Region</u> ^{2/} no.	<u>Central</u> <u>Region</u> ^{2/} no.	<u>Atlantic</u> <u>Region</u> ^{2/} no.	<u>All</u> <u>Canada</u> no.
Plants ^{3/}	105	145	405	655
Establishments ^{4/}	45	30	255	330
Employment ^{5/} -				
Production { male	1,600	500	9,700	11,800
{ female	1,400	500	5,300	7,200
Other ^{6/} { male	500	100	1,100	1,700
{ female	200	Ø	500	700
Total	3,700	1,100	16,600	21,400
Payroll -	\$ million	\$ million	\$ million	\$ million
Production workers	23.4	6.2	65.3	94.9
Other Staff ^{6/}	6.5	1.8	12.3	20.6
Total	29.9	8.0	77.6	115.5
Purchases -				
Materials & Supplies ^{7/}	150.7	26.9	193.7	371.3
Services ^{8/}	1.1	0.3	6.2	7.6
Total	151.8	27.2	199.9	378.9
Value Added ^{9/}	98.5	15.8	166.1	280.4
Output ^{10/}	236.5	41.5	343.4	621.4
Sectoral Production ^{11/}	285.0	38.5	462.7	786.2

1/ Source: Statistics Canada, Fish Products Industry, 1973, except as otherwise noted. 2/ See preceding table for definition of regions. 3/ These data are derived from a registry of fish-processing operations maintained by the inspection branch of the Fisheries & Marine Service, DOE. 4/ An establishment is defined in the Census of Manufacturing as "the smallest operating unit capable of reporting certain specified input and output data." Packing plants and other facilities where fish do not undergo a change of form are not included in this group. The total number of units in the group varies considerably from year to year, averaging 360 on a slowly declining trend over the past decade - hence the rounding here to the nearest five. 5/ This represents the monthly average for the year. 6/ The group comprises sales and administrative personnel. 7/ Purchases of raw fish, amounting to 85-90 per cent of the primary industry's output, would account for approximately 75 per cent of the total, the balance being made up of packaging and other processing materials. 8/ These are chiefly energy purchases, i.e. fuel and electricity.

9/ This includes the value added in distribution and other operations as well as in processing strictly defined. 10/ Output represents "the value of shipments of goods of own manufacture". 11/ The difference between this and the preceding row represents the output of untransformed products, e.g. live lobsters, shell oysters and the like. The discrepancy in the case of the Central Region is not explained.

Fishing and fish-processing provide less than one per cent of Canada's total employment. Leaving out processing and marketing, fishing itself provides less than one half of one per cent of the Gross Domestic Product. However, in certain regions of the country fishing is tremendously important, both economically and socially. In Newfoundland, for example, nearly 15 per cent of the labour force is employed in fishing and processing. The industry's influence is pervasive: for every job created or lost in fishing, 0.4 jobs are created or lost elsewhere in the Province; for fish processing, the ratio is one to 1.8. In Nova Scotia (where the fish business accounts for 10 to 15 per cent of value added in all commodity production) these ratios are even higher, at 0.7 and 2.3. In terms of how each dollar of industry output affects provincial household income, only parts of the forest industry have greater impact in the province. The fishing industry has strong links with ship-building and service industries in this and other regions of the country. The fisheries are the sole reason for the existence of many coastal communities. If they were to fail, the economy of the area would founder and the people involved would be forced to migrate.

The industry will almost certainly become more significant for these regions and the nation. Canada's fishermen have closest access to what are, potentially, some of the world's most productive fishing grounds, and to some of the world's richest markets. When the area of national fisheries jurisdiction is extended, the availability of fish to Canadian fishermen will be improved. A fully-developed fishery based on nearby shores is capable of greater efficiency than a distant-water fishery and this improved performance would benefit the world at large. To establish a firm foundation for that full development, restructuring of the industry and trade is necessary.

THE COMMERCIAL FISHERIES IN THE NATIONAL AND REGIONAL ECONOMIES^{1/}

		<u>All Canada</u>	<u>Pacific Region</u>	<u>Central Region</u>	<u>Atlantic Region</u>	<u>Atlantic Provinces^{2/}</u>	<u>Nova Scotia</u>	<u>New- foundland</u>
Employment (1973):								
Total	thousand	8,816	942	4,821	3,053	678	261	159
Fisheries ^{3/}	(thousand	80	15	9	56	49	16	21
	(%	0.9	1.6	0.2	1.8	7.2	6.1	13.2
Value Added (1972):								
All Industry ^{4/}	\$million	43,364	4,655	26,199	12,396	2,251	840	612
Fisheries ^{3/}	(\$million	428	127	30	269	246	113	77
	(%	1.0	2.7	0.1	2.2	10.9	13.5	12.6
Contribution to Gross Product (1972): ^{5/}	%	N/A	N/A	N/A	N/A	3.6	3.8	5.1

^{1/} Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974, except as otherwise noted.

^{2/} The Atlantic Region excluding Quebec province.

^{3/} Including both primary and secondary sectors.

^{4/} Commodity-producing industries collectively.

^{5/} Data compiled by Analysis & Liaison Branch, DREE.

The Fish Trade

The commercial fisheries in Canada always have been highly export-oriented. At present approximately two-thirds of total fishery production is exported, and this country is among the leading nations in the international fish trade. Product groups are differentiated to a considerable extent according to market area. Fresh and frozen products are exported almost exclusively to the U.S.A., for example, cured products mainly to the Caribbean and southern Europe and canned products largely to western Europe. Although exports in total are destined for a wide range of countries, and trade diversification has improved in recent years, three or four markets are still dominant. About 60 per cent of all Canadian fish exports (nearly 40 per cent of total production) goes to the U.S. market alone. The sources of fish imports into Canada are similarly concentrated but that is of minor significance.

Fishery products of Canadian origin, occasionally from residual supplies, satisfy about 70 per cent of the requirements of the domestic market - the balance being provided by imports of species (such as tuna and shrimp) not found in great abundance in home waters. The per capita annual consumption of fish in Canada, as in the U.S.A., has remained low (at roughly 12 pounds or 5.5 kg., about 1/20 that of red meat and poultry combined) and relatively constant since at least the 1940s. Sales promotion and the introduction of new products have brought about some shifts in consumer preference but have not raised demand. The fact that consumption of fish is higher in coastal and lake shore areas than elsewhere, and higher in urban than in rural areas, suggests that proximity to the water or a fish shop (and the early acquisition of a taste) chiefly determines the frequency of fish on the table.

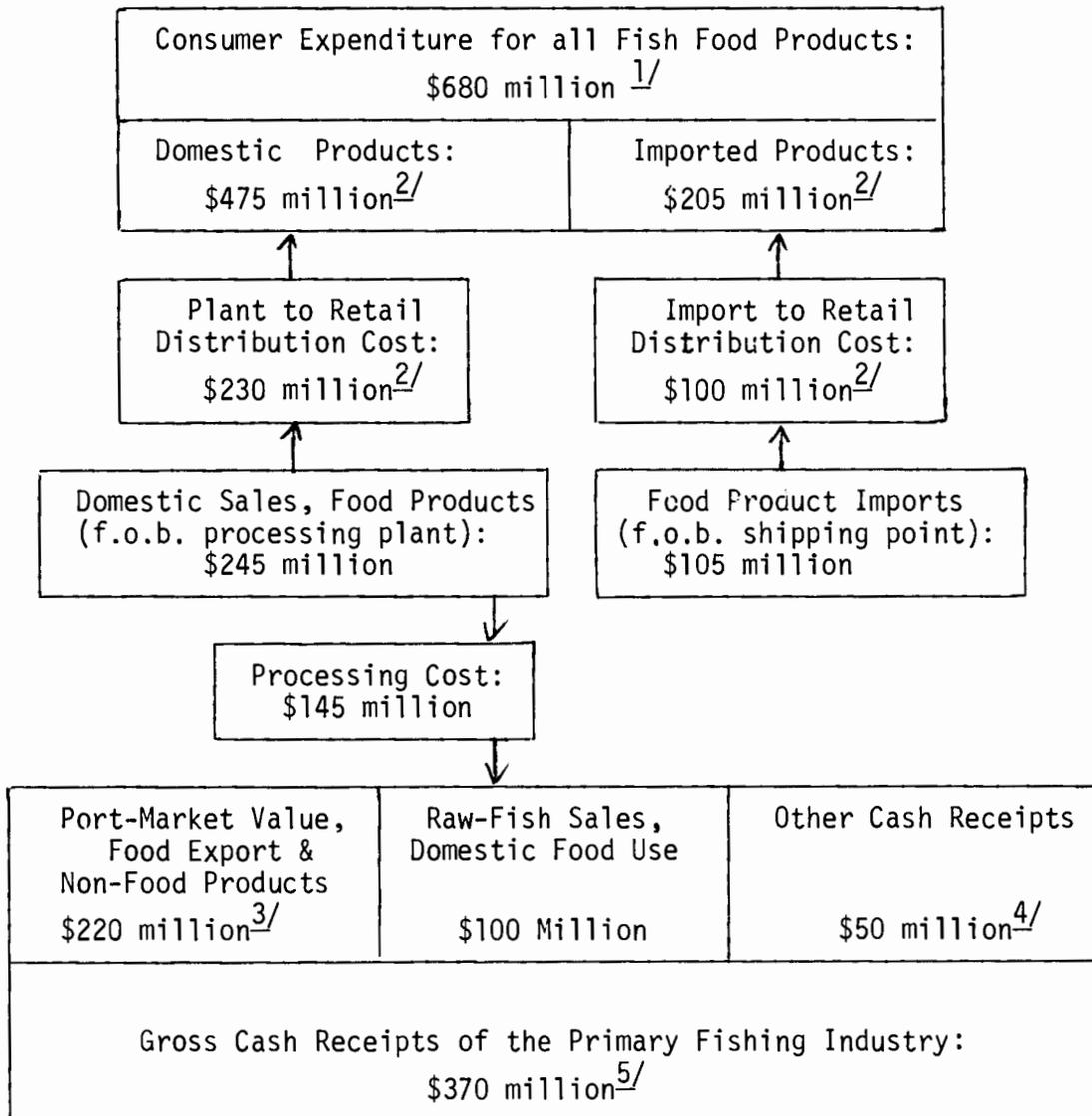
Canada's Foreign Trade in Fishery Products1973

<u>Country</u> <u>of Destination or Origin</u> ^{1/}	<u>Canadian Exports</u>		<u>Canadian Imports</u>	
	\$ million	%	\$ million	%
U. S. A.	294.1	59.0	54.2	48.7
Japan	57.1	11.4	27.8	25.0
U. K.	54.4	10.9	1.9	1.7
France	16.8	3.3	1.0	0.9
Sweden	9.7	1.9	Ø	Ø
Belgium - Luxembourg	9.7	1.9	Ø	Ø
Federal Republic of Germany	8.8	1.7	Ø	Ø
Puerto Rico	5.5	1.1	Ø	Ø
Netherlands	4.8	1.0	2.5	2.2
Denmark	4.3	0.9	1.3	1.2
New Zealand	4.3	0.9	Ø	Ø
Jamaica	3.7	0.8	Ø	Ø
Australia	3.4	0.7	Ø	Ø
Italy	2.8	0.6	Ø	Ø
South Korea	2.7	0.5	Ø	Ø
Norway	2.1	0.4	2.8	2.5
Trinidad-Tobago	1.8	0.4	Ø	Ø
Dominican Republic	1.4	0.3	Ø	Ø
South Africa	1.0	0.2	Ø	Ø
Cuba	Ø	Ø	7.2	6.5
Portugal	Ø	Ø	2.7	2.4
Mexico	Ø	Ø	2.5	2.2
Hong Kong	Ø	Ø	1.6	1.4
Peru	Ø	Ø	1.1	1.0
All Others	11.3	2.1	4.7	4.3
Total	498.7	100.0	111.3	100.0

^{1/} Countries listed are those importing from or exporting to Canada fishery products valued at \$ one million or more.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

Interrelationships
Between Consumer Food Expenditures and Primary-Fishery Cash Receipts,
Canada 1973
 (provisional estimate)



1/ Excluding direct consumption by commercial fishermen's and anglers' households.

2/ Calculated on the basis of general food storage charges and markups and, therefore, probably an underestimate. 3/ The value of landings used directly for the preparation of industrial products (meal, oil, etc.) in 1973 exceeded \$10 million. The output of such products in that year was valued at \$30 million, but this included by-products from food processing as well. Exports of food products and of industrial products in 1973 approximated \$480 million and \$20 million, respectively. 4/ A rough estimate of aggregate grants, bounties, charter payments and income supplementation in the form of net receipts by seasonally-engaged fishermen from the UIC. Bonus payments, received by some fishermen from buyers of their catch, are not capable of estimate at present.

5/ The total includes the "boat share" in vertically-integrated fishing enterprises, which accrues to owners and thus is not a component of fishermen's earnings. It might amount to \$50 million as a first approximation.

Source: calculations are based on data in Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

Although the quantity of fishery products sold in Canada is but slightly more than one half the quantity exported, products sold at home acquire added value in the Canadian economy through transport, storage and resale. Thus the value of these products in retail, over-the-counter terms, equals or exceeds the value of fishery exports from Canada. Calculated on this basis, the annual output of the Canadian fishing industry and fish trade now is approximately one billion dollars, roughly 90 per cent of which is accounted for by food products and the remainder by a miscellaneous group of industrial products.

Social Dimensions

Over two-thirds of the people who work in the fishing industry live in the five Atlantic coast provinces. In these provinces, household income tends to be lower in fishing communities than in the region generally. There are exceptions: for example some parts of southwestern Nova Scotia and southern New Brunswick that depend heavily on fisheries, are relatively well-off. Nevertheless the general rule is that the more the community depends on fishing, the lower its average income tends to be. In Newfoundland the average household income was \$7,200 in 1971. For communities with some involvement in fishing it was \$5,600. For communities in which the fisheries industry was the major employer it was \$4,900.

Communities suffering worst from chronically low income tend to be those that depend on local small-boat fisheries. The causes of poverty in such areas are well known: dependence on fishing/farming/logging combinations and on non-monetary income, a relative lack of mobility, under-capitalization per enterprise and, in recent years, diminishing catches. Often the fishermen in these communities are older and less able to move from job to job. Tradition, a scarcity of choices and opportunities and, in some cases, an over-commitment of social resources frequently tend to immobilize fishermen in these places.

The Atlantic Region:
Fishery-Dependent Communities, 1971

<u>Specialization</u> Index ^{1/}	<u>Provincial Distribution</u>					
	<u>Qué</u> no.	<u>N.B.</u> no.	<u>P.E.I.</u> no.	<u>N.S.</u> no.	<u>Nfld.</u> no.	<u>Region</u> no.
.30 - .39	4	14	11	4	31	64
.40 - .49	3	3	3	3	25	37
.50 - .59	2	1	1	1	20	25
.60 - .69	1		1		7	9
.70 - .79					6	6
.80 - .89					1	1
High-Dependence Communities ^{2/}	10	18	16	8	90	142
All Dependent Communities ^{2/}	112	136	94	87	273	702
Total Fishing Settlements ^{3/}	252	302	207	765	615	2,141

Fishery-Based Household Income, 1971

<u>Community</u> Type	<u>Average Household Income</u>					
	<u>Qué</u> \$	<u>N.B.</u> \$	<u>P.E.I.</u> \$	<u>N.S.</u> \$	<u>Nfld.</u> \$	<u>Canada</u> \$
All Types	9,068	7,583	6,970	7,927	7,220	9,368
Some Fishing Employment	6,967	6,658	6,298	7,090	5,612	-
Fishing as 1st or 2nd Employer	6,194	5,972	5,450	6,364	4,901	-

^{1/}Specialization here is measured by the Herfindahl Concentration Index, the root-mean of the proportion of employment in each major industrial category in a community. The index has a maximum value of one, and a value equal to or greater than 0.30 is taken to indicate a high degree of economic dependence on fishing and fish processing. The measure may seriously under-estimate the actual extent of dependence in particular cases, a) because larger communities do not exhibit an index value of 0.30 or higher on account of population size and the correlated size of the service sector and b) because the index measures dependence in terms of direct employment, and as input/output studies demonstrate, much additional employment is generated by fishery-related activities. ^{2/} The communities are those defined by the Census of Canada. In some instances, a community may embrace a relatively large number of more or less discrete settlements. Of the total of 702 communities, 331 are organized communities. ^{3/} This category includes all the hamlets, wharf-sites and other localities identified as being a base of fishing operations. In size, these localities range from isolated coastal points with a score or so residents to metropolitan areas like Halifax/Dartmouth (population 230,000).

Source: Compilation by Analysis & Liaison Branch, DREE.

Government Involvement

Federal and provincial governments have spent a great deal of money trying to solve the problems of the troubled fishing industry. In the Atlantic region, apart from recent "extraordinary" expenditures to keep the industry alive, the normal run of governmental expenditures (including loans) in the last three years has been about \$140 million annually.

<u>Object</u>	<u>Average Yearly Expenditure,</u> <u>Atlantic Region, 1973-75</u>			
	(\$ million)			
	<u>DOE:FMS</u>	<u>All Federal</u>	<u>Provincial</u>	<u>Total</u>
Resource Management (conservation, protection, research, etc.)	49.2	51.8	10.1	61.9
Development (including services, grants, subsidies, shared-cost projects, etc.)	25.1	37.9	10.9	48.8
Sub-Total	<u>74.3</u>	<u>89.7</u>	<u>21.0</u>	<u>110.7</u>
Loans (mainly developmental)	<u>1.6</u>	<u>2.1</u>	<u>27.3</u>	<u>29.4</u>
Grand Total	<u><u>75.9</u></u>	<u><u>91.8</u></u>	<u><u>48.3</u></u>	<u><u>140.1</u></u>

Source: Special Compilation by Fisheries and Marine Service.

As these data suggest, government outlays often far exceed direct revenues to government from the commercial fishery. If account is taken of linkages between the fisheries and other industrial and trade sectors, however, the results may be different. The impact of activity in the fisheries is especially strong in the case of transportation and distribution and is not insignificant in that of energy and housing services, for example. Input/output analysis of the economy of the Atlantic provinces indicates that for every \$100 of production, either in primary fishing or in fish processing, government

acquires a net revenue (direct and "induced" revenues combined) of approximately \$25. This is shared among federal, provincial and municipal governments roughly in proportions of 40 per cent, 40 per cent and 20 per cent, respectively. The analysis pertains to 1965, to be sure, when the ratio of public expenditures to fishery production was lower than at present.

The federal government is committed to financial support of the fisheries because, among other things, it carries the jurisdictional responsibility for conserving fishery resources, which are the common property of the nation, and for allocating the distribution of these resources among competing users. Since the establishment of private-property rights in fishery resources is impracticable in the great majority of cases, the state's responsibility for resource conservation and allocation cannot be delegated.

All levels of government are committed to developing the fishing industry and trade, along with other sectors of the economy, and to ensuring the prosperity and security of the people who find their livelihood in the fisheries.

The government tends to be drawn more deeply into the developmental role because of two main factors:

- a) The importance of the industry to regions lacking industrial strength and diversification
- b) The heritage in some regions of an extreme dependence on "one-crop" fishery production, frequently combined with culturally-rooted immobility, a lack of social amenities (for example of medical and other basic services) and a paternalistic milieu.

In these circumstances, remedial action of an urgent nature may be confused with real fishery development. As a result, the effects of short-term programs sometimes conflict with long-term policy objectives. It has happened, for instance, that government has helped to fund additional fish-

processing facilities (as a contribution to industrial development) and imposed catch restrictions (for conservation purposes) in the same place at the same time.

It is likely that, in certain respects, past initiatives by government in the field of development have undermined the motivation of private agencies, firms and individuals to assume responsibility for their own affairs. This may have been a factor, for example, in the failure of the producers' co-operative movement in many places.

THE TROUBLED ATLANTIC GROUND FISHERIES

Beginning in 1974 and continuing to the present, a series of acute emergencies shook the fishing industry in Canada. The federal government responded with financial-aid programs totalling to date about \$130 million. Most of this money was used to prevent collapse of the groundfish industry which, although of secondary importance on the Pacific coast, is the major employer in the Atlantic coast fisheries. This industry has considerable prospects for growth. Close as it is to huge natural resources and to important markets, it should be able to look forward to a bright future at such time as Canada achieves expanded offshore jurisdiction and has rebuilt badly depleted groundfish stocks. At present, however, it exemplifies the common imperfections of the fish business in Canada.

The Primary Sector

The Atlantic groundfish industry employs over 20,000 fishermen (about 55 per cent of all fishermen in the region) and 12,000 plant workers. The groundfish fleet can be divided into three main classes:

- i) About 160 licensed trawlers (large draggers) above 100 feet overall length and capable of fairly long-range operation,
- ii) roughly 500 vessels of intermediate size and varying operating range, such as small draggers, long-liners and large gillnetters, and
- iii) 10,000 to 15,000 small vessels, including line-fishing craft, trap-tenders, and gillnetters. These generally work within a day's voyage of home port and many also engage in two or more fisheries.

Participation of Fishermen
in Major Commercial Fisheries of the Atlantic Coast, 1973

<u>Fishery</u>	<u>Que.</u>	<u>N.B.</u>	<u>P.E.I.</u>	<u>N.S.</u>	<u>Nfld.</u>	<u>Region</u>
	no.	no.	no.	no.	no.	no.
Groundfish	3,800	1,300	800	5,300	10,400 ^{2/}	21,600 ^{2/}
Lobster	1,600	3,100	2,700	7,700	5,300	20,400
Herring	1,500	2,100	600	2,400	5,500	12,100
Total ^{1/}	5,500	5,000	2,600	10,600	15,300	39,000

^{1/} Total number of fishermen engaged, not total of columns. Excepting the offshore fleets, specialization in one fishery is not the norm in the region.

^{2/} Estimated.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974

The groundfish fleet accounts for about 70 per cent of the value of the entire Atlantic fleet of fishing vessels. Its operations are conducted from Cape Cod in the south to Hamilton Inlet in the north. Although intermediate-sized vessels range as far offshore as Georges Bank, the large-vessel fleet dominates operations on most offshore grounds.

The small-boat fleet still takes more than half the codfish catch but their share of the total groundfish catch has declined steadily in recent years. About 70 per cent of the groundfish catch is now taken by the longer-range fleets of intermediate and large fishing craft. The largest vessels are owned by some 12 companies, representing a vertical integration of fishing, processing and, in varying degrees, marketing operations. This integration of operations has been brought about by:

- a) the need to secure a stable, year-around supply of raw material (supply by small boats tend to be seasonal and deficient in variety of species);
- b) the high cost of construction putting large vessels beyond the reach of most skipper/owners. Processing companies frequently help independent owners to buy boats and gear. These boats then become, to some extent, part of an integrated operation.

An integrated company getting most of its fish from its own fleet is likely to be more concerned with the total landed cost of fish than with the price paid for fish in the port market. The latter price, which usually is set by the leadership of the integrated firms themselves, assumes for them the character of an internal transfer price. The evidence suggests, however, that variations in market conditions for finished products are transmitted back to the fishermen's level with some time-lag but without undue distortion. However, port market prices in Canada are low compared with prices in European ports.

There is some evidence that, at current fish stock densities, vessels of intermediate size catch and land groundfish at lower unit cost than do larger craft. The evidence is far from conclusive, however, the issue being clouded by uneven representativeness (of the enterprises sampled), variation in species mix, differing share-systems of remuneration, and other factors.

Comparative costs for the various national fleets operating in the northwest Atlantic are not available but, in terms of average output per vessel/ton/year, the Canadian fleet of offshore and near-shore vessels appears to be the most efficient. Its performance in this respect, while it has declined substantially, is reported still to be almost twice as good as the average for all the fleets in the areas under management by the International Commission for the Northwest Atlantic Fisheries. Sources of excessive costs elsewhere in the industry offset this apparently dominant advantage.

The Processing Sector

Vessels based at some 2,000 locations along the Atlantic coast deliver groundfish to over 1,000 landing points. The landings are destined for more than 300 fish plants. Many of these plants are only collection stations or "feeder" plants which partly process the fish for delivery to larger plants. The vast majority of the plants supply a minimal range of products: basically frozen groundfish. Owned and operated by approximately 120 private companies and divisions of companies (including producer's co-operatives), the plants have a total rated annual capacity for product output of about 340,000 metric tons (product weight). About half of this capacity is now being put to use.

Plants belonging to the 12 vertically integrated companies (excluding

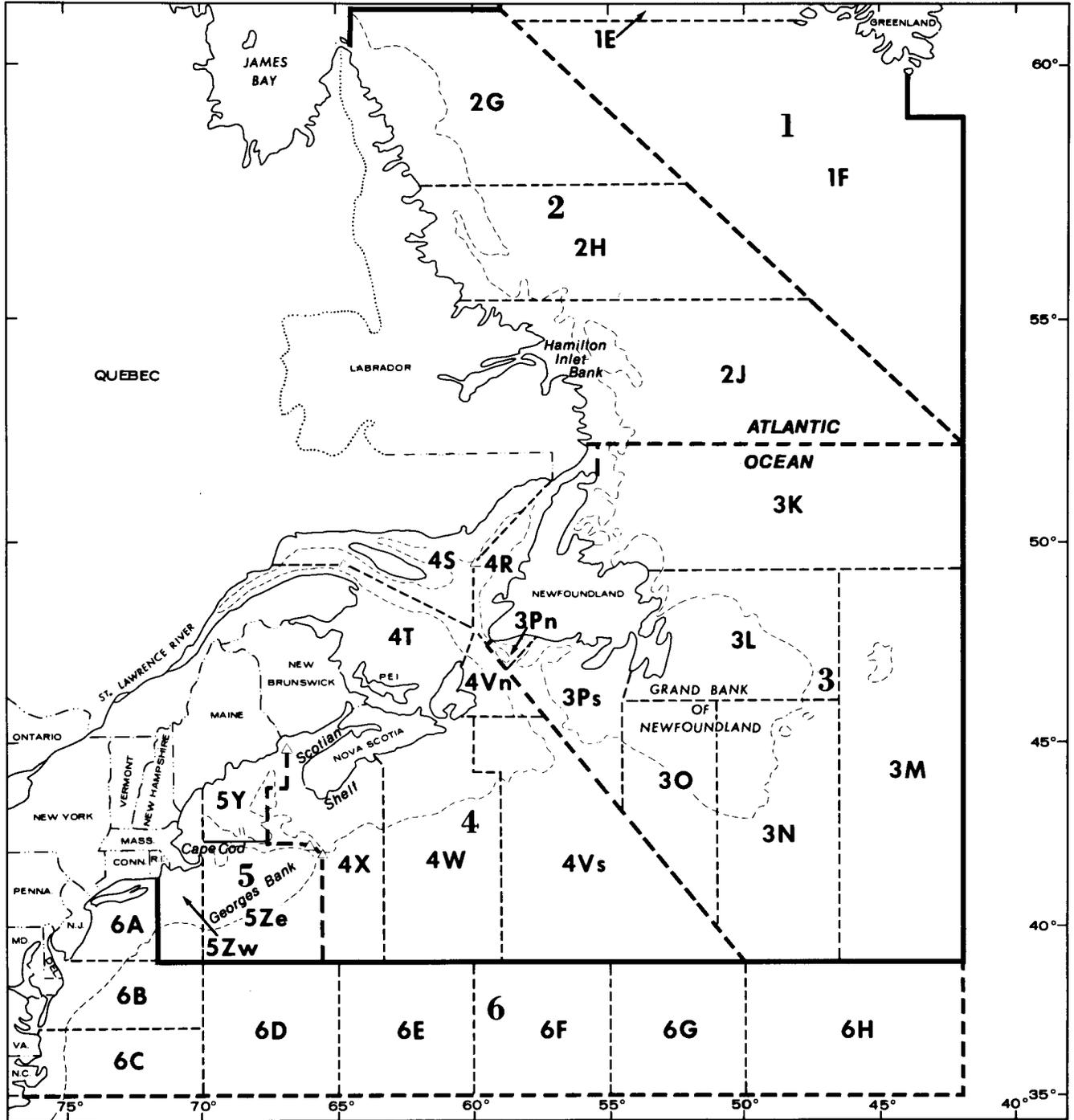
producer's co-operatives and crown corporations) number 50, more or less, 25 of which are served mainly by the large-vessel fleet. These companies account for 80 per cent of the output of fresh and frozen groundfish production (including cured fish and by-products) and 45 per cent of the total fishery production of the region.

At least half the plants operated by the integrated firms and virtually all plants in the non-integrated group are comparatively small in scale. Many are also subject to restricted periods of operation: in some areas the operating season is under five months. This is reflected in the capacity-utilization ratio, which averages about 45 per cent for the smaller plants in contrast with 65 per cent for the larger ones. As a result, there is evidence to suggest, the smaller plants' level of cost (per unit of output) in such cases is typically twice that of larger plants operating the year round.

The Growth of the International Fishery

Until about 1955, only Canada, the U.S.A. and five or six Western European countries fished off Canada's Atlantic coast. Some fleets still used selective fishing gear, i.e. baited trawl, to a considerable extent. Exploitation of the resource was light, productivity per vessel was high and the size of fish available was well suited for processing and marketing requirements.

Anticipating an expansion of fishing in the northwest Atlantic following the 2nd World War, the countries involved established the International Commission for the Northwest Atlantic Fisheries (ICNAF) in 1949. Since then, ICNAF has regulated the groundfish fisheries in international waters from the



INTERNATIONAL COMMISSION
FOR THE
NORTHWEST ATLANTIC FISHERIES

Boundary of the Commission area. ——— Boundary of sub-areas.....
Boundary of divisions..... - - - - - 100 fathom contour.....

west coast of Greenland to south of New England (see map, p. 28).

Until 1970, regulation was restricted to gear control (the setting of mesh sizes and the like). In recent years ICNAF has established closed areas and seasons and has set "total allowable catches" (TAC's) and allocated shares (quotas) to member nations based mainly on their catch levels in recent years, with special recognition of the needs of coastal states. The members of ICNAF, now increased in number to 18, represent every fleet of any importance in the area.

Fishing intensified continuously from the late 1950's onward. Total tonnage of the fleets (excluding inshore craft) rose from 500,000 to 1,700,000. The groundfish catch more than doubled, from 1,260,000 metric tons in 1951 to a peak of 2,829,000 tons in 1965. Although it had dropped back to 1,743,000 tons by 1974 and declined further in 1975, there was no comparable reduction of fishing effort.

The Canadian catch of groundfish rose from about 468,000 metric tons in 1951 to a peak of 638,000 tons in 1968. It has declined steadily since then and in 1974, at 418,000 tons, was 11 per cent less than in 1951. Canada's share of the annual groundfish catch dropped during this period from well over one third to somewhat less than one quarter. Canada's share of the catch of all species caught in the northwest Atlantic is now approximately 20 per cent, ranking third (after the U.S.A. and the U.S.S.R.) among the nations exploiting the fishery resources of the area.

A ranking of the participating countries on the basis of their relative position in production throughout the area can be misleading. Except for the important scallop fishery and minor groundfish and herring fisheries

Distribution of Nominal Catches in the Northwest Atlantic (ICNAF Statistical Area),By Participating Country1973Nominal Catch, All Species

<u>Country</u>	<u>Quantity</u>	<u>Share</u>
	'000 metric tons	%
U.S.S.R.	1,357	30.5
U.S.A.	1,074	24.1
Canada	885	19.9
Poland	255	5.7
German Democratic Republic	185	4.2
Spain	181	4.1
Portugal	135	3.0
Federal Republic of Germany	95	2.1
Denmark	71	1.6
Norway	71	1.6
France	42	0.9
Japan	41	0.9
Bulgaria	37	0.8
Romania	11	0.3
United Kingdom	8	0.2
Italy	4	0.1
Iceland	∅	∅
Others	∅	∅
Total	4,452	100.0

Source: International Commission for the Northwest Atlantic Fisheries,
Statistical Bulletin, Vol. 23, 1975

Distribution of Nominal Catches^{1/} in the Northwest Atlantic (ICNAF Statistical Area),
by Species Group and Sub-Area^{2/}, 1973

(expressed in 1000's of metric tons and percentages)

Species Group		One	Two	Three	Sub-Areas			Total
					Four	Five	Six	
All Species -								
All Countries	t	104.5	158.7	996.0	1,139.1	1,062.8	988.2	4,452.5
Canada	t	-	6.4	227.1	599.4	52.1	0.1	885.1
	%	-	4.0	22.8	52.6	4.9	∅	19.9
Finfish -								
All Countries	t	91.9	158.7	991.7	1,092.8	941.9	492.2	3,772.4
Canada	t	-	6.4	223.0	562.4	16.8	0.1	808.5
	%	-	4.0	22.5	51.5	1.8	∅	21.4
Groundfish ^{3/-}								
All Countries	t	85.8	96.1	755.2	787.4	312.9	55.7	2,096.3
Canada	t	-	4.8	195.8	333.0	7.6	-	541.2
	%	-	5.0	25.9	42.3	2.4	-	25.8
Pelagic Fish ^{3/}								
All Countries	t	0.1	0.8	19.7	269.2	578.2	396.4	1,264.4
Canada	t	-	0.8	19.5	217.7	9.3	0.1	247.3
	%	-	100.0	99.0	80.9	1.6	∅	19.6
Other Finfish								
All Countries	t	6.0	61.7	216.8	36.2	50.8	40.1	411.7
Canada	t	-	0.8	7.5	11.7	-	-	20.0
	%	-	1.3	3.5	32.3	-	-	4.9
Shellfish, etc.								
All Countries	t	12.6	-	4.2	46.3	120.9	496.0	680.1
Canada	t	-	-	4.2	37.0	35.3	-	76.6
	%	-	-	100.0	80.0	29.2	-	11.3

1/ Landings converted to "round" weight. Occasional inconsistencies are due to rounding. A dash (-) = no catch; the symbol ∅ = less than 0.1 per cent.

2/ Sub-Areas are, respectively, 1) West Greenland, 2) Labrador Coast, 3) the Grand Bank and Flemish Cap, 4) the Gulf of St. Lawrence and Scotian Shelf, 5) George's Bank and 6) the Middle Atlantic Coast.

3/ Groundfish (demersal species) and pelagic fish are the major sub-categories of finfish.

Source: International Commission for the Northwest Atlantic Fisheries,
Statistical Bulletin, Vol. 23, 1975

on Georges Bank in ICNAF Sub-Area 5, the operations of the Canadian fleets are concentrated in ICNAF Sub-Areas 3 and 4, i.e. the waters south and east of Newfoundland (including the Grand Bank) and the Gulf of St. Lawrence and Scotian Shelf. Sub-Area 2, off the Labrador coast, is comparatively neglected (except by small boats operating inshore) and only experimental voyages have been made to Sub-Area 1, the grounds west of Greenland.

The Canadian fleets predominate in the fisheries of Sub-Area 3 and 4, taking from 80 to 100 per cent of the catch of pelagic species (chiefly herring) and "shellfish" (crustaceans and molluscs) in these sub-areas. Their share of the groundfish catch is less impressive, however, ranging from 25 per cent in Sub-Area 3 to 40-45 per cent in Sub-Area 4. In Sub-Area 3, the summer run of codfish inshore has been drastically reduced as a result of heavy exploitation of the same stocks offshore by foreign fishing fleets. The Canadian fleet of large vessels has not attempted to replace the shortfall by fishing for cod on the off-shore grounds. A large foreign catch of hake in Sub-Area 3 accounts for the relatively low percentage of landings by the domestic groundfishing fleets in that Sub-Area.

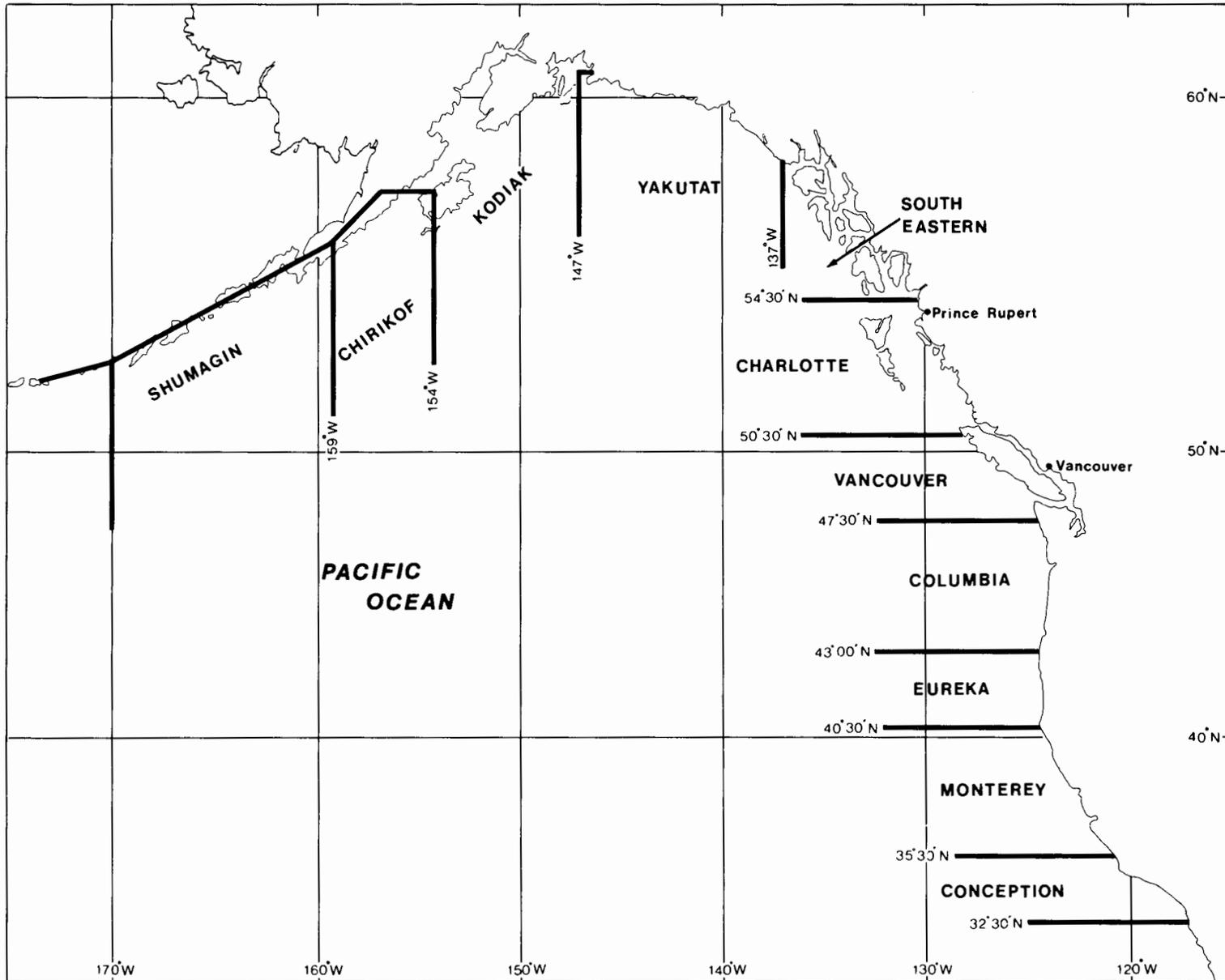
Although it is not possible to attach realistic prices to the catches taken by each of the international fleets, the relative position of Canada in these fisheries would be improved appreciably if production were measured in terms of value rather than physical quantity. The Canadian (and U.S.) catches include highly-valued species such as haddock, lobster and scallop which are absent from those of the European fleets, except as by-catches. Moreover, some of the species, such as silver hakes, argentine and capelin, that make up a significant proportion of the catch of some foreign fleets are at present virtually worthless in the port markets of this country.

PROBLEMS OF THE PACIFIC FISHERIES

Except for halibut, the Pacific groundfish fishery is new and effort in it has tended to fluctuate inversely with the success or failure of the salmon fishery of the region. Nevertheless, some important stocks (the cods and small flatfishes) are already fully utilized. Another major resource - rockfishes - is exploited by the fleets of other countries but the Canadian fleet is not equipped to fish these stocks on a large scale.

Canada and the U.S. have worked together since the 1920's to manage halibut stocks. Under this regime, the total catch, and Canada's share of the catch, gradually increased. However, since the mid-1960's evidence of resource depletion has accumulated rapidly. In 1974 the Canadian catch was about one-fifth of what it had been ten years before. The decline is probably due to intensified fishing for other groundfish species in the northeast Pacific, first by Japan and the U.S.S.R. and more recently by other Asian and East European countries. Large quantities of halibut, often immature, are taken by these fleets in the course of fishing for other species.

The history of the Pacific herring fishery has been different. This is almost exclusively a Canadian fishery and its fortunes have been in the hands of the domestic fishing industry and national resource management. The annual catch approached 250,000 metric tons in the early 1960's, dropped after that and collapsed in 1967. This course of events was to be repeated in part a few years later in the herring fishery of the Atlantic coast. After being closed for three years, the Pacific fishery was reopened and the annual catch, now limited under a strict quota, is steadily improving.



Statistical divisions of the International North Pacific Fisheries Commission

Distribution of Nominal Catches in the Northeast Pacific^{1/} (INPFC Area), 1972

<u>Country</u>	<u>Nominal Catch</u>			
	<u>Groundfish</u>		<u>Salmon</u>	
	<u>Quantity</u> '000 metric tons	<u>Share^{2/}</u> %	<u>Quantity</u> '000 metric tons	<u>Share^{2/}</u> %
Japan	136	33.3	114	38.8
U.S.S.R.	172	42.0	-	-
U.S.A.	67	16.4	103	35.0
Canada	34	8.3	77	26.2
Others	n.a.	n.a.	n.a.	n.a.

1/ Excluding southeastern Bering Sea

2/ Of recorded catch.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

The most important fishery on the Pacific coast is that of the salmons. This fishery too is vulnerable to uncontrolled international fishing. Many important salmon stocks range far to sea, beyond the projected 200-mile coastal zone. These stocks can be intercepted by foreign fleets on the high seas and during their homeward migration. From a conservation and production point of view, however, it is best to take salmon as close as possible to their native streams. Exploitation of Fraser River stocks of sockeye and pink salmon is controlled through a long-standing Canada-U.S. treaty. Over the past 20 years under the International North Pacific Fisheries Convention (signatories are Canada, Japan, and the U.S.A.) high seas fishing for salmon by Japan east of 175° W, and by Canada in the Bering Sea has been prohibited. The Commission established by the Convention does not represent all nations which exploit salmon fisheries of the area, but other participants' activity is conducted under the terms of bilateral treaties. The International North Pacific Fisheries Convention has provided substantial protection for Canadian salmon from exploitation by Japan.

Anadromous and freshwater fish face an equally serious threat in their waters of origin. Whole races of such species may be decimated or destroyed as a result of damage to, or pre-emption of the lakes and coastal river systems that make up their habitat. Already large parts of this habitat have been lost to competing uses such as energy generation, irrigation, navigation, waste disposal and other activities. This pressure, building steadily, vividly

demonstrates the need for not just international but national coordination of the management of natural resources.

THE CAUSES OF DISTRESS

"The Tragedy of the Commons"

The health of the fisheries cannot be defined simply in terms of how much fish is caught. The Atlantic groundfish industry, for example, has had poor years when the catch was good and profitable years when it was comparatively low. As already mentioned, 1973 was a very bad year in terms of catch; yet, in terms of gross value of output and net returns it was the most successful year in the industry's history. Keeping in mind exceptions in some areas, the industry has never enjoyed prosperity for long. Since the Second World War, price declines have pushed parts of it to the brink of collapse every six or seven years. Nor can foreign fishing be blamed for all of the industry's troubles. The imposition of elaborate regulatory measures has been shown to be necessary to prevent depletion of fishery resources by the Canadian industry itself. The Pacific salmon and Atlantic lobster fisheries are cases in point. The fishing industry suffers from a host of difficulties which bear no direct relation to the presence of foreign fleets on the fishing grounds off the coast.

The central problem of the groundfisheries, as of other commercial fisheries, is rooted in a conflict between individual interests and the collective interests. Although wise use of fishery resources obviously concerns the entire fishing industry, fishing enterprises separately must pursue their own interest: that of maximizing their catch. In an open-access, free-for-all fishery, competing fishermen try to catch all the fish available to them, regardless of the consequences. Unless they are checked, the usual consequence is a collapse of the fishery: that is, resource extinction in the commercial sense, repeating in a fishery context "the tragedy of the commons".

The abnormally high profits and earnings characteristic of a young fishery constitute a powerful incentive for the building of more fishing craft and processing facilities. In such a situation the industry over-expands, catch per vessel declines, production costs rise, supply becomes unstable and profit margins shrink or disappear. Many enterprises fail and those that survive do so as cripples in a debilitated industry. The end result is severe economic and social distress for the communities involved. A recent example of this familiar pattern of events can be found in the Gulf of St. Lawrence, where a great proliferation of processing and feeder plants for groundfish, herring, and crab, with a concurrent fleet expansion, occurred during the late 1960's and early 1970's. Indeed, the industry in most regions of Canada shows the chronic weaknesses associated with open access.

Over-Capacity

The fishing industry generally, particularly the inshore part, suffers from over-capacity, i.e. too many vessels and fishermen in relation to the available fish. Moreover, a significant amount of this capacity is wrongly located and unadapted to diverse use. The industry's over-capacity is the result of competition among fleet owners and fish buyers for a dwindling supply of groundfish and other species; competition conducted in a setting of generous public assistance (loans and subsidies) for vessel and plant construction.

Over-capacity in the fleets and congestion on the fishing grounds has intensified "gear conflicts" at two levels:

- between fishermen using stationary gear and those that fish from mobile craft;
- between fleets restricted to local waters and those more highly mobile (usually made up of larger vessels).

Although little known to the general public, these conflicts probably cause more stress than any other problem of fishery administration. In fact they are a smaller, home-grown version of the conflicts between distant water and coastal fleets in the international fisheries. In both cases what seems needed is a system of allocation by a body governing access to the resource.

Over-capacity in processing plants and distortions in the pattern of location have increased in recent years. Established processors have been induced to build additional plants and some "feeder" stations have been able to come into the market as direct suppliers. This has happened largely because of -

- a) buoyant demand for fishery products in the 1970's
- b) a desire to pre-empt rivals in the competition for raw-fish supply,
and
- c) federal and provincial incentives for promotion of economic development.

Failings in the Market Place

In the market place, the Canadian industry has shown these characteristic shortcomings: excessive dependence on a single market, fragmented marketing effort, and inconsistent quality of products.

Sixty per cent of all Canadian fish exports, and nearly all groundfish exports go to the United States. Particularly in export markets, depending on a single outlet is risky practice, increasing the vulnerability of the industry to economic fluctuations. For example, starting in 1973 the price of certain meat products such as hamburger and poultry dropped in the U.S. market. The decline was accompanied by an increase in the supply of low-priced competitive fish products from other nations exporting to the U.S. A slump in prices followed, one cause of the problems Canadian groundfish exporters face today.

Besides competition from other suppliers, an uncontrolled rise in the price of Canadian fishery products relative to meat and poultry in the early 1970's (as in previous periods of market expansion), and a decline in domestic production may have contributed to the relative decline in Canada's share of this market. Between 1969 and 1974, Canada's sales of groundfish blocks dropped to 12 per cent from 33 per cent of the total market. In the case of fillets the descent to 48 per cent from 74 per cent.

Other countries have been steadily building their share of the U.S. groundfish market. Most do not suffer from the lack of coordination found in the Canadian industry, but have strongly centralized industries with consolidated marketing organizations.

Lack of coordinated effort among Canadian exporters frequently makes a bad marketing situation worse. A recent example is that of some 30 crab-meat producers on the Atlantic coast, some with shortages, some with surpluses, all of them marketing individually, competing for a narrow two per cent sliver of the American market; doing so moreover without any system of exchange or communication with each other. For many the result, by 1975, was imminent bankruptcy, and an appeal for government assistance.

The lack of forward integration to the retail level is a by-product of fragmentation of the industry. For example, there are 80 exporters of groundfish from Canada, only 40 of which are of some size (including the dozen or so vertically integrated major firms). This is a very large number of companies, as compared with Scandinavian and other countries competing with Canada in the U.S. market. Although the Canadian export trade is dominated by a relatively small number of the larger firms, market developmental and promotional efforts have been sporadic and diffuse.

The Quality Issue

Competition for an increasingly scarce supply of fish has been followed by deterioration of product quality, and consequent market losses. In the large-vessel groundfish fleet, for example, trips grew longer and fish size smaller. In the inshore fishery, buyers were more willing to accept improperly handled fish, often degraded further while being transported elsewhere to be processed. The end result is a situation in which groundfish landings with an estimated potential value of \$25 million are rejected outright as unfit for human consumption each year, and a further substantial loss sustained in the production of a lower quality product than could be obtained with proper methods. An additional loss, occasionally on a serious scale, is sustained from discards of undersized fish and of unwanted species taken while fishing for the sought-after groundfish species.

Variation in the quality of Canadian fish products has reduced their acceptability on the market. In some cases, foreign competitors get a higher price for the same basic product, because of a perceived difference in quality.

The Canadian fishing industry has taken no consistent position on this matter of product quality. This is partly because some traders have found it possible to dispose of products of less than prime quality and, if necessary, to evade consequent losses through manipulation of prices to fishermen.

An indifference to quality on the part of fishermen has been fostered by the knowledge that port markets seldom pay more for better quality. Generally speaking, there is no official inspection of the catch at dockside. Even properly handled fish leaving the vessel and the processing plant in first-class condition may deteriorate when stored for a long time at the wrong temperature. This is a particular problem at the retail level, where in almost every case the Canadian producer has no control.

Instability

The fishing industry along with many others suffers from unstable product prices and unstable material and service costs. The fisheries are also buffeted by forces of a special kind arising from the character of the resource base.

The movement of fish stocks, the appearance (time and place) of runs inshore and of concentrations on the offshore grounds, is controlled by such factors as water temperatures and food supply. The influence of these factors changes as stock density and inter-stock balance change: the degree of variation in resource availability, that is, tends to increase with intensive exploitation.

There is a seasonal pattern in some of these variations, which the industry may accommodate within the fishing year by effective fleet deployment and by the use of appropriate technology. The development of a highly mobile fleet operating from strategically placed bases in the Pacific salmon fishery is an example. Year-to-year variability is much more difficult to deal with particularly when (as is commonly the case) the variations cannot be accurately predicted. Over the past 20 years, for example, the annual catch of Atlantic cod in Canada has fluctuated (on a downward trend) between 20 per cent above and 20 per cent below that of the previous year - the average variation being about ten per cent. For the Pacific salmon fishery, the variations are even greater (if more predictable), namely 90 per cent above the previous year and 55 per cent below, with an average variation of 35 per cent.

Resource-based fluctuations of this magnitude from time to time may be superimposed on the movement in costs and prices stemming from the other sources mentioned. The result can be a steep, and usually unforeseen, fall or rise in earnings and profits. Industry reaction to this form of uncertainty frequently

has been to install sufficient catching and processing capacity to handle the peaks in supply, thereby inflating industrial overheads and reinforcing the inherent tendency toward over-expansion in the commercial fisheries.

NEW DIRECTIONS IN FISHERY MANAGEMENT AND DEVELOPMENT

The Need for Change

By mid-1974 the groundfish industry's appearance of health had vanished abruptly as the cost of gear, fuel and labour shot skyward. In that year it cost the large-vessel fleet ten to twelve cents per pound to catch fish, compared with five to six cents in the late 1960's. In the United States market, which takes over 90 per cent of Canadian groundfish exports, problems developed as the price to consumers of certain meat products went down. Retailers maintained high markups on fish products and, as a result, fish sales slackened and inventories rose. In this situation, suppliers of lower-cost competitive fish products, Japan and Korea in particular, acquired a decided advantage.

These developments, combined with structural weaknesses, threw the groundfish industry into deep crisis, and its leaders appealed to government for assistance to survive. On July 17, 1974 the federal Cabinet authorized the Minister of Fisheries to provide working-capital loans and assistance for inventory financing and product promotion, at an estimated cost of \$10 million. The program covered all frozen groundfish products as well as canned and frozen lobster and crab meat. In November 1974, Cabinet authorized the Minister of State for Fisheries to extend the program until the end of the following March at a cost of \$4.5 million. Two months earlier the Minister had announced that the government would purchase \$1.5 million worth of canned ocean perch (redfish) to reduce inventories, and also as a contribution to international food aid.

In December, 1974, the Cabinet authorized three more measures of assistance for the industry:

- i) \$14 million for short-term deficiency payments (conditional cash grants) on frozen groundfish production for the period January 1 - April 30, 1975.
- ii) \$3 million to salvage frozen groundfish inventories by canning. These supplies were earmarked for international food-aid programs.
- iii) \$3 million for working capital loans to proprietors of plants affected in early 1974 by ice conditions in eastern and northern Newfoundland and the lower North Shore of Quebec.

Pending long-term measures to reconstruct the industry, the Minister of State for Fisheries announced, in April 1975, an interim program funded to March 31, 1976 at \$51 million. This "bridging" program which applied throughout Canada comprised the following elements:

- deficiency payments directly to groundfish fishermen of 2.5 cents per pound for first-quality fish as landed (authorized funding \$27 million);
- conditional grants to processors of first-quality frozen groundfish fillets and fillet blocks (eight cents per pound of finished product) based on maintenance of at least the basic price to fishermen paid on July 1, 1974 (authorized funding \$14 million);
- conditional grants to processors on sales of first-quality fresh groundfish fillets within Canada (funding included in preceding item);
- deficiency payments to crab fishermen (authorized funding \$0.3 million) and to crab processors in the Atlantic region (authorized funding \$0.3 million);

- deficiency payments to primary producers in the freshwater fisheries for mullet production (authorized funding \$0.3 million) and for the production of cutter-grade whitefish (authorized funding \$0.2 million);
- deficiency payments to smelt fishermen (authorized funding \$0.2 million);
- purchase of canned lobster from the 1974 inventory carry-over (authorized funding \$0.2 million);
- purchase of mackerel, herring, gaspereau and groundfish for international food-aid and development programs (authorized funding \$3.5 million);
- cold storage and inventory-financing assistance for lobster and crab (authorized funding \$1.5 million);
- assistance to Newfoundland fishermen affected by abnormal ice conditions in 1975 (authorized funding \$0.6 million).

In March, 1976, the Minister of State for Fisheries announced that temporary assistance would continue in fiscal year 1976-77, under a program with authorized funding of \$44 million.

The total aid authorized would, if used entirely, work out to approximately \$6,500 per fishing enterprise or over \$2,200 for every fisherman in Canada. Many fishermen, however, received no part of this aid: by far the greater part of it was concentrated in certain segments of the Atlantic fisheries.

The crisis of the present, the chronic problems of the past, the expectation of national jurisdiction over offshore fishery resources in the future, the evidence of a potential for development of a viable fishing industry

and the deepening financial involvement of government, all combined to bring matters to a head. The Minister of State for Fisheries, late in 1974, inaugurated a comprehensive study into the whole field of fishery management and development in Canada, with particular reference to revitalization of the groundfisheries of the Atlantic region. The issue of salmon resource enhancement opportunities in the Pacific region was being studied separately.

Over its course, the study drew upon the resources of several government departments. Extensive consultations were held with provincial governments, processors and fishermen. The study found general agreement on the nature of the commercial fisheries' problems, such as over-capacity and fragmentation in the groundfish industry and on the need for a new approach to their solution: an approach that would strengthen the industry economically, benefit society generally, and involve fishermen and other interested parties in policy-planning and implementation processes.

Inadequacy of Traditional Approaches

Where an industry is based on a resource that belongs to all, the danger of over-expansion is always present. Only rarely do market forces prevent this. More often, competitors in an unchecked scramble for advantage force each other to the verge of collapse. Stability, with equitable access to a reliable resource, normally is maintained or restored only through the imposition of controls by government.

Traditional fishery policy in Canada, as in many other countries, has tended to be simplistic in the approach to resource management and relatively non-interventionist and uncoordinated in regard to industrial and trade development.

Resource-management strategies have been directed mainly toward:

- 1) regulation through international cooperation of foreign exploitation of the fishery resources of concern to Canada;
- 2) management of resource use on a discrete stock basis, with the research backup and enforcement service required for these purposes;
- 3) harvesting resources up to the biological "maximum sustainable yield" (MSY) level.

In the application of MSY, an assessment based on scientific information is made of the maximum yield in weight or numbers of fish available annually from separately identified stocks of a fish species. On the basis principally of that assessment, a total allowable catch (TAC) per year from each stock is established.

A major defect of this approach is that it does not pay enough attention to the equilibrium of the whole aquatic system, including the interaction (competitive and predator-prey relationships) between species. The "by-catch" issue is an aspect of this. Stock assessments are dependent on accurate catch statistics, but large quantities of fish from stocks under quota are caught incidentally in the course of fishing for other species, are discarded at sea, and usually go unrecorded.

A second defect is that the MSY approach, in association with free entry, tends to attract input of investment and employment in excess of the economically or socially optimal level.

The concepts of MSY and "full utilization" of fishery resources, with their implied promise of relief from food shortages, have a powerful appeal in the world community. In fact, they are entrenched in most international fishery-management conventions. They are inapplicable to the management of fishery

resources on an ecosystem basis, however, and, the evidence indicates their pursuit is ruinous for the industries and people involved. A recent agreement among the membership of ICNAF to a 40 per cent reduction in fishing effort (measured by vessel-days expended) suggests a dawning of this truth in some quarters at least.

In industrial and social development also, policy has skirted some basic problems. The strategies implicit in existing federal programs may be stated as follows:

- 1) Provision of research services in support of industrial development in the primary and secondary sectors of the fisheries.
- 2) Provision of technical and financial assistance (loans and subsidies) for fleet modernization and expansion.
- 3) Provision of a quality-control service through plant and product inspection.
- 4) Provision of funds for expansion, modernization, and diversification of processing.
- 5) Provision of informational and certain other marketing service.
- 6) Provision of certain price stabilization, equipment insurance and (under Unemployment Insurance Commission administration) income support services.
- 7) More rarely, direct intervention (in collaboration with the provinces) in segments of the fishing industry and the fish trade: The Freshwater Fish Marketing Corporation in the Northwest Territories, the prairie provinces and northwestern Ontario, and the Canadian Saltfish Corporation in Newfoundland and parts of Quebec, exclusively control the marketing of certain products from those areas.

For the commercial fisheries generally, including the groundfisheries, these strategies have been deficient in several respects. Major problems have persisted, culminating in the present crisis. The current troubles of the industry, nevertheless, coincide with a clear opportunity for the future development of a highly productive fishery economy.

Basis of Policy Formation

The analysis of the fisheries carried out in 1974-75 by the Fisheries and Marine Service showed that, in some respects at least, fundamental restructuring of the fishing industry is inevitable. It will come about either in an orderly fashion under government auspices or through the operation of inexorable economic and social forces.

In the conviction that coordinated action at all levels of the fishing industry and fish trade can create a stable, prosperous sector of the economy, regionally and nationally, the federal government proposes to intervene to ensure that fisheries development is managed in the best interests of Canadian society. The strategies to be adopted incorporate two major shifts in policy:

- 1) The guiding principle in fishery management no longer would be maximization of the crop sustainable over time but the best use of society's resources. "Best use" is defined by the sum of net social benefits (personal income, occupational opportunity, consumer satisfaction and so on) derived from the fisheries and the industries linked to them.
- 2) While private enterprise, individual, cooperative and corporate, would continue to predominate in the commercial fisheries, funda-

mental decisions about resource management and about industry and trade development would be reached jointly by industry and government.

The fishery economy of the future would be a vigorous and stable one, in which the reward for a given amount of effort or investment would be in line with rewards in other industries. The fishing industry would be productive enough to share the financial burden of resource maintenance and other services provided by the state to the users of fishery resources. The fish trade would be fully competitive in international markets.

Some branches of the fisheries would become more capital-intensive than at present in order, for example, to take advantage of certain distant-water fishing opportunities. Operations would be centred at ports where the goods and services required by a progressive, innovative industry could be provided, as far as possible, from local resources. While there need not be a shipyard in every community and while, in most cases, engines, winches and electronic equipment might be brought from outside, a wide range of gear and equipment would be fabricated locally. Similarly, services such as technical training, equipment repair and servicing and the supply of chandlery and provisions should be largely localized. Coastal areas thus would be revitalized and industrial progress would be combined with the advancement of regional cultures and life-styles.

For this approach to succeed, many groups must work together. Success will require coordination of planning and programming not only among federal agencies but with other levels of government as well. It is essential that the people of the communities involved, understand their stake in and responsibility for rehabilitation of the fisheries.

There are several statutes administered by the Minister of State for Fisheries upon which fishery management and development measures can be based:

The Fisheries Act

The Coastal Fisheries Protection Act

The Territorial Sea and Fishing Zones Act

The Fisheries Research Board Act

The Fisheries Development Act

The Fish Inspection Act

The Fisheries Prices Support Act

The Canadian Salfish Act

The Freshwater Fish Marketing Act

Other federal agencies also administer pertinent legislation, in particular the Department of Regional Economic Expansion (providing incentives for economic development in general), the Department of Manpower and Immigration (providing for unemployment insurance as well as for retraining and relocation) and the Department of Industry, Trade and Commerce (providing for industrial development and export controls).

The Social Impact of Development

The long-term viability of the industry and trade depends on getting rid of certain structural defects - notably catching and processing over-capacity, dispersal of processing facilities, and fragmentation of business organization.

The well-being of fishing communities depends upon these changes being made in a gradual, systematic manner. The government of Canada has stated explicitly, as far back as 1970, its position that while it is desirable to restructure the industry, "rationalization" could only proceed as quickly as

acceptable alternative opportunities were opened up for people affected by these changes. The government is acutely aware that abrupt action to correct all defects across the board would be traumatic - that it could destroy the source of livelihood for large numbers of people and remove the economic base of one-industry communities and districts. Many such communities and districts are found in eastern and northern Newfoundland, around the Gulf of St. Lawrence, in the northern prairie region, and on the central coast of British Columbia.

This basic principle of minimizing disruptive impact of change has therefore been an unchanging tenet of government policy for some years. What has changed since 1970 is a perception of the urgency of the situation: seen in the light of the current crisis, extensive restructuring is not merely desirable but imperative. The prospect of Canada achieving extended offshore jurisdiction does nothing to lessen the urgency of the matter. The problems, as shown earlier, transcend jurisdiction. Even with extended jurisdiction, it will take years to restore fish stocks to a point where Canadian catches may be improved significantly.

In short, fisheries development is synonymous, in this context, with a restructuring of the industry itself for its very survival. Where adverse social side-effects such as reduced employment opportunities can be kept within acceptable limits, restructuring should proceed. Where damage to the community would outweigh advantages in the short run the changes must be postponed.

In the inshore fisheries generally, especially those of the Atlantic region, the labour force far exceeds the industry's capacity for employment at an adequate level of income. This disparity explains the low level of labour productivity in the Atlantic fisheries. A reduction in the number of people employed in the primary fisheries would have different effects in different communities. Three types of situation may be recognized.

- a) Communities with a well differentiated resource-base or which can draw on resources within commuting distance - this situation is found, for example, around major metropolitan centres and in more developed urban communities, especially in British Columbia, Ontario and Nova Scotia.
- b) Single-industry fishing communities where a real potential for resource diversification exists - there are several in British Columbia and in the southwest Maritimes.
- c) Fishing communities with a very limited potential for diversification and development, a number of those located along the shore of the Gulf of St. Lawrence and on the northeast coast of Newfoundland, for example.

The economic problems of the last type of community manifest themselves in such symptoms as underdevelopment of basic services like transportation facilities, housing, and public water and sewage-disposal systems. To be sure, many residents of these communities may have a satisfying life notwithstanding. But there is ample evidence, e.g. the frequent demands for government assistance in one form or another, to indicate that many others are sensitive to their disadvantages.

Even with an extension of coastal-state jurisdiction, problems will **remain** for these communities. Those located on the eastern coast of Newfoundland and on Labrador may be taken as an example. Landings of codfish, principally by small boats fishing close to shore, still account for about 60 per cent of the total value of fishery production in that area, although, as a result of intensive fishing of the stocks offshore and, more recently, because of delays in the annual operating season (due to an ice barrier), the tonnage of cod landed in the area has been reduced to one-fifth of what it was twenty years earlier. This is one of the most dramatic examples of losses to Canadian fishermen caused by expansion of the international fishery.

Allowing for some improvement in technology over this period, it is probable that the local groundfishing fleet is capable of taking up to 200,000 tons of codfish each year. At today's prices that would raise average gross earnings from fishing, for each of the approximately 9,000 fishermen in the area to about \$5,000. This would be a great deal better than the present average of \$1,500 or thereabouts but it hardly represents prosperity for many coastal communities.

It is true that an additional catch, of indeterminate size at present, might be taken on offshore grounds adjacent to this coast. That catch, however, would have to be taken with large, specially-equipped vessels; landings from a fleet of that type are unlikely to benefit more than half a dozen ports in the area.

One requirement for a viable and prosperous commercial fishery is that fewer people be employed in relation to output in primary production. This does not mean drastic dislocation of the people now dependent on the fishing industry. It does mean that where it is feasible to expand, this expansion should be accomplished without increasing employment in the fishery itself. With a viable fishing industry firmly based and growing, new job opportunities in a variety of associated industries and services would develop throughout the region.

Prospects for Development

The word "development" means different things in different contexts. As used here it means the expansion of commercial fisheries production with a resulting generation of monetary and other benefits to the Canadian fishing industry and the community.

There is plenty of room for increase of output in the fishing industry. If one excludes the 12-mile territorial sea, the Gulf of St. Lawrence, and the Bay of Fundy, the Canadian share of the catch in waters adjacent to the Atlantic coast (ICNAF Sub-Areas 2, 3, and 4) was only one-sixth of the total in 1973. Codfish makes up over 50 per cent of the total groundfish catch of all fleets fishing the area. Canada gets less than one-quarter of this catch. When extended jurisdiction comes, and when the stocks have been rebuilt, there is an excellent opportunity for development based on an expansion of the cod fishery.

There may be other opportunities: for instance, in processing catches of species now usually discarded by domestic and foreign fleets, and, if it were proved desirable, in processing landings from foreign fleets that the Canadian fleet is not equipped to take. One benefit of the latter activity would be product diversification for Canada. Since processing operations are more labour-intensive than modern fishing operations, this approach would also make sense in terms of augmenting general employment.

The most significant possibilities for development lie in an increase in the ratio of catch to fishing effort and in the greater age, thus size, of fish that would result from a diminished intensity of fishing effort. Achievement of these aims would depend particularly on reduction of effort by foreign fleets (Canada's fleet of intermediate and large vessels makes up only about seven per cent of total tonnage in the ICNAF area).

If the total fishing effort were cut in half, the initial result would be to reduce the total catch by about the same proportion. Within five to ten years, however, in the example of the cod fishery, the catch could thereby be restored to 75 per cent and possibly 85 per cent of its present level.

At the same time, the catch per unit of effort (CPUE) would have been raised by 50 to 90 per cent. To achieve these results, it is necessary to abandon maximum sustainable yield, as the ruling principle of resource management, and aim instead for an effort-to-catch ratio based on the optimization of benefits to society.

In the case of the Pacific salmon industry the key to development is a public awakening to the threat facing these species from environmental degradation of their freshwater and estuarine habitats and the potential for increasing their numbers. It is possible, using knowledge and technology readily available today, to double the size of the salmon stocks. Given the level of commercial and recreational demands (domestic and export) this would probably represent the best use of most of Canada's major salmon-bearing river systems. As in the case of Atlantic groundfish, however, a necessary first step is the setting up of an effective international management regime and a system that controls access to the resource.

In March, 1975, the Honourable Roméo LeBlanc, Minister of State for Fisheries, announced that the federal government was committed to development of a major program to expand Canada's Pacific salmon resources. In June, 1975, a memorandum of understanding was signed with the province of British Columbia, providing for federal-provincial cooperation in the preparation of coordinated program proposals. The federal government spent \$1.2 million in 1975-76, and plans to spend at least another \$4 million for feasibility studies and planning activities in 1976-77. Detailed plans for the first phase of development projects will be ready for submission to the federal Cabinet for approval by the fall of 1977.

The program is aimed at restoring the salmon species to their historic abundance (when landings were about double their current level), thereby increasing greatly the returns to the commercial fishery, and tripling the capacity of the sports fishery which already supports one million user-days of angling. The program also will ensure adequate resources for the traditional Indian food fishery. Achievement of these goals by applying proven enhancement techniques such as artificial spawning

channels, hatcheries and fishways, could be attained by about 1990. Costs of the program, to be financed mainly by the federal government, tentatively estimated at \$250-300 million, should eventually be recovered in terms of increased returns to the salmon fisheries.

Some of the techniques of resource enhancement (i.e. increase in fish stocks) border on those of aquaculture. Aquacultural development in Canada has been limited by problems of nutrition and disease control and by an inadequate legal and institutional environment for business enterprise in this field. The incentive for such development will come when the cost of fishing natural stocks begin to exceed the comparable costs of aquacultural production.

If Canadian society as a whole is to get the best combination of benefits from development of the fisheries, open access to resource use must be curtailed. If it were not curtailed, the lure of a quick profit and other short-term gains would continue to produce overcrowding in the fisheries; and a proliferation of fleets and processing facilities. This kind of congestion leads eventually to depletion of fish stocks and a waste of social resources. Effective entry control helps to stabilize the resource base and to smooth out the cyclical peaks and valleys on cost/price charts.

Productive fishing enterprises operating in an entry-controlled fishery earn more. There should be a surplus in relation to normal returns for the labour employed, the capital invested, and the business risk taken. The management authority would have three choices for distributing this surplus:

- a) It could let the surplus accrue to the participating enterprises.
- b) It could permit the entry of additional enterprises and thus dissipate the surplus.
- c) It could appropriate the surplus through collection of "royalties", on behalf of the resource owners, i.e. the people of Canada.

Under certain conditions alternative (a) would be justifiable. Entry to the Pacific groundfishery is currently being restricted in order to raise the level of enterprise earnings and so stimulate owners to invest in the equipment they need to compete with foreign fleets. In most cases though, since it could create a class of privileged fishermen, this is an inequitable alternative.

Alternative (b) might be desirable in situations where the need to create employment opportunities is important. However, on conservation and on economic grounds this approach would not usually be acceptable.

Alternative (c), which amounts to receiving rent from an asset owned by the public, is analagous to the recovery of royalties from industries like forestry and mining. It can be justified on the basis that the state provides services to maintain and enhance the fishery resources, and the fact that the resource is an asset owned by all citizens.

The engine of growth for the fisheries is market demand for fish. This demand tends to be "inelastic" as to price, i.e. changes upward or downward in price do not result in proportionate changes in consumption.

Growth of the Canadian groundfish industry has depended on the U.S. market. Per capita consumption of fish in that market has remained stationary for many years, and the consumption of other food products shows a similar constancy. The evidence does not suggest that any great change in these habits can be effected by promotion except for relatively brief periods. The fish trade may have to exert much greater efforts in this direction simply to hold its position relative to competing products. This does not mean that markets cannot be expanded. Expansion can be fueled from two sources:

- a) population growth in areas of traditional sale
- b) the development of more sales outlets elsewhere.

Apart from cured groundfish products, which appear to be in strong demand in world markets, the outlook for market diversification is uncertain. Throughout the northern hemisphere, and in some parts of the southern hemisphere, the yield from the major fishery resources has reached a peak or is declining. This does not necessarily increase Canada's opportunity to sell Canadian fish. Such an increase would depend on the presence of large numbers of people with the inclination and the ability to purchase Canadian fish. The significance of a "hungry world", like that of the "200-mile limit", as a simple answer for the problems of Canada's fisheries, has been greatly exaggerated.

STRATEGIES FOR FISHERY MANAGEMENT AND DEVELOPMENT

To achieve government policy objectives for fishery management and development* not one but many strategies are needed. The following list comprises some already adopted as the basis for design of long term (5 to 10 year) programs. The strategies in part complement, in part supplement, and in part replace those already in existence (see p.52). The list is subject to extension and the separate strategies to more precise statement.

A. Resource Management

1. Obtain national control of the exploitation of fishery resources throughout a zone extending at least 200 nautical miles (370 kilometres) from the Canadian coasts.
2. Secure international recognition of the state of origin's primary interest and responsibility for anadromous fish species.
3. Provide for redevelopment and enhancement of fish stocks whose natural habitat or environment is amenable to effective modification.
4. Institute a co-ordinated research and administrative capability to control fishery-resource use on an ecological basis and in accordance with the best interests (economic and social) of Canadian society.
5. Provide the research and the institutional innovation necessary to foster the development of viable aquacultural enterprise.

* These are elaborated in Appendix I

6. Allocate access to fishery resources in the short-run on the basis of a satisfactory trade-off between economic efficiency and dependency of the fleets involved.
7. Develop a fully effective capability for the monitoring of information on resource and oceanic conditions, for the surveillance of fleet activity and for the enforcement of management regulations.

B. Fishing

1. Apply systems of entry control in all commercial fisheries.
2. Co-ordinate the deployment of mobile fishing fleets, over the fishing grounds and the operating season.
3. Provide for the withdrawal of excessive catching capacity in congested fleet segments and in areas of low productivity, and for the best possible mix of fleet units.
4. Abolish the use of destructive and wasteful fishing gear and fish-handling practices.

C. Fish Processing

1. Facilitate price differentiation according to quality of fish landed.
2. Provide for the allocation of landings (raw-fish supply) in accordance with the most profitable end use.
3. Concentrate programs of technical and financial assistance for the processing sector on the up-grading, relocation and consolidation of existing facilities.

4. Promote the transfer of technology from research and development to practical application (in the interest of product innovation and enhancement of the value added in processing).
5. Determine the desirability and feasibility of a) securing unwanted by-catches from fleets operating within range of coastal ports and b) processing landings from foreign fishing fleets.

D. Product Marketing

1. Promote consolidation of the export-marketing of fishery products and forward integration of the trade, that is, acquisition by exporters of processing facilities and distribution outlets abroad.
2. Encourage inter-firm developmental and promotional programs in domestic and foreign markets.
3. Bring existing market-intelligence, forecasting and trade-development services to full effectiveness and provide such additional and related services as may be required.

E. Fishermen and Their Communities

1. Develop a program or programs to mitigate the effect of the instability inherent in the commercial fisheries on the net revenue of fishing enterprises.
2. Provide, through the adaptation of existing programs and/or the design of alternative programs, for the relief of chronically income-deficient fishermen.

3. Foster the acquisition of professional status by commercial fishermen, for example, by means of suitable programs of training and certification.
4. Institute mechanisms, appropriate to the groups and areas involved, to facilitate individual and community adjustment to economic and social change.
5. Integrate programs for fishery development with those designed for regional economic development in general.
6. Ensure the fullest possible involvement of all the people concerned, that is, fishermen, plant workers, businessmen and members of the interested public, in the decision-making process associated with fishery management and development.

These 25 strategies have been chosen by the federal government as policy guidelines for program design in federal departments, particularly within the Fisheries and Marine Service of DOE. Clearly, many strategies anticipate co-ordination of programming with provincial governments and with private agencies (fishermen's unions and associations, fishing and trading companies, community organizations and so on) as well.

BUDGETARY CONSIDERATIONS

Until precise plans of action have been drawn up, realistic estimates of what it will cost to put them into practice are not possible. It should be kept in mind that many of these strategies involve a redirection rather than an expansion of government activities.

However, it should also be remembered that while it may be possible to cover some increased costs by reallocating funds, this will not be feasible across the board. When Canada acquires extended jurisdiction, the nation will need to be able to manage that greatly increased area of fisheries jurisdiction. This will mean expansion of patrol, surveillance and research activities, an increase involving large capital and operational expenditures. It may be possible to reduce the cost to the public of management programs (and eventually to cover them completely) by collecting substantial entry fees from foreign and domestic fleets.

The need for some government spending should diminish as the programs take hold. In the present depressed state of the industry, publicly-funded programs of income maintenance are likely to continue for some time. However, as the various enterprises in the industry become able to pay their way, a program to stabilize net revenue, for example, could become self-sustaining with payments into a central fund when times were good and withdrawals from this fund when earnings fell below the norm.

Similarly, as entry control and growth in the real value of fishery output mitigate the problem of inadequate earnings for fishermen, the need for special income supplementation would diminish or disappear.

IMPLEMENTATION

In developing the policy described in this paper the Government is responding to a long-standing need to rationalize the management and use of our fishery resources. Fishermen and other representatives of the industry have had a voice in developing this approach. Through service on advisory bodies, attendance at regional and national meetings and informal consultation, they will continue to be involved in the unfolding of policy over the coming years.

The setting of policy guidelines is chiefly the responsibility of a steering committee of senior members of the Fisheries and Marine Service reporting to the Minister of State for Fisheries at Ottawa. Other groups and individual officials in the five regional Fisheries Management divisions of the Service* are responsible for the translation of such guidelines into programs of action. The Service is committed to a detailed review of every program with the people affected.

The problems of the industry and the programs designed to solve them are complex, and they touch the lives of everyone involved in the commercial fisheries. These fisheries contain many frequently contending elements. When it is necessary for government to make decisions involving irreconcilable interests, it will do so on the basis of the principles set forth in the preceding pages.

* Listed on inside back cover

Some programs are already in the process of being designed. The following is a brief, necessarily incomplete list of program areas which are under intensive development at the time of writing:

- Resource Management and Enhancement
- Allocation of Access
- Fleet Development
- Quality Improvement
- Fuller Utilization of Fish Resources
- Improved Use of Pelagic Resources
- Industrial Restructuring
- Export Marketing Consolidation
- Net Revenue Stabilization for Fishing Enterprises
- Income Supplementation
- Canada-Foreign Arrangements

Separately and alone, the programs can do little to solve the problems of the ailing industry. Together - and reinforced by others yet to be designed - they can result in a prosperous and stable industry, capable of rewarding the investment of labour, talent, and capital of the people involved in it.

APPENDIX I

POLICY OBJECTIVES

FOR FISHERY MANAGEMENT AND DEVELOPMENT

In formulating strategies for fishery management and development, the goals of Canadian society identified by such agencies as the Economic Council and the Science Council of Canada provide a starting point.

In operational terms for the fisheries these goals may be restated thus:

1. Maximization of food production from fishery resources to the extent that this is consistent with efficient use of society's other resources.
2. Compatibility of fishery-resource use with enhancement of the harvestable productivity, and preservation of the ecological balance, of the aquatic environment.
3. Allocation of access to fishery resources in accordance with optimal (best) use, and assurance of equity of access and security of tenure for resource users.
4. Growth in the fishery economy in terms of real output per capita.
5. Optimization and optimal distribution of returns to social resources (labour, capital and the natural resource) from the fisheries.
6. Minimization of instability in net returns to resources.
7. Economic viability of (fishing and fish processing and distributing) enterprises in the commercial fisheries.
8. Prior recognition of and adequate provision for the economic and social impact of industrial change.
9. Minimization of individual and community dependence on paternalistic industry and government.
10. Protection of national security and sovereignty.

No priority ordering should be read into this list. The goals interact in some instances. One may further or limit the realization of another. If we are to realize goals embracing environmental harmony, material well-being and cultural opportunity, tradeoffs and compromises are inevitable. If we look back at the fifth goal in this list, for instance, we see that it will involve a trade-off between higher returns to a few and lower returns to the many. The need to retain a minimum employment level in areas chronically afflicted by unemployment or underemployment sets one of the boundaries within which the trade-off must be made.

From the preceding rather general statement of goals, a set of precise objectives has been drawn up, as follows:

Resource Use and Allocation

1. Establishment of an effective management regime for the natural resources.

This is the prerequisite to everything else. To the extent that existing institutions and mechanisms cannot achieve this end, they must be restructured or, if necessary, replaced.

2. Safeguarding of the base for productive fisheries, within the complex of demands on the aquatic system, e.g. through resource-use management on a total-ecosystem basis and through resource enhancement or redevelopment.

This requirement is particularly relevant for anadromous species like the salmon, whose natural habitat can be readily manipulated.

However, enhancement and redevelopment can be considered in relation to demersal and pelagic resources because of the impact (for good as well as ill) of human activity on the marine environment.

3. Incorporation in resource-management models, not only of biological and environmental, but also of major social and economic components of the system.
4. Basing total allowable catches (TAC's) and annual catch quotas on economic and social requirements (including the requirement for stability), rather than on the biological-yield capability of a fish stock or stocks.

Where a resource is exploited internationally, it may be necessary to choose between:

- a) optimizing returns in the domestic fishery, e.g. by an appropriate reduction in foreign-fleet operations;
- b) optimizing economic and social benefits for the region affected or the nation as a whole, e.g. through leasing to other countries the right to exploit certain stocks, if this were proved desirable.

5. An equitable distribution of access to resource use among geographic areas and groups, e.g. vessel and gear types.

The distribution of benefits from the several stages of the fisheries and related industries is involved here and the objective is constrained by the existence of a minimum level of employment acceptable regionally or sub-regionally.

Economic Development

6. Optimal production capacity, application of technology, craft mix and length of operating season in the fishing fleets.

7. Optimal efficiency in port markets.

The issue here is that of the sensitivity of dockside (ex vessel) prices to price movements in product markets. To the extent that port markets perform imperfectly in this respect, reorganization may be desirable. Some options would be a) separating the profit centre in catching from that in the other divisions of integrated catching/processing/marketing enterprises or b) establishing vertical integration forward from the primary-industry base, e.g. through a producers' cooperative organization.

8. Full realization of economies of location and scale in the fish-processing sector.

This implies spatial reorganization, with due regard for resource availability, the role of feeder plants in raw-material assembly and the presence of transportation nodes.

9. Elimination or minimization of wastage at all stages of production, e.g. discards at sea and spoilage in handling.

10. An optimal mix of the products derived from fish landings, in terms of returns to the industry and the regional economy.

Elimination of the structural and other rigidities that prevent

disposition of landings in accordance with most profitable end use is implied here, e.g. as between freezing and curing in the case of cod, and as between animal meal and human food use in the case of herring.

11. Optimization of product quality, product diversification and value added in fish processing.

This implies maximum efficiency in responding to demand in domestic and export markets.

12. Maximization of the competitive position of the fish trade in international product markets.

Issues relating to the desirability and feasibility of vertical integration forward into export markets, as well as to national vs. foreign ownership and/or control are raised here. Among other things, a choice is involved between a) extending Canadian ownership in selected sectors of the fisheries and b) developing the primary and/or secondary sectors, at least in part, through joint-ownership arrangements with interests abroad.

13. An optimal combination of public and private investment for development of the fisheries.

14. Maximum practicable efficiency in intelligence services for the fishing industry and the fish trade.

Predictive or forecasting capability, with reference to resource and environmental conditions, and mechanisms for the "early warning" of market fluctuations require fundamental re-assessment and improvement.

Social/Cultural Development

15. Minimization of the socially and culturally disruptive impact of industrial and trade reconstruction.

Providing that achievement of other developmental objectives is not thereby stultified, the implementation of programs of industrial restructuring or rationalization must be phased in accordance with this objective.

16. Assurance of a cadre of skilled labour for the fisheries and of the attractiveness of fishing as a full-time occupation.

17. Assurance of acceptable employment opportunity for those displaced as a result of industrial restructuring.

18. An adequate level of compensation for losses accruing from industrial restructuring.

Such compensation must also meet the criteria a) that it not be a disincentive to recruitment into other employment and b) that it be capable of being eventually phased out.

19. Maximum efficiency in the design and implementation of developmental programs.

Planning for development must take account, for example, of the impact of alternative structures on relative wage rates as between fisheries and other industries and ensure that, after restructuring has been completed, the equity of income distribution in the communities affected and in society generally is better than it was before.

20. The development in fishing communities of an internal momentum for economic and social growth and toward the fullest possible degree of self-determination.

Industrial restructuring or rationalization must be planned and implemented so as to encourage this.

APPENDIX II

TRENDS IN THE COMMERCIAL FISHERIES OF CANADA

1955-1974

TABLE 1

Annual Per Capita Consumption of Fish^{1/} as Food in Canada, 1955-74
(Edible Weight)

<u>Year</u>	<u>Fresh & Frozen</u>		<u>Cured^{2/}</u>		<u>Canned</u>		<u>Total</u>	
	<u>Products</u>		<u>Products</u>		<u>Products</u>		<u>All Products</u>	
	lb.	kg.	lb.	kg.	lb.	kg.	lb.	kg.
1955	7.3	3.3	1.8	0.8	4.5	2.1	13.6	6.2
1956	7.2	3.3	1.7	0.8	4.5	2.0	13.4	6.1
1957	6.9	3.1	1.9	0.9	4.7	2.1	13.5	6.1
1958	7.5	3.4	1.9	0.9	4.1	1.8	13.5	6.1
1959	7.6	3.4	1.8	0.8	3.9	1.8	13.3	6.0
1960	7.7	3.5	1.8	0.8	3.2	1.5	12.7	5.8
1961	7.2	3.3	1.7	0.8	4.1	1.8	13.0	5.9
1962	7.1	3.2	1.6	0.7	4.3	2.0	13.0	5.9
1963	7.7	3.5	1.4	0.6	4.1	1.9	13.2	6.0
1964	7.2	3.3	1.4	0.6	4.2	1.9	12.8	5.8
1965	7.5	3.4	1.4	0.6	3.9	1.8	12.8	5.8
1966	7.2	3.3	1.3	0.6	4.0	1.8	12.5	5.7
1967	7.2	3.3	1.2	0.5	3.9	1.8	12.3	5.6
1968	7.3	3.3	1.2	0.5	3.9	1.8	12.4	5.6
1969	7.6	3.4	1.0	0.5	3.5	1.6	12.1	5.5
1970	7.0	3.2	0.8	0.4	3.8	1.7	11.6	5.3
1971	7.1	3.2	0.9	0.4	3.9	1.8	11.9	5.4
1972	7.0	3.2	0.8	0.3	4.6	2.1	12.4	5.6
1973	7.1	3.2	0.8	0.4	4.2	1.9	12.1	5.5
1974	7.5	3.4	0.7	0.3	4.4	2.0	12.6	5.7

^{1/} Including shellfish, i.e. crustaceans and mollusks.

^{2/} That is, smoked, salted, pickled, etc.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 2

Employment in the Commercial Fisheries of Canada, 1955-74

<u>Year</u>	<u>Primary Sector</u> ^{1/}			<u>Secondary Sector</u> ^{2/}		
	<u>Pacific</u>	<u>Central</u>	<u>Atlantic</u>	<u>Pacific</u>	<u>Central</u>	<u>Atlantic</u>
	<u>Coast</u> no.	<u>Area</u> no.	<u>Coast</u> no.	<u>Coast</u> no.	<u>Area</u> no.	<u>Coast</u> no.
1955	12,800	17,800	47,900	3,400	n.a.	11,200
1956	11,800	15,800	47,000	3,400	n.a.	11,800
1957	13,000	17,900	48,100	3,300	n.a.	10,900
1958	15,300	20,100	47,600	3,100	n.a.	11,200
1959	15,500	18,300	46,300	3,000	n.a.	11,100
1960	15,200	17,700	45,300	2,600	n.a.	10,800
1961	16,800	16,900	44,600	3,600	600	10,500
1962	16,400	16,700	45,700	3,700	800	10,700
1963	16,600	17,300	47,800	3,400	900	11,300
1964	13,300	16,200	48,600	3,400	900	11,600
1965	13,000	15,800	49,300	3,300	900	13,000
1966	12,000	15,300	45,900	3,400	900	14,000
1967	12,100	13,900	45,200	3,200	900	13,900
1968	12,100	11,400	45,700	3,400	900	15,100
1969	10,900	11,100	42,900	2,700	900	15,500
1970	11,600	9,700	41,800	2,800	900	15,500
1971	11,000	8,100	39,700	2,600	900	15,000
1972	9,900	7,700	39,700	3,600	1,000	15,500
1973	11,700	8,000	39,000	3,700	1,100	16,600
1974	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

1/ The fishing fleets.

2/ Processing plants.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 3

Value of Fishing Craft in the Commercial Fisheries of Canada, 1955-74

(\$ million, current)

<u>Year</u>	<u>Pacific Coast</u>	<u>Central Area</u>	<u>Atlantic Coast</u>	<u>Total</u>
1955	42.6	5.3	32.8	80.7
1956	43.1	5.1	33.9	82.1
1957	45.7	5.6	37.6	88.8
1958	45.2	5.4	33.3	84.0
1959	46.8	6.2	36.9	90.0
1960	49.6	6.1	40.6	96.3
1961	53.8	6.0	42.0	101.8
1962	57.9	6.2	48.3	112.4
1963	71.1	6.8	65.7	143.6
1964	76.6	6.7	76.3	159.6
1965	77.0	6.7	91.1	174.8
1966	75.8	7.2	111.5	194.4
1967	88.4	6.1	152.6	247.1
1968	93.0	6.2	168.1	267.3
1969	101.6	6.0	161.6	269.3
1970	106.0	5.7	161.6	273.3
1971	107.8	5.4	160.0	273.2
1972	114.0	5.5	165.0	284.4
1973	142.5	5.8	189.2	337.5
1974	n.a.	n.a.	n.a.	n.a.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 4

Indices of Production and Price in the Commercial Fisheries of Canada, 1955-74

(1960-62 = 100)

<u>Year</u>	<u>Physical Volume of Production</u>	<u>Port-Market Prices^{1/}</u>
1955	97	84
1956	101	91
1957	100	84
1958	106	97
1959	98	96
1960	92	98
1961	99	99
1962	109	107
1963	109	106
1964	109	121
1965	105	138
1966	122	134
1967	111	139
1968	124	142
1969	109	174
1970	116	173
1971	108	185
1972	107	218
1973	113	288
1974	95	317

^{1/} That is, prices at dockside or ex vessel.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 5

Value^{1/} of Fishery Production in Canada, by Region, 1955-74
 (\$ million, current)

<u>Year</u>	<u>Pacific Coast</u>	<u>Central Area^{2/}</u>	<u>Atlantic Coast</u>	<u>Total All Regions</u>
1955	61.5	18.6	104.7	184.8
1956	68.2	20.6	108.0	196.8
1957	64.1	19.2	105.1	188.4
1958	98.2	20.6	113.9	232.7
1959	68.1	18.2	117.8	204.1
1960	55.2	19.3	124.8	199.3
1961	79.7	19.3	124.8	223.8
1962	100.1	20.3	140.1	260.5
1963	80.1	19.6	158.9	258.6
1964	97.9	19.0	178.3	295.2
1965	89.9	21.2	201.6	312.7
1966	123.7	20.6	212.2	356.5
1967	104.5	16.3	209.2	330.0
1968	123.9	19.8	240.4	384.1
1969	87.9	23.0	271.0	381.9
1970	123.3	24.9	277.8	426.0
1971	120.2	25.2	316.4	461.8
1972	159.1	31.6	354.7	545.4
1973	285.0	38.5	462.7	786.2
1974	220.5	37.0	424.7	682.2

1/ F.O.B. processing plant.

2/ Includes all freshwater production.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 6

Value of Fishery Production in Canada, by Major Product Groups, 1955-74
(\$ million, current)

Year	Pacific		Atlantic			All Other ^{5/}	Grand Total	
	Fresh & Frozen ^{1/}	Canned ^{2/}	Fresh & Frozen Finfish _{3/}	Shellfish	Cured			Canned ^{4/}
1955	16.1	34.7	39.0	23.4	26.7	6.9	38.0	184.8
1956	21.5	34.0	39.9	23.3	23.4	11.6	43.1	196.8
1957	17.3	38.4	42.6	20.2	23.7	11.3	34.9	188.4
1958	24.8	60.3	50.2	20.6	23.3	11.4	42.1	232.7
1959	18.6	37.6	51.9	23.4	21.0	12.9	38.7	204.1
1960	22.7	25.9	50.3	27.9	24.1	15.9	32.5	199.3
1961	21.2	48.2	51.5	27.8	23.9	11.9	39.3	223.8
1962	28.7	59.0	59.5	27.5	24.7	16.4	44.7	260.5
1963	27.7	37.0	68.4	34.6	27.1	15.4	48.4	258.6
1964	32.5	48.5	76.0	42.2	28.8	14.7	52.5	295.2
1965	33.3	38.8	87.4	51.9	24.9	16.9	59.5	312.7
1966	39.6	68.5	94.0	42.2	27.0	19.3	65.9	356.5
1967	33.3	62.1	84.9	43.2	30.3	18.4	57.8	330.0
1968	43.6	72.6	94.2	58.7	27.1	22.1	65.8	384.1
1969	46.9	33.9	107.4	70.2	26.5	21.6	75.4	381.9
1970	54.1	61.0	113.6	67.2	25.7	26.8	77.6	426.0
1971	44.1	67.1	141.3	76.6	32.7	26.0	74.6	461.4
1972	74.9	56.5	157.7	91.8	33.0	32.6	98.9	545.4
1973	97.8	129.1	217.7	110.2	42.0	40.4	149.0	786.2
1974	57.0	115.3	168.6	105.4	49.8	49.6	136.5	682.2

1/ Predominantly salmon and halibut.

2/ Principally salmon species.

3/ Chiefly filleted groundfish products, including blocks.

4/ Mainly herring and certain shellfish species.

5/ Including industrial, i.e. non-food products, and products of the freshwater fisheries.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974.

TABLE 7

Imports of Fishery Products into Canada, by Area of Origin, 1955-74
(\$ million, current)

<u>Year</u>	<u>United States</u>	<u>Europe</u>	<u>Other</u>	<u>Total</u>
1955	*	*	*	12.5
1956	*	*	*	17.4
1957	*	*	*	16.5
1958	*	*	*	17.4
1959	*	*	*	16.3
1960	*	*	*	17.2
1961	*	*	*	20.6
1962	*	*	*	21.9
1963	*	*	*	22.8
1964	*	*	*	23.2
1965	14.5	4.9	8.5	27.9
1966	17.5	4.9	8.9	31.3
1967	18.1	6.1	12.6	36.8
1968	16.9	5.8	12.3	35.0
1969	24.1	6.1	12.1	42.3
1970	31.0	7.5	16.0	54.5
1971	33.7	8.3	18.9	60.9
1972	40.4	10.8	30.4	81.6
1973	54.2	15.1	42.0	111.3
1974	58.1	17.9	44.2	120.2

* Not readily available at time of compilation.

Source: Marketing Branch, Fisheries & Marine Service, DOE.

TABLE 8

Annual Value of Exports of Fishery Products from Canada, by Destination, 1955-74
(\$ million, current)

<u>Year</u>	<u>United States</u>	<u>European Countries</u>	<u>Other Countries</u>	<u>All Countries</u>
1955	92.0	14.8	22.0	128.8
1956	96.8	15.3	21.6	133.7
1957	97.0	13.3	22.2	132.5
1958	103.3	31.6	20.1	155.0
1959	98.6	28.8	20.4	147.8
1960	98.8	18.0	21.3	138.1
1961	103.8	20.1	19.4	143.3
1962	114.3	22.7	19.6	156.6
1963	115.9	32.8	23.4	172.1
1964	130.9	46.5	25.2	202.6
1965	150.0	39.4	23.9	213.3
1966	151.0	41.6	27.2	219.8
1967	145.0	60.9	29.5	235.4
1968	174.0	55.0	29.0	258.0
1969	188.3	61.8	29.0	279.1
1970	202.3	49.0	28.7	280.0
1971	201.4	63.6	30.0	295.0
1972	229.7	73.7	47.0	350.4
1973	294.1	117.1	87.5	498.7
1974	264.0	98.5	74.2	436.7

Source: Marketing Branch, Fisheries & Marine Service, DOE.

TABLE 9

Price Relatives^{1/} for Selected Species as Landed in Canada, 1955-74
(1955 = 100)

<u>Year</u>	<u>Pacific</u> <u>Salmon</u> ^{2/}	<u>Atlantic</u> <u>Lobster</u>	<u>Atlantic</u> <u>Cod</u>
1955	100	100	100
1956	133	102	101
1957	101	96	95
1958	145	106	100
1959	137	112	107
1960	173	106	110
1961	152	112	122
1962	132	126	130
1963	135	141	139
1964	173	171	156
1965	204	194	166
1966	168	174	180
1967	192	196	183
1968	180	193	165
1969	249	217	161
1970	207	239	183
1971	238	257	226
1972	217	329	262
1973	383	336	368
1974	357	356	450

1/ Based on average annual prices.

2/ Includes all species, which range in price levels and the mix of which varies from year to year.

Source: Marketing Branch, Fisheries & Marine Service, DOE.

TABLE 10

Price Relatives^{1/} for Selected Groundfish Products in the U.S. Market, 1955-74
(1955 = 100)

<u>Year</u>	<u>Frozen Fillets</u>		<u>Frozen Blocks</u>
	<u>Cod</u>	<u>Flounders^{2/}</u>	<u>All Species</u>
1955	100	100	100
1956	100	95	95
1957	102	97	97
1958	111	98	98
1959	113	99	102
1960	116	97	105
1961	125	98	106
1962	125	103	101
1963	127	99	104
1964	130	106	114
1965	142	105	125
1966	154	108	127
1967	156	111	117
1968	155	111	111
1969	161	137	115
1970	177	154	132
1971	241	151	181
1972	290	172	202
1973	367	205	253
1974	n.a.	n.a.	n.a.

^{1/} Calculated from U.S. import statistics.

^{2/} The term "flounder" represents a mix of species, including plaice, sole, turbot, etc.

Source: Marketing Branch, Fisheries & Marine Service, DOE.

TABLE 11

Quantity of Groundfish Landings in Canada, by Region and Major Species, 1955-74
(thousand metric tons)

<u>Year</u>	<u>Pacific</u>		<u>Atlantic</u>			<u>Sub-Total</u>	<u>Grand Total</u>
	<u>All Species</u>	<u>Cod</u>	<u>Redfish</u>	<u>Flounders^{1/}</u>	<u>Other</u>		
1955	16.2	262.9	20.0	37.6	94.4	414.9	431.1
1956	19.8	296.7	27.0	33.7	108.9	466.3	486.1
1957	21.2	291.1	21.0	39.2	96.0	447.3	468.5
1958	22.6	240.8	27.9	38.4	89.6	396.7	419.3
1959	22.2	289.9	18.4	41.4	91.1	440.8	463.0
1960	24.1	274.2	21.3	55.1	86.6	437.2	461.3
1961	20.5	234.5	25.5	48.7	92.8	401.5	422.0
1962	23.5	265.5	27.7	46.4	97.3	436.9	460.4
1963	24.8	276.6	37.8	57.0	83.5	454.9	570.7
1964	26.0	259.2	36.4	73.4	94.3	463.3	489.3
1965	30.9	261.0	59.1	92.0	90.3	502.4	433.3
1966	34.4	255.4	83.1	105.6	101.5	545.6	580.0
1967	24.5	236.3	85.9	107.4	97.3	526.9	551.4
1968	27.7	269.2	97.4	106.6	87.1	560.3	588.0
1969	28.2	245.1	96.7	123.7	80.1	545.6	573.8
1970	26.5	219.0	108.5	135.6	62.4	525.5	552.0
1971	24.9	203.8	112.8	128.1	71.5	516.2	541.1
1972	26.8	182.6	109.9	117.0	64.8	474.3	501.1
1973	20.6	147.2	158.4	122.2	70.4	498.2	518.8
1974	17.0	130.2	86.3	98.7	62.4	377.6	394.6

^{1/} Includes all small flatfishes, i.e. all flatfish species except halibut.

Source: Marketing Branch, Fisheries & Marine Service, D0E.

TABLE 12

Value^{1/} of Groundfish Landings in Canada, by Region and Major Species, 1955-74
 (\$ million, current)

<u>Year</u>	<u>Pacific</u> <u>All Species</u>	<u>Cod</u>	<u>Redfish</u>	<u>Atlantic</u> <u>Flounders^{2/}</u>	<u>Other</u>	<u>Sub-Total</u>	<u>Grand Total</u>
1955	3.5	14.4	1.0	2.6	6.5	24.5	28.0
1956	6.6	16.4	1.3	2.3	7.6	27.6	34.2
1957	5.5	15.1	1.0	2.6	7.4	26.1	31.6
1958	7.4	13.2	1.5	2.6	7.6	24.9	32.3
1959	7.0	17.0	1.0	2.8	8.4	29.2	36.2
1960	6.7	16.5	1.2	3.8	7.3	28.8	35.5
1961	7.3	15.6	1.5	3.3	8.1	28.5	35.8
1962	12.2	18.9	1.6	3.2	9.2	32.9	45.1
1963	9.6	21.0	2.2	4.0	9.2	36.4	46.0
1964	10.1	22.1	2.2	5.2	10.7	40.2	50.3
1965	13.5	23.6	3.4	6.5	10.9	44.4	57.9
1966	14.8	25.1	5.1	7.8	13.4	51.4	66.2
1967	8.7	23.7	5.0	8.4	12.0	49.1	57.8
1968	9.7	24.4	5.5	8.1	11.4	49.4	59.1
1969	16.5	21.6	5.8	11.0	11.2	49.6	66.1
1970	12.8	21.9	7.8	14.7	10.1	54.5	67.3
1971	10.7	25.1	8.7	13.9	11.9	59.6	70.3
1972	17.1	26.2	9.5	14.0	11.5	61.2	78.3
1973	14.3	29.7	17.3	18.2	15.5	80.7	95.0
1974	9.5	32.1	9.3	16.8	15.2	73.4	82.9

1/ Ex vessel

2/ Includes all small flatfishes, i.e. all flatfish species except halibut.

Source: Marketing Branch, Fisheries & Marine Service, DOE.

TABLE 13

Nominal Catches^{1/} of Groundfish in the Northeast Pacific^{2/} (INPFC Area), 1955-74
(thousand metric tons)

Year	Total	Total	Canadian
	All Countries ^{3/}	Canada ^{4/}	Share
	T	T	%
1955	n.a.	n.a.	n.a.
1956	n.a.	n.a.	n.a.
1957	n.a.	n.a.	n.a.
1958	n.a.	n.a.	n.a.
1959	n.a.	n.a.	n.a.
1960	n.a.	n.a.	n.a.
1961	100	32	32.0
1962	104	33	31.7
1963	112	32	28.6
1964	116	32	27.6
1965	167	41	24.6
1966	213	46	21.6
1967	532	34	6.4
1968	382	38	10.0
1969	411	39	9.5
1970	431	32	7.4
1971	383	31	8.1
1972	410	34	8.3
1973	n.a.	25	n.a.
1974	n.a.	22	n.a.

1/ Landings converted to "round" (live) weight.

2/ Excluding southeastern Bering Sea, where the catch in 1973 approximated 2.1 million metric tons, the Canadian share of which was minuscule.

3/ Catches by the fleet of the U.S.S.R. are included from 1967 onward.

4/ The catch of halibut, which, until 1970, constituted 60 per cent of the Canadian catch, has declined in relative importance: it is now about 20 per cent of the total annual catch of groundfish.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974, and supplementary reports.

TABLE 14

Nominal Catches^{1/} of Salmon in the Northeast Pacific (INPAC Area), 1955-74

(thousand metric tons)

<u>Year</u>	<u>Total</u> <u>All Countries</u> t	<u>Total</u> <u>Canada</u> t	<u>Canadian</u> <u>Share</u> %
1955	365	61	16.7
1956	348	53	15.2
1957	366	62	16.9
1958	406	84	20.7
1959	321	50	15.6
1960	291	35	12.0
1961	356	57	16.0
1962	331	76	22.9
1963	330	56	17.0
1964	344	58	17.0
1965	341	43	12.7
1966	381	76	20.0
1967	312	63	20.2
1968	347	83	23.8
1969	300	38	12.6
1970	375	72	19.3
1971	349	63	18.1
1972	294	77	26.1
1973	n.a.	87	n.a.
1974	n.a.	64	n.a.

^{1/} Landings converted to "round" (live) weight.

Source: Annual Statistical Review of Canadian Fisheries, Vol. 7, 1974

TABLE 15

Interception of Migrating Salmon, Pacific Coast, 1967-72

<u>Year</u>	<u>Salmon of Canadian Origin Intercepted by U.S. Fleets</u>	<u>Salmon of U.S. Origin Intercepted by Canadian Fleets</u>	<u>Net Balance</u>
	no.	no.	no.
1967	7,629,000	2,375,000	-5,254,000
1968	2,709,000	2,637,000	- 72,000
1969	3,994,000	1,659,000	-2,335,000
1970	2,876,000	2,476,000	- 400,000
1971	6,986,000	3,157,000	-3,829,000
1972	3,255,000	2,342,000	- 913,000

Source: Estimate by Fisheries and Marine Service, DOE.

TABLE 16

Tonnage of Fishing Fleets ^{1/} in the Northwest Atlantic, 1959-1974

<u>Year</u>	<u>All Countries</u>		<u>Canada</u>	
	<u>Number</u>	<u>Total</u>	<u>Number</u>	<u>Total</u>
	<u>of Vessels</u>	<u>Tonnage</u>	<u>of Vessels</u>	<u>Tonnage</u>
	no.	tons	no.	tons
1959	1,146	507,970	211	26,742
1962	1,416	599,354	272	34,525
1965	1,779	1,019,432	410	64,729
1968	2,005	1,374,262	558	112,184
1971	2,040	1,505,852	534	115,752
1974	2,057	1,691,409	524	120,044

^{1/}Includes only craft of 50 gross tons and over.

Source: International Commission for the Northwest Atlantic Fisheries, List of Fishing Vessels, 1959, 1962, 1965, 1968, 1971, 1974.

TABLE 17

Nominal Catches^{1/} of Groundfish in the Northwest Atlantic (ICNAF Area), 1955-74
(thousand metric tons)

	<u>Total</u> <u>All Countries</u> t	<u>Total</u> <u>Canada</u> t	<u>Canadian</u> <u>Share</u> %
1955	1,499	482	32.2
1956	1,544	532	34.5
1957	1,579	528	33.4
1958	1,631	562	34.5
1959	1,762	527	29.6
1960	1,844	539	29.2
1961	1,962	452	23.0
1962	1,958	519	26.5
1963	2,275	544	23.9
1964	2,462	527	21.4
1965	2,829	571	20.2
1966	2,690	616	22.9
1967	2,607	589	22.6
1968	2,769	621	22.4
1969	2,444	606	24.8
1970	2,090	578	27.6
1971	2,155	568	26.3
1972	2,099	520	24.8
1973	2,096	541	25.8
1974	1,743	418	24.0

^{1/} Landings converted to "round" (live) weight.

Source: International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin, Vols. 5 - 24, 1957-1976.

TABLE 18

Nominal Catches^{1/} of Herring in the Northwest Atlantic (ICNAF Area), 1955-74

(thousand metric tons)

<u>Year</u>	<u>Total</u> <u>All Countries</u>	<u>Total</u> <u>Canada^{2/}</u>	<u>Canadian</u> <u>Share</u>
	t	t	%
1955	149	91	-
1956	152	89	-
1957	172	101	-
1958	184	106	-
1959	154	109	-
1960	180	112	-
1961	179	85	47.5
1962	344	112	32.6
1963	285	114	40.0
1964	303	141	46.5
1965	265	183	69.1
1966	431	256	59.4
1967	594	345	58.1
1968	952	528	55.5
1969	967	482	49.8
1970	852	478	56.1
1971	747	426	57.0
1972	549	297	54.1
1973	485	225	46.4
1974	433	225	52.0

^{1/}Landings converted to "round" (live) weight.

^{2/}Nominal catch in territorial waters not reported until 1961.

Source: International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin, Vols, 5 - 24, 1957-1976

TABLE 19

The Nominal-Catch Trend in the World's Fisheries, 1955-74

<u>Year</u>	<u>Nominal Catch</u> ^{1/} Metric Tons
1955	28,900,000
1956	30,800,000
1957	31,700,000
1958	33,300,000
1959	36,900,000
1960	40,200,000
1961	43,600,000
1962	44,800,000
1963	46,600,000
1964	51,900,000
1965	53,200,000
1966	57,300,000
1967	60,400,000
1968	63,900,000
1969	62,700,000
1970	70,000,000
1971	70,200,000
1972	65,600,000
1973	65,700,000
1974 (preliminary)	69,300,000

^{1/}Landings converted to "round" (live) weight.

Source: Food and Agriculture Organization of the United Nations.
Yearbook of Fishery Statistics, Vols. 7 - 36, 1957-1973

TABLE 20

International Trade^{1/} in Fishery Products, 1955-74

<u>Year</u>	<u>Exports</u> \$U.S.	<u>Imports</u> \$U.S.
1955	796,000,000	863,000,000
1956	931,000,000	979,000,000
1957	1,007,000,000	1,116,000,000
1958	1,101,000,000	1,170,000,000
1959	1,181,000,000	1,250,000,000
1960	1,195,000,000	1,300,000,000
1961	1,280,000,000	1,404,000,000
1962	1,506,000,000	1,622,000,000
1963	1,531,000,000	1,714,000,000
1964	1,744,000,000	1,973,000,000
1965	1,943,000,000	2,181,000,000
1966	2,124,000,000	2,406,000,000
1967	2,114,000,000	2,414,000,000
1968	2,226,000,000	2,582,000,000
1969	2,441,000,000	2,787,000,000
1970	2,894,000,000	3,274,000,000
1971	3,343,000,000	3,735,000,000
1972	4,020,000,000	4,526,000,000
1973	5,233,000,000	5,943,000,000
1974	n.a.	n.a.

^{1/}The trade of 151 countries, which represent 85-90 per cent of the world's fishery production.

Source: Food and Agriculture Organization of the United Nations, Yearbook of Fishery Statistics, Vols. 8 - 37, 1957-1973.

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