THE SENATE OF CANADA

THE MARKETING OF FISH IN CANADA

REPORT ON THE EAST COAST FISHERIES

INTERIM REPORT III

Standing Senate Committee on Fisheries

December 1989

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" HIGHLIGHTS "

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HIGHLIGHTS OF THE REPORT ON THE EAST COAST FISHERIES

The concept of "marketing", which may be defined in terms of fisheries as the total process of moving fish and seafood from the water to the dinner plate, offers a logical framework for study. It not only recognizes the importance of the consumer, it affords the opportunity to address the fishery as a whole, including resource management and harvesting, the primary building blocks of a stable industry.

The fisheries challenge faced by government is to protect the resource and at the same time maximize its economic benefits for the people who harvest, process, sell and consume fish. Since the industry's economic performance is very much linked to fisheries management, discussions in the course of the Committee's hearings often led to consideration of more fundamental issues affecting supply. Many groups and individuals repeatedly warned the Committee last year that the fishery was at an important crossroads, and that unless fisheries management issues were addressed more intensively and comprehensively, the industry would soon be in very serious trouble.

Measures to conserve the resource are an essential part of any strategy to market it. The following are some of the major points outlined in the Report:

- In modern fisheries management, conservation is generally understood to include not only fish, but also their habitats (i.e., the aquatic environment). Fish habitats that sustain the fishery resource are the basis for a sound industry. In the United States, the more serious problem of marine pollution had, to some extent, an adverse impact on seafood consumption in 1988. Environmentally, Canada can be much tougher.

- It would be an understatement to say that the seal population, especially that of grey seals, arouses strong feelings among fishermen, who clearly see its growth as a threat to their livelihood. Seals are detrimental to fishing interests for three major reasons: parasite contamination, damage to fishing gear and catches, and competition for fish. The Malouf Commission estimated in 1986 that some 5.26 million tonnes of a wide variety of fish and shellfish were consumed by seals in the Northwest Atlantic Ocean, a phenomenal amount which, if accurate, makes seals the world's third largest consumer of marine fish, after Japan and the Soviet Union. The Department of Fisheries and Oceans has undertaken a scientific program to find alternative ways, such as fertility control, to control the grey seal population. If a solution is not forthcoming within two years, the Senate Fisheries Committee recommends, among other things, that the federal government proceed with a cull and with the industry jointly plan and fund a public relations campaign to counter any future boycotts of Canadian products resulting from the seal management issue.

- Foreign overfishing of stocks straddling the 200-mile limit (on the "nose" and "tail" of the Grand Banks) can no longer be tolerated and requires a much firmer response by the Government of Canada. The Prime Minister, the Secretary of State for External Affairs, and the Minister of Fisheries and Oceans should develop a strategy to establish full functional Canadian fisheries jurisdiction over the whole Continental Shelf.

- Canada's claim to 200 miles means little unless those fishing in its waters follow the regulations that have been set. There are opportunities for collusion between fishermen and processors, whereby catches are not always properly recorded, and the amount taken or the area of capture misreported. The penalties for domestic violators of fisheries regulations should be increased so that sanctions for fishing illegally greatly exceed potential gains.

- A great number of fishermen suspected that scientific assessments were being based on poor data or were sometimes modified because of social, economic or even political considerations. Resistance to scientific advice can lead to the misreporting of catches, the very information upon which assessments are based and fisheries management decisions taken. The Department should pursue means to improve the frequency and quality of communications between fishermen and fisheries managers and scientists. Steps should be taken to involve the participation of actual fishermen in the resource assessment, consultative and decision-making process.

▶ The Committee learned that a large quantity of small fish was being landed in many areas of the East Coast. Harvesting small fish is not only a destructive fishing practice with grave implications for the long-term health of stocks, but also an unconscionable waste if dead fish are dumped overboard. The economics of processing small fish are just as straight-forward. Objections were also voiced during the Committee's hearings against fishing of spawning stocks. The Department should promote fishing methods that reduce the harvesting of small and immature fish; fishing in areas where there are spawning stocks should be severely curtailed.

▶ Fisheries science is the foundation of all DFO's management programs aimed at ultimately benefiting the entire industry. A strong and credible research program is essential to DFO's role in protecting and managing the fishery resource. The drastic change in the perception of stock size for northern cod raises the question of the accuracy of scientific advice for other species and stocks currently exploited or which may be exploited in the future. The Department should significantly increase its support of fisheries research to ensure that it has at its disposal a pool of highly qualified scientists. Additional studies are urgently needed, not only to increase the Department's knowledge of the dynamics of individual species and stocks in the Atlantic region, but also their interaction and interdependencies in the ecosystem.

▶ A system of shared jurisdiction would likely lead to interprovincial conflicts that could undermine conservation. Should the 1987 Constitutional Accord be ratified, consideration should be given to amending the Constitution of Canada by moving the subject of fisheries from the agenda of the constitutional meetings to the agenda of the annual conferences of the first ministers on the economy.

The paradox for many who appeared before the Committee was the industry's inability to capitalize wisely on the richness of the resource. The Canadian industry has been slow in changing from a traditional volume orientation (i.e., fishing whatever can be caught and then trying to sell that product) to a market-driven approach. The Report suggests that:

▶ In view of the apparent disparity in marketing capability between large and small companies on the East Coast, governments expand the range of marketing services to fishing companies needing professional assistance.

▶ Future economic gains will come from creating greater value from a limited volume of fish. The Committee deplores wasteful harvesting and processing practices. For example, the flesh component of groundfish such as cod is about 60% of dressed weight, but only about half of this amount is utilized (i.e., over two-thirds of potentially valuable protein is thrown away). Every effort should be made to determine possible uses for by-catches. Governments should devise policies which encourage the processing of all usable parts of harvested fish.

▶ Literally thousands of tonnes of the region's fish inventory (underutilized or unutilized resources) go unharvested each year either because of environment factors, inadequate or inappropriate harvesting and processing technology, and marketing constraints. In the context of the United Nations Law of the Sea, once Canada has established its harvesting capabilities and determined the quota it needs, the surplus is made available to other countries; foreign allocations amounted to about 212,000 tonnes in 1988. The Committee suggests that DFO formulate a national strategy to develop underutilized species and stocks and establish a product and market development unit in support of the industry; the federal government should increase its technological and financial assistance.

▶ The fishing industry's greatest challenge is in expanding its market frontiers. The Atlantic groundfish sector, in particular, is so dependent on the United States that any slight movement in demand sends shockwaves throughout the system. While the industry recognizes the potential of non-traditional markets and specialized segments or niches, much needs to be done to promote a strategy based on the proverb "don't put all your eggs in one basket". The potential for developing the domestic market should not be overlooked; it would appear that because of its marketing patterns, the industry has been under-supplying markets in this country. The Committee recommends that the

Department of External Affairs, in coordination with DFO, provide an ongoing and quarterly assessment of seafood export markets to assist the industry in formulating country-specific strategies, that government and industry seriously reconsider the Marketing Commission and Product Marketing Councils outlined in the Report of the Task Force on Atlantic Fisheries, and that the federal government commission a comprehensive study of the size, nature and potential of the Canadian seafood market.

▶ Although some Canadian fish processors have done much to enhance the value of their products, the industry lags behind other food industries in this respect. The benefits to the Atlantic economy from more secondary processing (i.e., value addition) and the diversification to new fishery products include the maintenance and growth in fishery-related employment and enhanced competitiveness. The need to upgrade the product mix for groundfish, in particular, is a formidable challenge. Market segments which use commodity-type products are generally price-sensitive. Continuing and marked improvements in quality have made species such as Alaska pollock and South American Hake acceptable alternatives to Atlantic cod. The necessary financial assistance should be provided by government to help existing small-and-medium-sized fish plants to become better equipped for producing value-added products. Research and development in surimi processing should be stepped up and funded jointly by government and industry.

▶ Aquaculture (fish farming) is gaining momemtum throughout the world. A dramatic increase in worldwide aquaculture production expected in the coming years should make Canadian producers very wary about their future markets since it is not yet clear whether the increase in supply will be matched by a similar increase in demand. For farmed Atlantic salmon, the Committee was told that production volumes had already contributed to a drop in world prices. The industry in Canada must act now to develop innovative marketing strategies based on market intelligence, quality assurance and generic advertising. Government support should be provided to analyze market trends and opportunities and to contribute to developing brand image given that competition will intensify in the future.

▶ The trend in demand for seafood is towards premium product forms. Improving product quality is a means to higher net returns from the resource. Canada's Fish Inspection Program should be used as a marketing tool to create awareness among domestic and international consumers that Canadian seafood has undergone the most stringent quality control in the world. The industry and government should consider the establishment of a system of dockside grading and finished product grades and labels. DFO should encourage fishermen to improve fish handling techniques at sea.

▶ Generic domestic and foreign promotions aimed at creating market opportunities for Canadian fish are essential in persuading seafood consumers to think of Canada as a supplier of top-quality seafood products. Generic advertising should be a continuing and sustained effort. Canada's position as one of the world's top seafood exporters is at risk if this country allows aggressive newcomers to make inroads into its established markets.

▶ As one of the world's leading exporters of fishery products, it stands to reason that the Canadian fishery would benefit from reduced impediments to trade. The Canadian fishing industry has yet to face the full implications of the Canada-U.S. Free Trade Agreement, good and/or bad. Indeed, the full significance of the Agreement will become apparent only over the next ten years. The manner in which binational panels and working groups are implemented will be of critical importance to Canada. The federal government should, in no circumstances, make Canada's sovereign right to conserve and manage its fishery resource a trade issue. The Committee is very concerned about the possible repercussions on the East Coast industry of the Canada-U.S. Free Trade Panel's October 1989 ruling on West Coast salmon and herring. The Free Trade Agreement should not be regarded as a substitute for liberalized trading

arrangements, both multilateral and bilateral, with other markets such as the European Community and Japan.

These are but some of the major points of the Senate Fisheries Report. The Committee will consider its work worthwhile if participants in the industry find its suggestions constructive in promoting a more prosperous and secure industry, and if the Report focuses government and public attention on the more salient issues.

THE STANDING SENATE COMMITTEE ON FISHERIES

Chairman: The Honourable Jack Marshall

Deputy Chairman: The Honourable L. Norbert Thériault

and

The Honourable Senators:

Adams, Willie	*MacEachen, Allan J., P.C.
Bielish, Martha P.	Molgat, Gildas
Bonnell, Lorne	*Murray, Lowell, P.C.
Cochrane, Ethel	Patten, William
Corbin, Eymard	Robertson, Brenda M.
Hicks, Henry	Rossiter, Eileen

* Ex Officio Members

Quorum 4

* The Honourable Senators Cottreau, Le Moyne, Macquarrie, Perrault, Phillips, Rousseau, Simard and Watt also served on the Committee at various times.

ORDER OF REFERENCE

Extract from the *Minutes of Proceedings of the Senate*, Tuesday, June 13, 1989:

"Pursuant to the Order of the Day, the Senate resumed debate on the motion of the Honourable Senator Thériault, seconded by the Honourable Senator Kirby:

That the Standing Senate Committee on Fisheries be authorized to examine all aspects of the marketing of fish in Canada, and all implications thereof;

That the papers and evidence received and taken on the subject before the Committee during the 33rd Parliament be referred to the Committee; and

That the Committee present its final report to the Senate no later than 31 October 1989.*

After debate,

The question being put on the motion, it was—

Resolved in the affirmative."

Gordon Barnhart

Clerk of the Senate

* By order of the Senate on September 26, 1989, this date was extended to December 31, 1989.

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PREFACE

In February 1985 the Standing Senate Committee on Agriculture, Fisheries and Forestry was given an Order of Reference pertaining to a study on "the marketing of fish in Canada and all implications thereof." In May 1986, the Standing Senate Committee on Fisheries was separated from the Committee on Agriculture, Fisheries and Forestry to deal exclusively with fisheries matters. The above Order of Reference was referred to the Standing Senate Committee on Fisheries in June 1986.

A report on the freshwater fisheries was published in September 1986, and one on the West Coast fisheries in December 1987. This third report addresses what the Committee considers to be key elements that affect the marketing of East Coast fishery products.

The Committee is indebted to the many individuals and organizations who contributed to this phase of the study. In keeping with its mandate, public hearings were held in cities and towns throughout the Atlantic provinces and in Ottawa. At these hearings, witnesses presented written and oral briefings, and time was allocated to give members of the general public the opportunity to express their views. Considerable testimony concerning the resource, the harvesting, processing and eventual marketing of fishery products was given by what the Committee considers to be a well-balanced mix of government and industry representatives. (A list of witnesses is appended at the end of this report.)

Although this report largely reflects the concerns and ideas brought forward at these hearings, information in this report also came from other sources: past studies and reports on the East Coast fishery, informal meetings with groups and individuals, and visits to fish plants, seafood markets, the Boston Seafood Show and federal government research facilities. Federal and provincial officials also generously contributed their views and knowledge.

Finally, the Committee acknowledges the assistance received from its support staff in the conduct of the study and subsequent preparation of the report: Blair Armitage, Clerk of the Committee; Vince Gobuyan, Director of Research; Claude Emery, Research Officer, Library of Parliament; and Janelle Feldstein, Research/Administrative Assistant to the Committee.

FOREWORD

A study on "the marketing of fish and all implications thereof" is an admittedly broad order of reference. The concept of "marketing," however, which may be defined as the total process of moving goods (and services) from the producer to the end-user or, in terms of fisheries, of moving fish and seafood from the water to the dinner plate, offers a logical framework for study. It not only recognizes the importance of the consumer, it affords the opportunity to address the fishery as a whole, including resource management and harvesting, the primary building blocks for a stable industry.

The successes of the Atlantic fishing industry during the mid-1980s to some extent were due to factors not necessarily within its control. Seafood enjoyed a period of unprecedented demand in world markets, particularly in the United States where public consciousness about health and fitness became more than a fad. No longer was fish considered as a cheap substitute for meat, but rather as an attractive option in itself. A number of events, however, unfolded during the course of this study which adversely affected the marketing of East Coast seafood.

Toward the end of 1987, consumer resistance to high prices for cod, the region's major species of fish, led to a precipitous decline in demand and, consequently, high inventories of frozen products (mainly fillets and blocks). For many, it seemed that the wheel had turned once more in this historically cyclical industry. By the summer of 1988, the Committee learned of the hardship being experienced by groundfish fishermen, as the price offered for their catches was less than half that of the previous year and was close to early 1980s levels. In some cases, there was no buyer interest at all, a problem made worse by poor catches in some inshore areas.

The tainted mussels incident in 1987 undermined the popularity of shellfish and seafood, as did publicity on parasites in fish and marine pollution in 1988. The rise in interest rates and the continued resurgence of the Canadian dollar in relation to the U.S. dollar through most of 1988 and 1989 reduced profit margins across the entire industry.

In 1987, Canada was for the tenth consecutive year the world's number one exporter of fishery products. This country was however displaced by the United States in 1988. It would not be an overstatement to say that 1989 was a terrible year for the Atlantic fishery. Raw material volumes were down and in most cases prices declined. Prospects for 1990 look dim.

Scientific studies earlier this year pointed to a serious decline in the northern cod stock and a further decline in groundfish stocks in waters off Nova Scotia, leading to subsequent quota reductions, plant shutdowns and layoffs. Comparisons are being made

to last year's Prairie drought in the West. A special committee of Cabinet chaired by the Minister of External Affairs has been formed to seek solutions for the problems confronting the Atlantic provinces and the fishing industry.

The fishery's current ills are numerous. Some are well-known but most defy obvious, definitive or easy solutions. Fisheries issues remain controversial and continue to be politically sensitive.

Canada has probably done a better job of managing the fishery than any other country in the world, but its future requires vigilance as never before. Although seafood processors on the East Coast are close to their largest market, the United States, they must not allow themselves to become complacent. There are significant opportunities for making wiser use of the bountiful resource in the region and protecting the industry from the vagaries of the marketplace.

Perhaps the greatest challenge as we head into the 21st century is to ensure that the problems confronting the industry are addressed with stronger political will and action for the long term, and that all sectors and segments of the industry — individual fishermen, plant workers and owners — work together and cooperate to achieve common goals. Bringing about changes will not be easy in an industry made up of diverse interests, and which in the Atlantic region is as much a way of life as it is a business. We believe the basic framework for success is in place, but much remains to be done and this will require genuine commitment by all concerned.

The breadth of issues raised, the multifaceted and dynamic nature of the industry and time constraints in carrying out the work, forced the Committee to focus on the more important issues and prevented it from making more detailed recommendations. In many instances, the information needed to refine and expand on these was simply not available. The dissolution of Parliament also considerably delayed the completion of this report.

The Committee will consider its work worthwhile if participants find its suggestions constructive in promoting a more prosperous, vibrant and secure industry, and if it focuses government and public attention on the more salient issues.

Finally, the Committee is eagerly looking forward to the responses of governments, the industry and the general public to the observations and recommendations in this report.

Jack Marshall
Chairman

CHAPTER ONE

Introduction

> No one can describe the situation in the fisheries . . . today, in anything more appropriate than Churchill's old metaphor of "a riddle wrapped in a mystery inside an enigma". Because you certainly have a labyrinth of themes and trends to deal with.
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> *Proceedings*, 20 June 1988, p. 8

Producing seafood is Canada's oldest industry. It was the cod fishery which drew the first Europeans — Portuguese, French, Spanish, Basque and English fishermen — to Eastern Canada. In fact, long before Columbus "officially" discovered the continent, fishermen had been coming ashore regularly, and building stages on which to dry and salt their catches for transport across the ocean.[1]

The fishery later figured prominently in the colonization of the Atlantic region, and for generations was the sole reason for the existence of many coastal communities. Even when settlers arrived for other reasons, many of them soon turned to catching fish in conjunction with their other occupations. Fishing also had a strong regional impact through links with other sectors, such as shipping and shipbuilding, and over the years became integrated with regional development and profound desires to preserve lifestyles and communities.

The East Coast fishery has, as well, a long history of undergoing severe economic cycles. The record shows periods of boom and bust, with governments responding to each downward spiral every six to seven years with new studies and recommendations. In fact, many of the fishery's current ills are not recent phenomena. Resource fluctuations, insufficient data and information, uncoordinated resource planning and development, lack of control over the fishing effort, inadequate infrastructure, weak markets, poor marketing arrangements, low incomes and productivity, inconsistent product quality, etc.[2] have been the objects of inquiries and reports that stretch back

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(1) See Albert C. Jensen, *The Cod*, Thomas Y. Crowell, New York, 1972.

(2) See for example, Cynthia Lamson, "Fisheries Assessment and Government Response: the Case of the Newfoundland Inshore Fishery" in *Atlantic Fisheries and Coastal Communities: Fisheries Decision-Making Case Studies*, C. Lamson and A.J. Hanson, editors, Dalhousie Ocean Studies Programme, Halifax, 1984, p. 105-132.

into the last century. Counting official commissions alone, there have been over 100 in the past 100 years.[1]

More recently, following the declaration of the 200-mile limit in 1977 and spurred on by expectations that Canadians would have access to more fish, fishermen and processors expanded their operations (largely debt financed) in anticipation of a boom that did not materialize. By 1981, the industry experienced the pinch of depressed markets and large inventories, especially of frozen fish destined for the United States market. The problem was compounded by high interest rates, a relatively strong Canadian dollar which undermined the industry's competitiveness in export markets, and good catches of competing species of fish from other countries. For many firms on the East Coast, the result was dashed expectations, imminent bankruptcy and an appeal for government assistance to prevent yet another collapse of the industry.

The federal government responded by creating a Task Force on Atlantic Fisheries, under the chairmanship of Dr. Michael J. Kirby, in January 1982. The following year, the Report of the Kirby Task Force, "Navigating Troubled Waters: A New Policy for the Atlantic Fisheries," submitted 57 recommendations on "how to achieve and maintain a viable Atlantic fishing industry, with due consideration for the overall economic and social development of the Atlantic provinces."[2]

What followed was a "restructuring" process involving the infusion of public money to refinance and amalgamate a number of firms which operated offshore fleets. Two new "super-companies" emerged, one based in Newfoundland and the other in Nova Scotia.[3] Although subsequent market strength allowed these companies to return to private hands, a number of witnesses who appeared before this Committee drew our attention to the fact that virtually nothing was done at the time to assist independent fishermen, processors and cooperatives. Also debated were the desirability of having two industry "giants" allocated over 80% of Canadian offshore groundfish quotas, and whether governments should in the future allow businesses to fail, a possibility resisted in the past because of the strong social implications.

The issues confronting the fishery are difficult to unravel and often defy simple generalizations. The industry is a system with many tiers; species of fish vary widely with respect to behaviour, abundance, distribution and market value. Because there is generally more catching capacity than the resource can support, the industry is subject to a broad range of regulatory controls, which are not always popular among fishermen. The length of fishing seasons varies not only by species, but also by area and from year to year. Fishermen hold different types of licences, fish from boats of different sizes, use different types of gear, belong to different organizations, and invest different amounts of time and money. Some make substantial incomes while others achieve only modest financial returns.

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[1] Task Force on Atlantic Fisheries, *Navigating Troubled Waters: A New Policy for the Atlantic Fisheries*, Supply and Services Canada, December 1982, p. 3.

[2] *Ibid.*

[3] Fishery Products International was formed from four bankrupt ground fish companies. National Sea Products also received public financial support during this time, in addition to support from the private sector.

The complexion of the industry changes notably from one area to the next across the five Atlantic provinces. Though job opportunities in the off-season are available in some regions, in others, fishermen and fish plant workers rely on unemployment insurance to supplement their incomes. The possibilities for conflict between provincial governments and fishing fleets are exacerbated because supply is influenced not only by government decisions on fish allocation and overall levels of exploitation, but also by uncontrollable natural phenomena such as fish migration and predator-prey relationships.

Processing is as diverse as the supply sector. Companies range from small independently-owned firms and cooperatives to large integrated ones. Some facilities act as collection stations which partly process the fish for delivery to larger plants. Because of the seasonal nature of some fisheries, many plants along the Atlantic coastline are idle for much of the year. The larger companies process a wide range of finished products, while most specialize in only a few items. Some processors, particularly the larger ones, have developed strong marketing expertise; others, however, are too small to afford sophisticated marketing programs and the qualified personnel to implement them.

The Kirby Report, possibly the most thorough analysis ever undertaken on the East Coast groundfish and herring fisheries, devoted much of its discussion to seafood marketing and sought to dispel a number of myths surrounding the subject. The evidence presented to our Committee, however, suggests that that report's recommendations, particularly those in the areas of product and market development, product quality and promotions, received far too little government and industry consideration. Seven years after the report's release, and despite many improvements, and some notable exceptions, it can be fairly stated that East Coast fish and seafood remains one of the most "under-marketed" protein foods produced in Canada.

Today, over 100 coastal states, both developed and developing, control 99% of the world's total marine fishery resource, in marked contrast to the situation just a decade ago when it was dominated by a handful of powerful maritime countries. The structure of the world fishery has undergone many changes as a number of nations have seized the opportunity to develop the marine resources off their shores. The result has been an increasingly competitive and at times unstable marketplace. It would also appear that the world's harvest of traditional wild stocks has reached its limit.

Given a strong and increasing demand for the oceans' resources and a growing world population, the fishing industry on the East Coast will need to stay ahead by adopting a more "market-driven" approach and by shifting away from its traditional "volume orientation." This, the Committee believes, is necessary if the full economic benefits and potential of the fishery are to be realized. Government has an important role to play in assisting the industry to achieve this objective, by injecting marketing considerations into fisheries management and policy. It must also be recognized that long-term stability in the industry can come about only with prudent fisheries management practices.

CHAPTER II

The Resource

Adequate supply and good resource management. That's where it starts.

Proceedings, 3 February 1988, p. 64

AN OVERVIEW

The East Coast of Canada unquestionably sits on one of the most productive fishery resources in the world. On the continental shelf, where the renowned Grand, Georges and other fishing banks are found, the warm waters of the Gulf Stream mix with the frigid Labrador Current, providing an ideal environment for the growth of plankton, a vital link in the marine food chain. The principal types of fish are groundfish, pelagics and shellfish, although mammals (e.g., whales and seals), marine plants (eg., Irish moss, dulse, rockweed and kelp) and other forms of marine life are also considered to be "fishery" resources.

Groundfish, so called because they generally feed and dwell near the bottom of the sea, make up more than half of the total catch. Although there are many species of groundfish, the major ones in terms of economic importance are Atlantic cod, small flatfish, haddock, pollock, turbot, redfish, hake and halibut.

Cod, the most important commercial species in the Northwest Atlantic, are found from shallow water (about 5 metres) to the edge of the continental shelf in water as deep as 600 metres. There are basically 12 stocks within Canadian waters, from Frobisher Bay in the north to Georges Bank in the south.[1] The fish migrate according to seasonal cycles triggered by spawning behaviour, food and temperature. In early summer, they typically move inshore where they feed heavily on capelin, herring and a host of other small fish and invertebrates. By the early winter months, the fish typically will have moved offshore where they will later spawn. Recaptures of tagged fish suggest a strong degree of homing activity. Females mature sexually at about six years; males

[1] Department of Fisheries and Oceans, "Underwater World: Atlantic Cod," Supply and Services Canada, 1984, p. 3.

at a slightly younger age. Although cod are very prolific, the mortality rate is tremendous: of the several million eggs each female lays, only one in a million lives to maturity.

Of the many flatfish species which are distributed from Baffin Island to the Canada-United States border, the most important are American plaice (five stocks), grey sole (four stocks), yellowtail (one stock), turbot (three stocks) and a flatfish stock which includes all species on the Scotian Shelf. Although small flatfish (e.g., American plaice, yellowtail, grey and winter sole) differ in size, appearance, distribution and abundance, their bodies are typically flat, both eyes are on the same side of the head, and their topside is pigmented as protection from predators. Whereas larger flatfish, such as halibut and turbot, have forked tails, the smaller fish have rounded ones.[1] (Further information on individual species of fish is given in Appendix 1.)

Other important species of groundfish include haddock (six stocks), distributed along the East Coast from the Grand Banks to Georges Bank, redfish (seven stocks) from the southern coast of Baffin Island to the Canada-United States border, and pollock (one stock), which is concentrated on the Scotian Shelf and Georges Bank.

Unlike groundfish, pelagic fish are generally very streamlined, range throughout the water column and feed in surface and middle-depth waters. For the most part, they swim in large schools and include such species as mackerel (two stocks, though most Canadian catches are taken from a northern population) and capelin (five stocks). Atlantic herring, however, is the most commercially important and best known of the East Coast pelagics.

There are 11 stocks of Atlantic herring, including ten within Canadian waters and one on Georges Bank, which is shared jointly with the United States.[2] One large stock spawns off Southwest Nova Scotia in the fall and later migrates up the Nova Scotia coast to winter. When this population moves to the Bay of Fundy in the spring to feed, juveniles from the group mix with those of the Gulf of Maine to form large concentrations of so-called "sardines." In the Southern Gulf of St. Lawrence, the Baie des Chaleurs is an important spawning site for two other biologically separate spring and fall spawning populations. Large bays around Newfoundland also support local less migratory stocks.[3] Although the fish, from the egg to adult stages, are the prey of a number of predators (e.g., cod, tuna, dogfish, squid, seabirds, seals and whales), fishing is believed to be the most important cause of mortality.[4] The herring's major food are tiny crustaceans and the eggs and larvae of other organisms.

Pelagic fish also include catadromous species (e.g., eels) which migrate from the sea to freshwater and back again for spawning, as well as anadromous fish (e.g., smelt and gaspereau) which migrate in the opposite direction, spawning in freshwater but

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[1] Department of Fisheries and Oceans, "Underwater World: Atlantic Groundfish," Supply and Services Canada, 1983, p. 3.

[2] Department of Fisheries and Oceans, "Underwater World: Atlantic Pelagic and Diadromous Fish," Supply and Service Canada, 1984, p. 2.

[3] Department of Fisheries and Oceans, "Underwater World: Atlantic Herring," Supply and Services Canada, 1984, p. 2.

[4] Foreign overfishing on Georges Bank during the 1960s eventually led to the collapse of the herring population in that area.

spending much of their lives in the ocean. The world renowned and highly valued Atlantic salmon, which ranges from Ungava Bay in Northern Quebec to a few rivers in New England[1] is the most highly valued and popular example of the latter.

Shellfish, some species of which are highly valued as seafood, are invertebrate aquatic animals, and may be classified into three groups: crustaceans, such as crabs, shrimp and lobster; molluscs, such as scallops, clams, mussels and oysters; and echinoderms, such as sea urchins and sea cucumbers.

RESOURCE MANAGEMENT

A. The 200-Mile Limit

For centuries, the fleets of England and Continental Europe have crossed the Atlantic to fish in the waters off the East Coast of Canada. Not until the mid 20th century did these countries realize that the resource was not inexhaustible, and recognize the need to maintain a scientific, surveillance and enforcement capability in the region.

The first attempt to bring some order to the offshore fishery came with the establishment of the International Commission for the Northwest Atlantic Fisheries (ICNAF) in 1949. Although ICNAF undertook scientific research and introduced regulations for fishing gear,[2] it was not until 1971 that quotas to individual member countries for certain stocks of fish were agreed upon. It soon became apparent, however, that regulatory controls and enforcement measures were not effective in curbing overexploitation by eastern and northwestern European factory freezer trawlers. Beginning in the 1950s and 1960s the fishery became less economically viable year by year.

The situation reached a low point in 1974, when severe resource declines, falling prices and rapidly escalating costs of catching and processing fish combined to threaten the survival of the Canadian industry. By 1976, overfishing of some stocks by both Canadian and foreign offshore trawlers became so serious that ICNAF agreed to establish a fishing zone exclusive to Canada before the resource became irreparably depleted. On 1 January 1977, following a series of lengthy international negotiations at the Law of the Sea Conferences, Canadian jurisdiction over coastal waters was extended to 200 nautical miles (370 kilometres) from the previous 12 miles, taking in most (but not all) of the best fishing grounds along the East Coast. On 31 December 1979, ICNAF was replaced by the Northwest Atlantic Fisheries Organization (NAFO) which became fully responsible for fishing activity beyond the 200-mile Canadian zone.

Although the 200-mile limit did not result in the bonanza that had initially been predicted, it did inaugurate a challenging new era for fisheries management by

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[1] On the coast of Europe, Atlantic salmon range from above the Arctic Circle to Portugal.

[2] Sally Lou Le Messurier, *The Fishery of Newfoundland and Labrador*, Memorial University, St. John's, 1980, p. 86.

affording Canadian control over the resource.[1] In conjunction with the extension, for example, the federal government introduced the first annual Groundfish Management Plan. Foreign fishing was progressively cut back, and considerable and increasing attention was devoted to the application of sophisticated scientific techniques for identifying optimum levels of exploitation. In fact, it may be said that government-sponsored research on fish stocks and the marine environment has given Canada an enviable world reputation for biologically sound resource management.[2] Stocks of many species that were previously overexploited have recovered.[3]

All stocks, however, are not improving, especially those in the areas of the Flemish Cap and the Grand Banks, which are outside or straddle the 200 mile limit. As well, only limited additional growth is now being predicted for most species, although the situation in Canada compares favourably with that faced by other fishing nations and coastal states.

B. Managing the East Coast Fishery

1. The Federal Mandate

Fish are generally regarded as a "common property" resource: they become the private property of a fisherman only once they are caught and removed from the water. This tends to result in a "free-for-all" race for limited stocks in an effort to maximize returns. High profits and earnings constitute a powerful spur for fishermen to invest in bigger and more expensive boats, better gear and more sophisticated equipment in anticipation of future catches; since all fishermen react in the same way, however, no one is farther ahead. Moreover, since the industry is based on a resource that belongs to all, there is little incentive to preserve it ("everybody's property is nobody's responsibility"). Overcapacity and low profitability also arise in fish processing because of the seasonal nature of some fisheries; plants are built to handle peak capacity, but often remain idle for much of the year.

The result is too many in the industry for the limited fish available. In poor fishing years or when markets soften, the consequence is severe economic and social distress for the communities involved. Stability is therefore normally maintained or restored through government imposition of regulatory measures.

In Canada, federal jurisdiction over "seacoast and inland" fisheries is established under section 91(12) of the *British North America Act, 1867* as incorporated in the *Constitution Act, 1982*. The mandate of the Minister and the Department of Fisheries and Oceans (DFO) is set out in the *Government Organization Act, 1979*. The *Fisheries Act*, the basic statute among the 17 separate statutes administered by the Department,[4] governs legislation over such matters as fish allocation, licensing, habitat

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 25, 4 February 1988, p. 118.

[2] *Ibid.*, Issue No. 29, 15 March 1988, p. 19.

[3] See Department of Fisheries and Oceans, *Resource Prospects for Canada's Atlantic Fisheries 1989-1993*, Supply and Services Canada, June 1988.

[4] Department of Fisheries and Oceans, brief presented to the Standing Senate Committee on Fisheries, 8 December 1987, p. 6.

management, arctic marine conservation, fisheries resource assess ment and aquaculture research. Statutory provisions are applied in day-to-day fisheries management through regulations which are periodically updated or amended.

Other important statutes include the *Coastal Fisheries Protection Act*, which empowers the government to monitor and control fishing activity within the 200-mile limit, and the *Fish Inspection Act*, which provides for the control of the quality of fishery products. Assistance programs and intervention in industrial and trade development fall under a group of statutes, such as the *Fisheries Development Act*, the *Fisheries Prices Support Act* and the *Canadian Salt Fish Act*. In the case of transboundary or straddling stocks outside Canada's zone, Canada is a signatory to various international conventions, such as the Northwest Atlantic Fisheries Organization (NAFO), the North Atlantic Salmon Conservation Organization (NASCO), the International North Pacific Fisheries Commission (INPFC), the International Convention for the Conservation of Atlantic Tunas (ICCAT), and the International Council for the Exploration of the Sea (ICES).

While other federal departments (e.g., the Departments of Energy, Mines and Resources, Indian Affairs and Northern Development, Transport, External Affairs) contribute to the management of Canada's water-based activities, DFO is the one whose primary focus is water and its resources. Since that Department has responsibility for all matters respecting oceans not by law assigned to any other department, it serves many distinct client groups: the ocean technology industry; the offshore petroleum industry; mariners and those who benefit from fishery resources, that is, all commercial, recreational and native fishermen, fish plant owners and workers, and consumers of fish products.

In broad terms, the basic objective of federal fisheries policy is "to provide for the conservation, development and sustained economic utilization of Canada's fisheries resources in marine and inland waters for those who derive their livelihood or benefit from these resources."[1] The extent to which federal responsibility is exercised is determined by judicial interpretation and specific agreements with the provinces. Over the years, certain aspects of the fisheries have been delegated to provincial governments for administration (e.g., management of the freshwater fisheries and the Atlantic salmon fishery in Quebec),[2] but the federal government has retained exclusive authority to approve and enact any amendments to fisheries legislation and regulations. Although federal-provincial responsibilities overlap somewhat as far as property and civil rights are concerned in non-tidal waters, the federal government has sole jurisdiction for the management of all Canadian fisheries.[3] Section 92 of the *Constitution Act* assigns exclusive provincial legislative authority over fish between the times they are landed and sold outside a province's boundaries. The provincial governments have an obvious interest in all aspects of the fishery because of the industry's impact on provincial employment and income.

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[1] Department of Fisheries and Oceans, *Annual Report: 1986-1987*, Supply and Services Canada, 1988, p. 2.

[2] Since 1984, the federal government has assumed the responsibility for managing the marine fishery in Quebec, except for anadromous and catadromous species of fish, for which administrative responsibility has been delegated to the province.

[3] Department of Fisheries and Oceans, brief, 8 December 1987, p. 5.

2. Major Resource Management Strategies

Given that many fisheries on the East Coast have sufficient or even excessive fishing capacity in relation to the available resource, a number of strategies have been devised to limit the fishing effort.

Generally speaking, the conditions of entry into a fishery and the total number of fishermen and vessels are determined through a mixture of licensing regulations such as fishermen's registration and categorization (e.g., full-time or part-time designations) and provisions on vessel registration and replacement. With few local exceptions, virtually all commercial species — all groundfish, shrimp, scallops, crab, lobster, salmon, herring, mackerel, tuna, and swordfish — are managed as "limited-entry" fisheries. The total number of fishermen is at present being held constant, and the only opportunity for new entrants is through the re-issuance of the licences of those leaving the fishery.[1]

Resource management on the East Coast is also subdivided into four regions (with headquarters located as indicated): the Gulf Region (Moncton, New Brunswick), the Newfoundland Region (St. John's, Newfoundland), the Scotia Fundy Region (Halifax, Nova Scotia) and the Quebec Region (Quebec City, Quebec). Each region is in turn organized into three streams of activity: fisheries and habitat management, science, and support services.[2] Inshore vessels are restricted to operating in the sector in accordance with the NAFO division system,[3] and each sector is managed as a self-contained entity (Chart 1). With respect to inshore boats (vessels less than 65 ft. in length overall (LOA)) that harvest groundfish, three management sectors are closely aligned with the Department's administrative regions: the Newfoundland Region (NAFO areas 0,2,3KLMNOPs), the Gulf and Quebec Region (4RST, 3Pn) and the Scotia-Fundy Region (4VWX, 5).[4] Management zones have also been established for other fisheries (e.g., salmon, lobster, crab and marine plants) within the Department's regional organization.

Except for lobster and Atlantic salmon, commercial stocks of fish are exploited on the basis of a Total Allowable Catch (TAC): the maximum allowable volume of a given stock which may be harvested during a specified fishing season.[5] Assessing the abundance and status of fish populations is a lengthy, complex annual process.[6] Although there are different methods by which TACs can be determined, the reference

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(1) *Ibid.*, p. 10. Federal licensing policies were consolidated in January 1989. See Department of Fisheries and Oceans, *Commercial Fisheries Licensing Policy for Eastern Canada*, January 1989. If a fishery is new, developing or underutilized, exploratory licences may be authorized by the Minister of Fisheries and Oceans for a specified time period. Exploratory licence holders are given priority for permanent licences. Where there are more applications than available licences, a public draw system is used.

(2) Department of Fisheries and Oceans, *Annual Report: 1986-1987*, p. 6.

(3) NAFO divides the waters off the Atlantic coast into different sectors. For example, the southern area of the Grand Bank includes NAFO divisions 3N and 3O, or simply 3NO. Fisheries statistics are usually gathered on the basis of these areas.

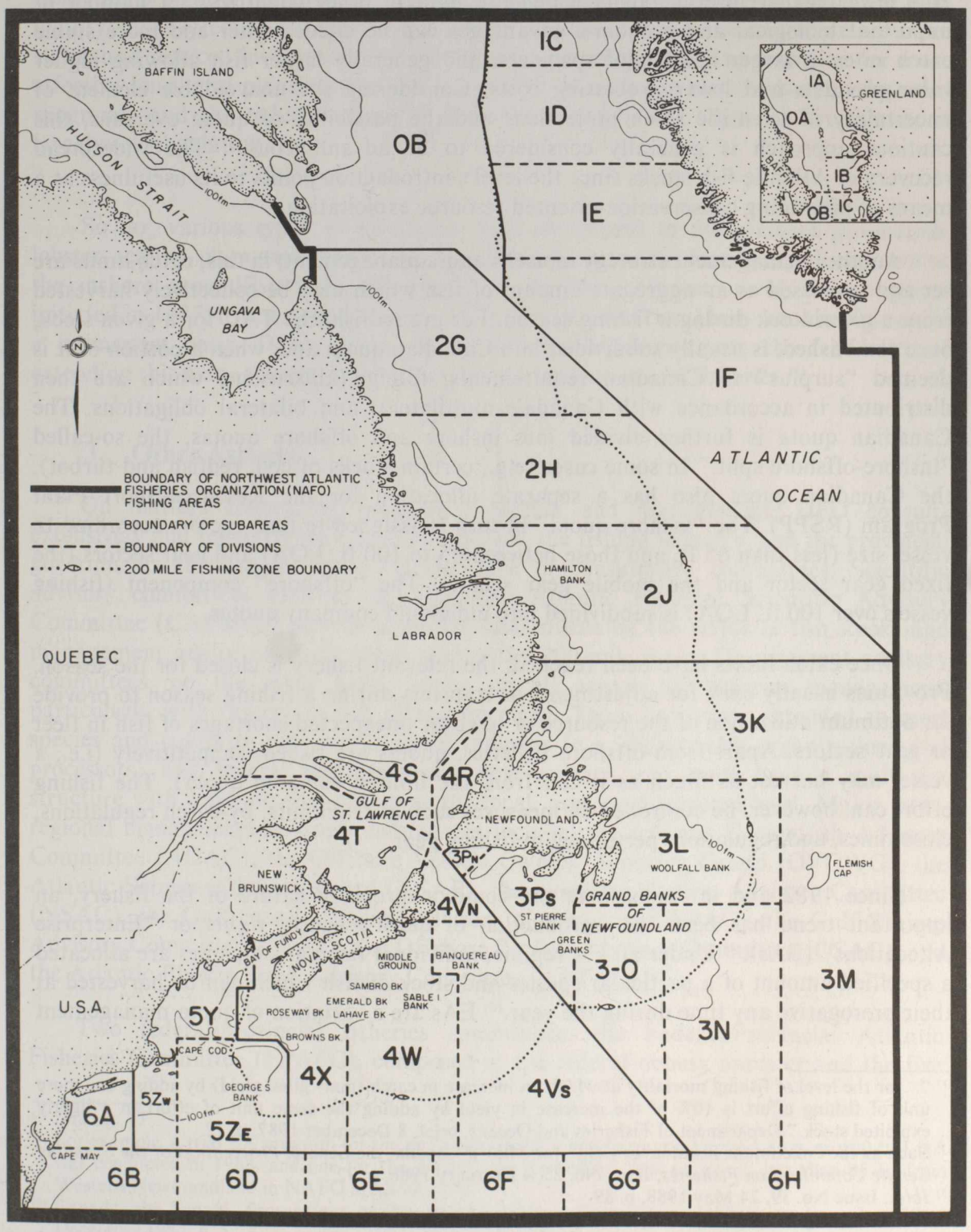
(4) Department of Fisheries and Oceans, brief, 8 December 1987, p. 11. The Quebec Region jointly manages some Gulf of St. Lawrence fisheries with the Gulf Region.

(5) For salmon, an optimum necessary "escapement" is established; for lobster, a minimum size.

(6) Department of Fisheries and Oceans, "The Science of Cod," *Fo'c'sle*, Special Science Edition, Vol. 8, No. 2, February 1988, p. 5.

Chart 1

Subareas and Divisions of the NAFO Convention Area



Source: Department of Fisheries and Oceans.

point since 1977 for the most important species on the East Coast has been FO.1 or the level of fishing effort beyond which catch rates start declining rapidly.[1]

Although fishing at the FO.1 level leads to a potential catch which is about 10 to 20% lower than reference points which are used in other countries,[2] a number of important biological and economic advantages can be cited: higher and more stable catch rates, a larger number of spawners, and generally larger fish allowing higher value products and lower processing costs. Considering the unavoidable element of uncertainty in scientific stock projections and the possibility of quota overruns, this cautious approach is generally considered to be advantageous.[3] The widespread recovery of Atlantic fish stocks since the level's introduction points to its usefulness as a means of promoting conservation-oriented resource exploitation.

Another management strategy in use is quota management; in this, catch limits are set and expressed as an aggregate amount of fish which may be collectively harvested from a given stock during a fishing season. For groundfish, the TAC for a given stock, once established, is usually subdivided into Canadian quota and, when a portion of it is deemed "surplus" to Canadian requirements, foreign allocations, which are then distributed in accordance with Canada's multilateral and bilateral obligations. The Canadian quota is further divided into inshore and offshore quotas, the so-called "inshore-offshore split." In some cases (e.g., certain stocks of cod, redfish and turbot), the Canadian quota also has a separate allocation for the Resource-Short Plant Program (RSPP). The "inshore quota" in turn is assigned to fleet sectors according to vessel size (less than 65 ft. and those between 65 to 100 ft. LOA) and gear sectors (the fixed gear sector and the mobile gear sector). The "offshore" component (fishing vessels over 100 ft. LOA) is subdivided into individual company quotas.

Once catch limits have been reached, the relevant fishery is closed for the season. Provisions usually exist for adjustments or transfers during a fishing season to provide for optimum utilization of the resource or to cover unexpected shortages of fish in fleet or gear sectors. Apart from offshore fisheries, quotas are fished competitively (i.e., a vessel may harvest as much as it can from the limited common quota). The fishing effort can, however, be controlled by measures such as trip limits, by-catch regulations, close times, and regulations pertaining to fishing gear.

Since 1982 and in response to the common property nature of the fishery, an important trend has been the introduction of quasi-property rights or "Enterprise Allocations" (EAs).[4] Under an EA regime, individual fishing companies are allocated a specified amount of a particular species and stock of fish which can be harvested at their prerogative any time during the year.[5] EAs are a variation of quota management

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(1) ". . .or the level of fishing mortality at which an increase in catch (mar- ginal yield) by adding one more unit of fishing effort is 10% of the increase in yield by adding the same unit of effort in a lightly exploited stock." Department of Fisheries and Oceans, brief, 8 December 1987, p. 12.

(2) Such as the "maximum sustainable yield" (or MSY). Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 25, 4 February 1988, p. 92.

(3) *Ibid.*, Issue No. 39, 24 May 1988, p. 89.

(4) The offshore groundfish EA Program was introduced in 1982 for the four largest trawler companies at that time. Smaller offshore companies, the so-called "Independent Offshore Group" (IOG), continued to fish competitively from a pool of offshore allocations set aside for them.

(5) Department of Fisheries and Oceans, brief, 8 December 1987, p. 14.

and are commonly expressed as an absolute amount or tonnage of fish, but are determined on the basis of fixed percentage shares of a stock. Among the most often cited economic advantages accruing to industry under an EA regime are: the elimination of the "race to the fish" which leads to market glutting and overcapitalization; the promotion of greater "market responsiveness" in terms of better product quality; more effective coordination of supply with market demand and therefore more stable and reduced inventories and corresponding storage costs; the provision for more effective long-term planning in terms of capital investments and market development programs; and the reduced need for government regulation since an EA scheme is largely self-regulating.[1]

So far, various types of EAs have been introduced in the offshore groundfish, lobster, scallop, clam and northern shrimp fisheries, as well as in a localized segment of the inshore groundfish fishery.[2] Following an 18-month review of EA programs initiated in 1987, it was announced on 30 December 1988 that these would continue on a permanent basis. DFO is also in the process of determining the feasibility of extending this management approach to other fleet sectors and fisheries.[3]

3. Other Aspects

On matters concerning resource allocation and management, DFO consults extensively and regularly with scientific bodies, the fishing industry, and the provincial governments through an elaborate structure of consultative committees. Scientific advisory committees such as the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC) provide scientific assessments on the status of fish stocks and management advice on catch levels within the 200-mile limit. Management advisory committees, on the other hand, advise on all aspects of fisheries management, particularly with respect to fish allocation plans. These have been extended to most species and comprise representatives of industry (e.g., fishermen's organizations and processors) and federal and provincial governments, and most have a multi-tier structure with separate committees at the local, area, and regional level. Major inter-regional management advisory committees include: the Atlantic Groundfish Advisory Committee (AGAC), the Offshore Vessels Owners' Working Group (OVOWG), the Atlantic Salmon Advisory Board (ASAB), the Northern Shrimp Advisory Committee (NSAC), the Gulf Small Pelagics Advisory Committee (GSPAC), the Gulf Shrimp Advisory Committee (GSAC), the Offshore Scallop Advisory Committee (OSAC), and the Atlantic Bluefin Tuna Advisory Committee (ABTAC).[4]

Two federal-provincial fisheries committees, the Federal-Provincial Atlantic Fisheries Committee (FPAFC), composed of the federal deputy minister and the five

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[1] *Ibid.*, p. 17

[2] For example, a trial EA program for the mid-shore (mobile and fixed gear) vessels 65 ft. to 100 ft. LOA was conducted in 1988, and one for the mobile gear groundfish fleet of vessels less than 65 ft. from Western Newfoundland in NAFO areas 4R, 3Pn.

[3] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 22, 8 December 1987, p. 5.

[4] Department of Fisheries and Oceans, brief, 8 December 1987, p. 19. In total, there are more than 100 species advisory committees.

provincial fisheries deputy ministers, and the Atlantic Council of Fisheries Ministers (ACFM), made up of federal and provincial fisheries ministers, also deal with all major issues on the East Coast. In addition, an Atlantic Regional Council (ARC) was created in 1985 to provide the Minister with a forum to discuss important policy issues with a wide cross section of the industry.[1] The Minister of Fisheries and Oceans, however, has final authority over catch and quota decisions.

The process of developing management plans for the various fisheries takes place over a number of months preceding the relevant season. The plans serve as blueprints for fishing activity and indicate to all parties — fisheries managers, fishermen, processors, investors, politicians, communities and others — how much fish may be harvested, by whom, and under what conditions. DFO accords resource conservation the first priority, followed by the principle of "equity of allocations," which takes into account such factors as adjacency to the resource and the degree of dependency of different fleet sectors and fishing communities. A third major objective, though often implied rather than stated explicitly, is to distribute the benefits derived from the resource to the largest number of people possible, and over the entire fishing season.

Catches are monitored to avoid quota overruns. The methods employed for collecting data on offshore landings include daily hail reports, landings and allocation reports, log records, purchase slips by individual fishing boats and reports from on-board observers and visual information from surveillance patrols by sea and air. For inshore vessels, log records and purchase slips are used. A weekly "Atlantic Fisheries Quota and Allocations Report" lists the quota, the cumulative catch and the closure date for the various species, areas, fleets, and vessel categories.[2]

[1] In March 1988, council membership was expanded from 18 to 22.
[2] Department of Fisheries and Oceans, brief, 8 December 1987, p. 26.

CHAPTER III

Industry Profile

THE HARVESTING SECTOR

A. The Common Property Commercial Fishery

1. Overview

> Somehow we still can't get it into their heads that when the industry runs into problems, the region's entire economy suffers . . . Try in your report to make them understand that fish is just as important here as wheat in the West, as important as oil, as important as manufacturing in Quebec and Ontario.
>
> *Proceedings*, 16 June 1988, p. 67

Commercial fishing in Newfoundland, the Maritimes and the coastal areas of Quebec is the lifeblood of more than 1,300 small communities, about half of which are single sector economies.[1] From a national perspective the industry is of minor importance in terms of employment and income, contributing less than 0.5% of the Gross Domestic Product (GDP) but the situation is considerably different from an Atlantic region perspective, since together fish harvesting and processing account for about 100,000 jobs. In Newfoundland, the dependence of communities on the industry is even greater than the statistics would indicate; in that province about 20% of the work force is in fishing and processing, either seasonally or permanently. The Committee also recognizes that the industry in Quebec, although a small part of the total provincial economy, is an important activity in the Gaspé and north shore regions.

In 1988, some 38,300 Atlantic households (representing close to 140,000 people) had at least one active commercial fisherman. About 12,000 family members, as well as 3,260 active fishermen, also worked in fish processing jobs, demonstrating the added dependence of some families on the fishery's secondary sector. Newfoundland had the

[1] The exact number of communities dependent on commercial fishing is not known because no agreed-upon definition of a "fishing community" exists. See Task Force on Atlantic Fisheries (1982), p. 70.

highest number of active fishermen and plant workers, Prince Edward Island the highest percentage of fishermen as household members, and New Brunswick the highest percentage of family members who worked in fish processing plants.[1] Worthy of note is that many participate in the fishery because of culture or family tradition, and are strongly attached to their identity as fishermen.

The industry has strong links with suppliers of goods and services. Employment in related industries is mostly in vessel design and construction. Supplies purchased by fishermen include fuel, nets and rope, navigation equipment, and other types of gear. The economic spinoffs of fish processing extend to people who manufacture cardboard boxes, plastic bags, etc., or who transport fish products to domestic and foreign markets, and the effect of economic changes in the industry is transmitted and multiplied throughout the general economy. In Nova Scotia, for example, it was estimated that every 1,000 tonnes of landed groundfish create 30 year-round direct processing jobs, which leads to 1.9 indirect jobs for every direct job created.[2]

Of a total of 54,153 personal commercial fishing licences issued by the federal government in the five Atlantic provinces in 1988, Newfoundland had the largest number or 48%, followed by Nova Scotia with 24%. Quebec, New Brunswick and Prince Edward Island respectively accounted for 8%, 11% and 9% of licences issued (Table 1). Not all licences are actually used in a particular season and many fishermen may hold licences for more than one species. For example, the lobster harvesting season is short, and many turn to other species when seasons are closed.[3] Approximately three-quarters of licensees actually participate in the fishery: 63% are classified as full-time and 37% part-time.[4] About 45% of Atlantic fishermen were under the age of 35, 26% were between 35 and 44, and 29% were over 45 in 1988. The highest percentage (49%) of active fishermen aged 65 and over was found along the eastern shore of Nova Scotia.[5]

Many factors affect the levels and stability of income within fisheries and among the different coastal regions. Offshore and inshore fishermen in southwestern Nova Scotia, for example, are often better off than those in the higher reaches of the Bay of Fundy because of their proximity to markets, the availability of alternative species, and ice-free ports which permit year-round fishing.[6] The length of fishing seasons is not only influenced by climatic conditions, weather patterns, relative resource abundance and diversity, but also by fish migratory patterns, and by decisions on quotas and other measures to prevent stock depletion. Fishermen are also witness to the vagaries of luck. As one researcher with the Dalhousie Ocean Studies Programme notes:

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[1] Department of Fisheries and Oceans, *1988 Survey of Atlantic Fishermen*, Economic and Commercial Analysis Directorate, preliminary results.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 36, 13 May 1988, p. 9.

[3] *Ibid.*, Issue No. 28, 1 March 1988, p. 6.

[4] DFO began classifying Atlantic commercial fishing licences as full-time or part-time in 1981 to distinguish between those who relied primarily on fishing for their livelihood and those who fished to supplement other income. Bonafide and commercial categories also apply in certain areas.

[5] Department of Fisheries and Oceans, *1988 Survey of Atlantic Fishermen*, preliminary results.

[6] R.D.S. Macdonald, "Canadian Fisheries Policy and the Development of Atlantic Coast Groundfisheries Management," in *Atlantic Fisheries and Coastal Communities: Fisheries Decision-Making Case Studies*, C. Lamson and A.J. Hanson, editors, Dalhousie Ocean Studies Programme, Halifax, 1984, p. 21.

TABLE 1

NUMBER OF LICENCES ISSUED BY TYPE, PROVINCE AND DFO REGION, 1988

Province	Region	A	C	E	F	G	J	L	O	P	R	S	T	Total
N.S.	Scotia-Fundy	2,602	1,935	1,564	1,042	29	0	0	351	60	2,709	8	107	10,407
	Gulf	379	431	396	109	135	0	0	133	179	696	0	87	2,545
N.B.	Scotia-Fundy	243	365	17	7	0	0	0	230	1	299	16	0	1,178
	Gulf	778	1,230	1,065	0	117	0	2	248	3	1,380	22	81	4,926
P.E.I.	Gulf	931	866	823	0	361	0	0	401	63	1,308	0	16	4,769
Que.	Quebec	1,568	1,361	456	0	53	0	25	73	0	647	56	177	4,416
Nfld.	Nfld.	7,521	2,704	752	4	12	2,753	2,434	412	105	3,196	8	626	20,527
	Gulf	2,251	768	68	2	0	379	349	196	0	1,312	54	6	5,385
TOTAL		16,273	9,660	5,141	1,164	707	3,132	2,810	2,044	411	11,547	164	1,100	54,153

Codes	Species	Codes	Species
A	Groundfish	L	Capelin
C	Herring	O	Scallop
E	Mackerel	P	Squid
F	Swordfish	R	Lobster
G	Tuna	S	Shrimp
J	Salmon	T	Crab

Source: Department of Fisheries and Oceans, Economic Analysis and Statistics Division, 1 November 1989.

> Fishing requires an ability to wait, sometimes endlessly, for changes. This characteristic has a profound influence on fishing behaviour and is central to understanding the ethos of fishermen and fishing communities. Such traits as passivity and skepticism have been misconstrued by non-fishermen as indicative of conservatism or lack of entrepreneurial drive, when in essence these traits are examples of adaptive strategies which have enabled fishermen to cope with the myriad of uncertainties associated with their often hazardous and unpredictable occupation.[1]

Some fishermen exploit each season more fully than others. On average, all East Coast fishermen fished for about 19 weeks in 1988, and devoted almost 7 weeks to prepare for the season.[2] All fishermen spent on average 4 weeks in other income-earning employment, almost 18 weeks collecting Unemployment Insurance (UI) benefits, and the remaining weeks at other activities.

[1] Lamson (1984), p. 106.

[2] In terms of overall participation, the longest periods of fishing activity were in Nova Scotia (23.4 weeks), followed by Newfoundland (19.2 weeks), P.E.I. (16.0 weeks), Quebec (15.4 weeks), and New Brunswick (14.9 weeks). The average number of weeks spent fishing among full-time fishermen was highest in southwest Nova Scotia at 30.3 weeks, followed closely by southern Newfoundland at 29.2 weeks. The shortest period for full-time fishermen was northeast New Brunswick at 15.6 weeks. Department of Fisheries and Oceans, *1988 Survey of Atlantic Fishermen*, preliminary results.

Few people would dispute the wealth of the resource, yet the fishery does not always provide a good living. Fishing revenues, expenses and incomes vary widely across different areas of each province, and between full-time and part-time fishermen. In 1988, full-timers are estimated to have earned an average net fishing income of $15,653, compared to $5,642 for part-time fishermen. Full-timers in Nova Scotia had the highest net fishing incomes, averaging $23,615, while those in Newfoundland had the lowest with $9,686. On a regional basis, however, western Newfoundland full-time fishermen had the lowest average net fishing incomes or $6,900, a figure only 20% higher than the average income of part-timers on the East Coast.

Many fishermen rely on other sources of employment, such as fish processing, construction and forestry. An average full-time fisherman earned $830 from non-fishing employment in 1988, representing 4% of his total income. A part-timer, on the other hand, averaged nearly six times more at $5,070 or 31%. The availability of alternative employment, however, varies from region to region and there is a continuing need for government transfer payments such as family allowance, social assistance and UI, the most important supplement. The average income from all sources of a full-time East Coast fisherman in 1988 was approximately $22,900; $15,700 of this was derived from fishing and $5,900 from UI. For part-time fishermen, who collectively averaged $16,100 that year, about 34% was fisheries-related and 29% was in the form of UI benefits. Total UI payments represented as much as 40% of the total income of part-time fishermen in P.E.I. and 36% of that of full-timers in Newfoundland.

In the past, the extension of UI benefits to self-employed fishermen and crewmen has been criticized on the grounds that it promotes excess labour and deters the movement of marginal fishermen to other occupations. The fact, however, remains that unless another income security program is devised, such as a guaranteed annual supplement, UI benefits will continue to provide the most essential cashflows during the winter months when alternative employment opportunities are difficult to find. Although the issues surrounding UI are outside the Committee's terms of reference, the Committee notes that the Kirby Task Force proposed a scheme that would replace UI for fishermen with a production-bonus program consisting of cash credits paid in the off-season and determined by criteria such as gross value of landings, fish quality and fishing gear used. An income stabilization plan based on a rolling five-year period and funded by the federal government and the participants in the program was also suggested,[1] but not implemented.

Fishermen on the East Coast are generally organized into associations based on a particular fishery, gear type or other special interest; many of these are linked by umbrella federations. Unlike unions, which negotiate with buyers over fish prices, associations tend to represent members on matters of government regulation.[2]

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[1] Task Force on Atlantic Fisheries (1982), p. 316.

[2] There are also fishermen's cooperatives, which embrace processing and marketing as well as fish harvesting.

There were some 30,409 registered fishing boats on the Atlantic coast in 1988, ranging in size from dories with small outboard motors to a large factory freezer ship (Table 2). For the most part, the inshore fleet comprises small craft (vessels less than 100 ft. LOA), owned largely by individuals. Although many inshore fishermen stay within a day's voyage of home port, larger inshore vessels in the so-called middle distance or mid-shore fleet (65 to 100 ft. LOA) may venture farther away and remain at sea for several days.[1] By and large, the inshore fishery catches many different species, and accounted for approximately half of total groundfish landings in 1987.[2]

The offshore fleet consisted of some 217 fishing vessels (greater than 100 ft. LOA), owned primarily by a few large processors. This sector, which represents about half of total investment in the East Coast fleets, concentrates on catching groundfish, operates year-round and is largely centred on frozen production. Much of the offshore fishing effort is based in Nova Scotia and Newfoundland.

The distinction between fishing sectors, however, is perhaps an oversimplification since because of technological advances, vessels of all sizes, except the smallest, can fish the same grounds.[3] It nonetheless provides a useful shorthand to distinguish between seasonal and year-round operations and between capital-intensive and labour-intensive fishing operations. Apart from vessel size, many different types of gear are used to harvest fish, including fixed devices such as traps, weirs, gillnets, longlines, and mobile devices such as seines and trawls.

TABLE 2

NUMBER OF VESSELS BY LENGTH (IN FEET) BY PROVINCE AND DFO REGION, 1988

Province	Region	<35′	35′-30′11″	40′-44′11″	45′-49′11″	50′-54′11″	55′-59′11″	60′-64′11″	65′-99′11″	100′+	Total
N.S.	Scotia-Fundy	3,148	1,062	835	29	23	40	123	41	106	5,407
	Gulf	358	242	265	3	6	3	4	0	0	881
N.B.	Scotia-Fundy	377	134	178	12	6	20	28	12	2	769
	Gulf	583	258	971	29	7	6	76	27	9	1,966
P.E.I.	Gulf	2	356	1,049	27	2	0	0	4	1	1,471
Que.	Quebec	2,203	238	148	61	7	91	67	17	15	2,847
Nfld.	Nfld.	12,537	481	125	132	117	50	45	7	82	13,576
	Gulf	3,291	0	56	38	45	37	30	3	3	3,573
TOTAL		22,499	2,841	3,577	331	213	247	373	111	217	30,409

Source: Department of Fisheries and Oceans, Economic Analysis and Statistics Division, 1 November 1989.

(1) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 22, 8 December 1987, p. 19.

(2) See Department of Fisheries and Oceans, *Allocations and Landings for the Inshore and Offshore Groundfish Fleets 1978-1988*, 6 April 1988.

(3) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 22, 8 December 1987, p. 19.

2. Landings

In 1988, over 1.27 million tonnes of marine fish were landed at Atlantic ports. The value of this catch to fishermen was approximately $980 million, down 10% from 1987, reflecting generally lower landed prices in some major fisheries (Table 3). Groundfish and herring constituted about three-quarters of the quantity landed, and about half of the region's total value. This explains why much of the testimony submitted to the Committee concerned these two fisheries and why the Kirby Report focused on them as well.

The composition of catches varies over time because of environmental, biological and market-related factors. In recent years, substantial increases in price for some species compensated for lower landings. The five most important species overall in 1988 were cod (26.0% of total landed value), lobster (25.3%), crab (10.1%), scallop (8.8%) and shrimp (5.9%).

Groundfish accounted for 57.0% of total landings on the East Coast (by weight) in 1988 and 39.6% in value. Cod, which has traditionally been the most valuable species, continued to be so (65.8% of the value for groundfish), followed by small flatfish (10.3%), haddock (7.2%), redfish (6.1%) and pollock (3.5%). Because shellfish are highly valued by consumers, the catch represented 14.8% of the total harvested (by weight), but made up half (51.0%) the value. It consisted largely of lobster (49.6% of the total value of shellfish landings), followed by crab (19.8%), scallops (17.2%) and shrimp (11.6%). Pelagics accounted for 28.2% of the amount of the harvest, but only about 9.2% in dollar terms. Major species of pelagic fish were herring (43.7% of the total value for this group) and capelin (31.3%).

The fisheries of Newfoundland and Nova Scotia dominate the industry; together in 1988 they comprised 72.6% of the value of the total Atlantic harvest and 79.6% of the quantity (Tables 4 and 5). Nova Scotia had the most diversified and lucrative fishery in the region. Besides catching 34.7% of all groundfish on the East Coast, Nova Scotia fishermen had access to more valuable species such as lobster and scallops. Groundfish was the most important species group in Newfoundland (53.6% of total Atlantic groundfish landings). Although herring accounted for most of New Brunswick's harvest by weight, the most valuable species was lobster, followed by crab and herring. In terms of value, crab was the major species harvested in Quebec, and lobster in Prince Edward Island.

B. Aquaculture

> Man originally hunted and fished for food. Eventually, he began to raise livestock because land animals had become less accessible. . . Man domesticated animals to use for food, but [since] fish remained plentiful. . . no one bothered to domesticate and farm [them].
>
> *Proceedings*, 3 February 1988, p. 18

Aquaculture — the culture or husbandry of finfish, shellfish and aquatic plants — has emerged as a bright light in the development of the seafood industry. This segment of the fishing industry, which has perhaps the greatest potential for growth, could significantly increase the supply of seafood in the future. A number of witnesses hoped that future developments would broaden the economic base of coastal communities and generate additional technological expertise. An assessment of employment generated by

TABLE 3

EAST COAST LANDINGS, 1986-1988[1]

Species	1986 Catch (Tonnes)	1986 Value ($'000)	1987 Catch (Tonnes)	1987 Value ($'000)	1988 Catch (Tonnes)	1988 Value ($'000)
Groundfish						
Cod	474,720	215,480	451,675	328,410	466,397	255,158
Haddock	44,720	37,160	26,525	32,731	30,818	28,052
Redfish	79,670	23,570	80,010	25,767	73,548	23,656
Halibut	3,700	15,230	2,333	10,712	2,508	10,591
Small Flatfish	89,300	37,710	82,843	41,907	77,363	40,005
Turbot	18,070	9,780	30,486	26,743	16,073	9,247
Pollock	49,680	18,020	48,627	25,960	42,005	13,488
Hake	16,900	6,900	18,842	13,497	12,534	4,275
Cusk	2,110	1,240	3,944	3,516	2,874	1,429
Catfish	3,600	890	2,928	927	2,210	609
Other	3,490	2,180	3,959	5,206	2,043	1,475
TOTAL	785,960	368,160	752,172	515,376	728,373	387,985
Pelagic						
Herring	186,730	34,160	235,848	45,090	242,338	39,189
Mackerel	28,460	5,760	18,407	4,332	22,738	6,110
Tuna	90	680	34	241	419	3,861
Alewife	5,630	1,330	1,087	434	5,562	762
Eel	890	2,770	60	183	386	1,192
Salmon	1,320	5,340	1,331	5,148	981	4,120
Skate	170	10	562	70	233	32
Smelt	2,420	2,910	748	566	1,208	1,062
Capelin	66,490	20,370	29,470	6,995	85,466	28,072
Other	1,600	7,870	1,672	7,559	1,195	5,289
TOTAL	293,800	81,200	289,220	70,618	360,526	89,689
Shellfish						
Clams	8,150	9,690	4,256	5,316	6,267	6,157
Oyster	2,350	3,280	39	45	255	448
Scallop	57,000	74,300	72,444	112,500	78,517	85,934
Squid	70	40	211	62	312	91
Lobster	38,030	242,690	35,426	264,321	38,528	247,727
Shrimp	14,660	24,730	24,539	43,398	31,072	57,723
Queen Crab	42,830	67,480	26,842	77,472	29,519	98,474
Other Crabs	..	..	110	92	1,604	622
Other	2,430	2,900	2,275	1,939	2,344	2,254
TOTAL	165,520	425,110	166,142	505,145	188,418	499,430
Miscellaneous	—	4,010	...	1,610	...	2,493
GRAND TOTAL	1,245,280	878,480	1,207,534	1,092,749	1,277,317	979,597

[1] Preliminary figures. Nominal catches in round weights.
.. Not available.
... Not applicable because of different units of measurement.

Sources: Department of Fisheries and Oceans, *Canadian Fisheries Landings*, Vol. 10, No. 12, December 1988; *Canadian Fisheries Statistical Highlights 1987*, 1989.

TABLE 4

PROVINCIAL CATCHES BY SPECIES AND LANDED WEIGHT (IN TONNES), 1988[1]

Species	Nfld.	N.S.	N.B.	Quebec	P.E.I.
Groundfish					
Cod	298,960	126,627	9,971	26,575	4,264
Haddock	5,674	25,040	73	31	—
Redfish	17,329	31,973	4,436	16,902	2,908
Halibut	249	2,068	13	175	3
Small Flatfish	54,472	14,220	2,770	4,114	1,787
Turbot	8,767	80	221	7,005	—
Pollock	3,409	37,357	1,237	—	2
Hake	528	9,582	392	379	1,653
Cusk	—	2,872	2	—	—
Catfish	1,025	1,133	12	40	—
Other	32	1,809	18	151	33
TOTAL	390,445	252,761	19,145	55,372	10,650
Pelagic					
Herring	24,848	119,556	83,110	5,044	9,780
Mackerel	5,899	6,434	4,131	3,663	2,611
Tuna	153	222	—	—	44
Alewife	—	1,574	3,756	—	232
Eel	57	35	176	6	112
Salmon	947	—	—	34	—
Skate	112	121	—	—	—
Smelt	57	98	793	48	212
Capelin	85,306	—	—	160	—
Other	140	759	203	13	80
TOTAL	117,519	128,799	92,169	8,968	13,071
Shellfish					
Clams	—	3,777	1,402	613	475
Oyster	—	60	140	—	55
Scallop	2,260	67,898	4,209	3,366	784
Squid	285	27	—	—	—
Lobster	2,502	17,008	6,940	2,532	9,546
Shrimp	18,096	2,546	2,188	8,242	—
Queen Crab	9,799	2,810	7,392	8,820	698
Other Crabs	—	242	496	—	866
Other	45	127	126	1,237	809
TOTAL	32,987	94,495	22,893	24,810	13,233
GRAND TOTAL	540,951	476,055	134,207	89,150	36,954

[1] Preliminary figures. Nominal catches in round weights.
— Nil or zero.

Source: Department of Fisheries and Oceans, *Canadian Fisheries Landings*, Vol. 10, No. 12, December 1988.

TABLE 5

PROVINCIAL CATCHES BY SPECIES AND VALUE (IN $'000), 1988[1]

Species	N.S.	Nfld.	N.B.	Quebec	P.E.I.
Groundfish					
Cod	80,523	153,887	4,467	14,611	1,670
Haddock	25,704	2,230	96	22	—
Redfish	11,451	6,152	1,480	3,887	686
Halibut	9,455	583	58	485	10
Small Flatfish	13,402	20,854	1,765	2,796	1,188
Turbot	31	3,969	129	5,118	—
Pollock	12,228	724	536	—	0
Hake	3,580	79	140	90	386
Cusk	1,428	—	1	—	—
Catfish	374	221	3	11	—
Other	1,382	6	10	68	9
TOTAL	159,558	188,705	8,685	27,088	3,949
Pelagic					
Herring	19,981	3,124	13,072	1,293	1,719
Mackerel	2,242	856	1,205	1,030	777
Tuna	2,721	741	—	—	399
Alewife	294	—	400	—	68
Eel	119	204	532	25	312
Salmon	—	3,938	—	182	—
Skate	17	15	—	—	—
Smelt	141	38	670	45	168
Capelin	—	28,021	—	51	—
Other	4,460	675	117	14	23
TOTAL	29,975	37,612	15,996	2,640	3,466
Shellfish					
Clams	3,604	—	1,496	619	438
Oyster	86	—	278	—	84
Scallop	74,051	2,489	5,069	3,412	913
Squid	10	81	—	—	—
Lobster	127,277	14,206	41,259	16,063	48,922
Shrimp	8,198	31,898	3,484	14,143	—
Queen Crab	9,121	22,183	31,780	33,048	2,342
Other Crabs	64	—	167	—	391
Other	335	40	131	537	1,191
TOTAL	222,766	70,897	83,664	67,822	54,281
Miscellaneous	1,478	641	310	60	4
GRAND TOTAL	413,777	297,855	108,655	97,610	61,700

[1] Preliminary figures.
— Nil or zero.

Source: Department of Fisheries and Oceans, *Canadian Fisheries Landings*, Vol. 10, No. 12, December 1988.

the sector on the East Coast was recently undertaken; direct employment is estimated to have amounted to 430 full-time jobs in 1988.[1] Significant indirect benefits have also been created in related industries, such as equipment manufacturing, feed production, processing and transportation, marketing and consulting services.

Unlike the common property fishery (i.e., the traditional fishery), both the federal and provincial governments share jurisdiction over aquaculture. Under the Constitution, the federal government has jurisdiction over "sea coast and inland fisheries," but the responsibilities of the provinces for "property and civil rights" are significant. Because of this, the availability of data and the level of statistical detail varies by province, making it difficult to present directly comparable pictures of this industry in each region.

Federal responsibility lies chiefly with DFO, which undertakes a broad range of programs, some directly aimed at assisting development, such as conducting research and experimental development and providing disease diagnostic services, while others, such as the National Fish Inspection Program, support the entire fishing industry. A number of programs are also administered by other federal departments and are accessible to aquaculturists.[2] Although the provinces direct their efforts to addressing local conditions, the level of provincial involvement varies with each province. Financial assistance may be available through provincial programs; some provinces have relied on Subsidiary Agreements under federal-provincial Economic and Regional Development Agreements (ERDAs). In some cases, programs are specifically targeted at aquaculture.[3]

The federal government and all five Atlantic provincial governments have signed Memoranda of Understanding (MOUs), a concept endorsed by the first ministers at their November 1986 meeting in Vancouver, that clarify federal and provincial responsibilities in such areas as research and development, education, training, fish health and data collection.[4] A key aspect of MOUs is the establishment of "one-stop" licensing and leasing of commercial aquaculture ventures in each province.

Salmon farming, a relatively recent development on the East Coast, is very much a success story.[5] New Brunswick, which produced 3,000 tonnes of farmed Atlantic salmon, worth over $36 million, in 1988, is by far the largest producer (Figure 1), with production figures surpassing all expectations and previous estimates.[6] There were 34 salmon farms operating in that province in 1988, two of which were large, integrated operations (Connors Brothers Limited and Sea Farm Canada, a joint venture between Canada Packers and a Norwegian company). Because of ice conditions in the

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[1] Price Waterhouse Management Consultants (Prepared for DFO), *Long-Term Production Outlook for the Canadian Aquaculture Industry*, January 1989, p. 8.

[2] See Department of Fisheries and Oceans, *Aquaculture Development in Canada: A Guide to Federal Government Programs*, Supply and Services Canada, 1988.

[3] Such as Prince Edward Island's five-year $2.25 million Aquaculture Development Program.

[4] MOUs are not intended to be funding mechanisms.

[5] Marine culture of salmonids began in the 1960s with the first commercial production at a land-based site near Clam Bay, N.S., Richard L. Saunders, "Salmonid Mariculture in Atlantic Canada and Maine, USA," unpublished report, March 1989.

[6] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 32, 3 May 1988, p. 14.

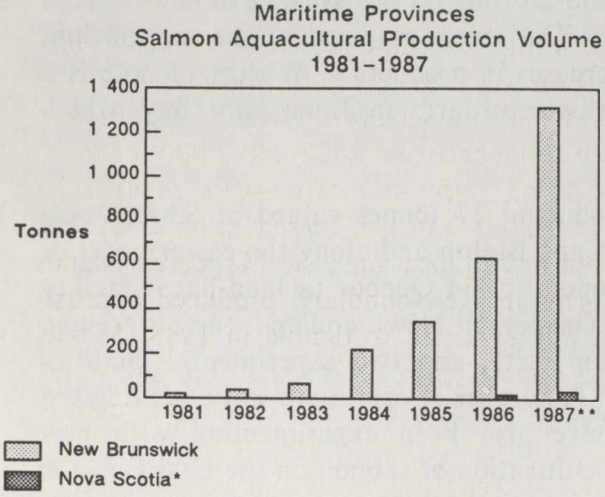
northeastern part of the province during the winter, these operations are located mainly in the Bay of Fundy area. Production in 1988 was more than twice the levels achieved in 1987 (Figure 1). Because of possible conflicts with traditional herring weir, lobster and scallop fisheries, the unknown effects of cage rearing on the environment, uncertainty as to the safe or optimum number of farms for a given area and to allow smolt producers to catch up with demand, a moratorium on the issuance of new licences in the Bay of Fundy was imposed in 1986. The recent removal of the moratorium (December 1988) should lead to further increases in production. Worthy of note is a federal Salmonid Demonstration and Development farm in Lime Kiln Bay, which opened in April 1986.

There were also 10 salmon farms (producing 37 tonnes valued at $300,000 in 1987) in Nova Scotia, located primarily in Cape Breton and along the eastern part of the province, and one vertically integrated operation in Quebec (a land-based facility located in the Baie des Chaleurs area of the Gaspé). In Newfoundland, there were two private operators, a provincial demonstration farm, and two experimental facilities operated by local development associations.[1] A number of operations in Prince Edward Island, including a land-based facility, have also been experimenting with new techniques for raising the fish. In short, the cultivation of salmon on the East Coast is expected to expand considerably in the coming years.

[1] The industry in Newfoundland suffered a major setback in 1988 when the stock of farmed salmon and smolts was destroyed because of infection.

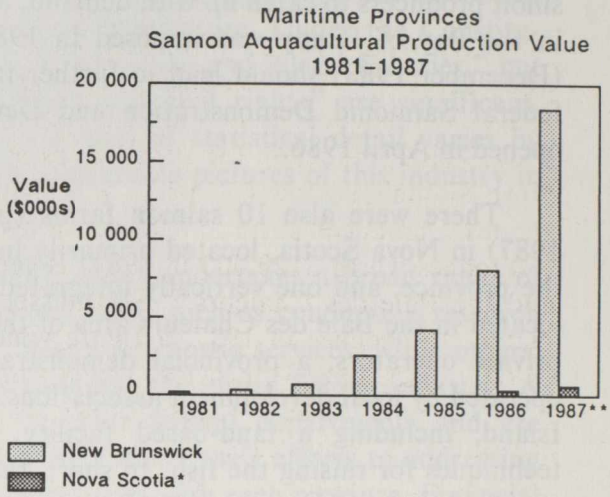
Figure 1

MARITIME SALMON AND MUSSEL PRODUCTION, 1981-1987



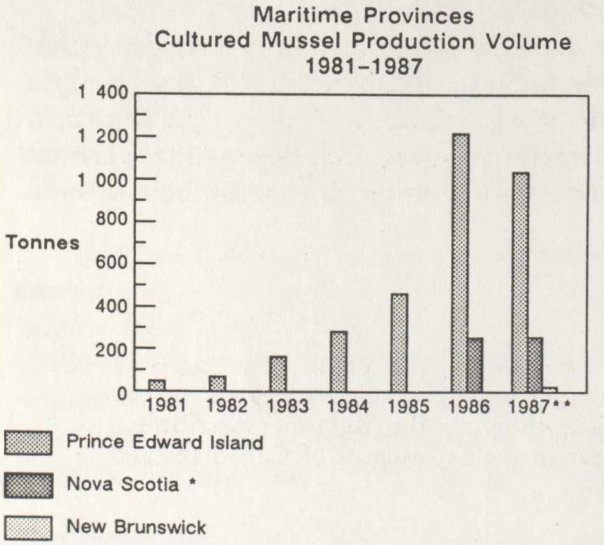
* Nova Scotia production data not available prior to 1986.
** Preliminary production figures.

Sources: 1) Province of Nova Scotia, Department of Fisheries.
2) Fiander-Good Associates Ltd., Economic Assessment of Salmonid Cage Culture Industry in Southwestern New Brunswick



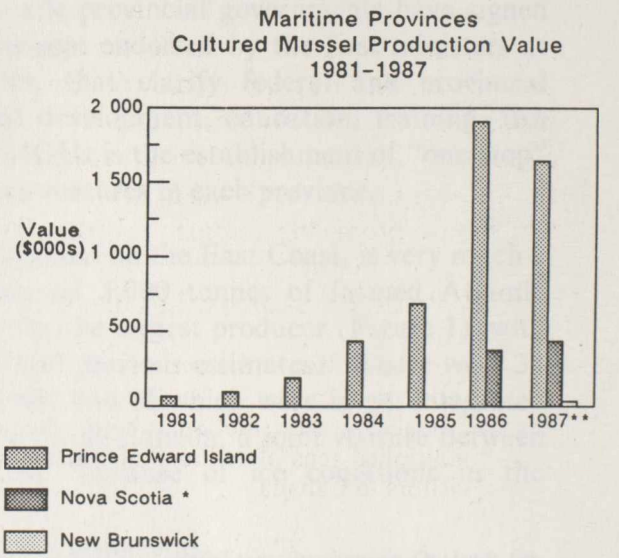
* Nova Scotia production data not available prior to 1986. (Estimated values for 1986).
** Preliminary production figures.

Sources: 1) Province of Nova Scotia, Department of Fisheries.
2) Fiander-Good Associates Ltd., Economic Assessment of Salmonid Cage Culture Industry in Southwestern New Brunswick



* Nova Scotia production data not available prior to 1986.
** Preliminary production figures.

Sources: 1) Federal Department of Fisheries and Oceans.
2) Province of Nova Scotia, Department of Fisheries.



* Nova Scotia production data not available prior to 1986.
** Preliminary production figures.

Sources: 1) Federal Department of Fisheries and Oceans.
2) Province of Nova Scotia, Department of Fisheries.

Source: Department of Fisheries and Oceans, *Commercial Aquaculture in Canada*, Supply and Services Canada, 1988, Figures 10, 11, 12, 13; p. 20, 22.

Trout farming, also an important commercial activity on the East Coast, uses cage culture techniques, some in conjunction with salmon farming, and private ponds, either for pay angling or the restaurant trade. Interestingly, there are two cod farming operations in Newfoundland, which buy undersized and commercial-size fish from fishermen, transport them to sea pens where they are fed, and then marketed during the winter months.

Approximately 95% of mussels harvested in the Maritime provinces are cultivated. The industry is well-established in Prince Edward Island, where approximately 30 active sites produced more than 1,000 tonnes of blue mussels, worth over $1.7 million in 1987. Total production for 1988 was expected to be between 1,800 and 2,000 tonnes.[1] Nova Scotia's 60 mussel farms, of which a dozen or so were large-scale commercial ventures, produced some 257 tonnes valued at $430,000 in 1987. Production in Quebec (60 tonnes worth $120,000 in 1987) is centred in two locations: the Magdalen Islands and the Baie des Chaleurs.[2] Six mussel farms in Newfoundland produced approximately 100 tonnes in 1987, a figure which was expected to double in 1988. Mussel cultivation in New Brunswick, which started approximately a decade ago, has so far attracted only modest interest (10 tonnes in 1987), but is also expected to increase in the Gulf of St. Lawrence.

The cultivation of oysters (the American and the European oyster) on the East Coast has grown, but less so than that of mussels and salmon.[3] There were between 700 and 850 leases held in New Brunswick in 1987, the majority being of a non-commercial nature.[4] Nova Scotia's production amounted to about 29 tonnes. In Prince Edward Island, where approximately 900 private leases were issued (of which 10% were held by active commercial operations), over 1,300 tonnes were harvested in 1987.

Because aquaculture in the Atlantic region varies from province to province, either because of differing provincial policies,[5] or because of environmental and climatic conditions, opportunities for aquaculture vary also. Although of lesser significance in current production, there is a great deal of interest and research being undertaken on the cultivation of other species, such as scallops, clams, lobster, Irish moss, halibut, etc., which have promising commercial potential.

C. The Recreational Fishery

> You can measure commercial fishing results by the tonne. You measure sportfishing results in hours and days and weeks of fishing opportunity. . . The end product is the emotional high, the kick, the fun, the fight of sportfishing, multiplied tens of millions of times a year in the experiences of Canadians and visitors to Canada.
>
> *The Honourable Tom Siddon, Minister of Fisheries and Oceans, Recreational Fisheries Conference*, 14 October 1986

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(1) Department of Fisheries and Oceans, *Commercial Aquaculture in Canada*, 1988, p. 22.
(2) *Ibid.*, p. 17.
(3) *Ibid.*, p. 29.
(4) Approximately 75% of the province's 1987 harvest of 1,250 tonnes came from public beds. Breakdowns between the cultivated and captured fisheries are not available.
(5) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 32, 3 May 1988, p. 14.

Recreational (or sport) fishing is increasingly being recognized by governments across the country as a valuable and legitimate user of the resource. According to a recent survey carried out in 1985, about 5.6 million Canadians and 900,000 tourists fished in Canada's marine and inland waters, spending an estimated $4.4 billion on supplies, services and durables directly related to this activity,[1] an increase of 76% over 1980 after adjusting for inflation.

On the East Coast, anglers pursue a variety of freshwater fish (e.g., trout, bass, perch, northern pike, pickerel), anadromous (e.g., Atlantic salmon and smelt) and marine species (e.g., cod, mackerel, pollock, flounder and bluefin tuna). Compared to that of the Pacific, however, the Atlantic Coast marine sportsfishery is much less developed. Angling for freshwater fish is the predominant recreational fishing activity.[2] DFO therefore devotes much less effort to regulating the activity in the region's marine waters.

Although the federal government retains responsibility for administering freshwater fisheries in the Maritimes and Newfoundland,[3] the provinces license recreational fishermen in these waters. Quebec, on the other hand, manages its inland fisheries and coastal fisheries for anadromous species in saltwater on behalf of the Government of Canada. Fisheries management therefore requires cooperation between the federal and provincial levels of government in order to conserve, restore and enhance recreational fisheries; maintain a high quality and diversity of fishing opportunities; encourage a viable industry; and promote tourism.[4] A number of private organizations also contribute towards improving sportfishing opportunities in the region.

DFO spends about $17 million for recreational fisheries on the East Coast, and manages its program through its four regional offices and over 180 district and area offices and research facilities. The Department directs most of its effort toward Atlantic salmon, which is not only the species immediately looked upon as king among sportfish, but also the most controversial because salmon are limited in numbers and also sought after by commercial and native fishermen.

According to the 1985 survey on sportfishing, there were over 1.72 million anglers in Quebec, Newfoundland and the Maritimes, 94.9% of whom were residents of their province (Table 6). Approximately 53.2% of non-resident anglers were Canadians; most non-residents came from the United States (New England and the mid-Atlantic states). In total, licensed anglers caught over 125 million fish (in total weighing over 40,000 tonnes), and devoted about 21.2 million days to sportfishing.

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(1) Every five years, DFO conducts a survey of sportfishing in Canada in conjunction with provincial and territorial sportfishing agencies. See Department of Fisheries and Oceans, *Sportfishing in Canada, 1985*, Supply and Services Canada, 1988.

(2) Brook trout is the favoured species of anglers in freshwater. *Ibid.*, p. 2.

(3) The exception is Nova Scotia, where the provincial government assumes responsibility for managing trout. Under the Constitution, the federal government cannot enter into leases which confer property rights, nor can it adopt laws to transfer fishing privileges.

(4) Department of Fisheries and Oceans, *Annual Report: 1986-1987*, p. 7.

TABLE 6

TOTAL ACTIVE ANGLERS BY PROVINCE, 1985

	Resident	Non-Resident Canadian	Non-Resident Other	Total
Quebec	1,204,593	38,012	31,131	1,273,736
New Brunswick	156,873	2,936	6,290	166,099
Newfoundland	159,510	2,801	1,610	163,921
Nova Scotia	99,554	1,214	1,410	102,178
Prince Edward Island	15,095	1,808	717	17,620

Source: Department of Fisheries and Oceans, Sportfishing Survey Results for the Five Atlantic Provinces, 1985.

A number of briefs submitted by various sportfishing interests in the region emphasized the economic importance of their sector; cited were the dollar values generated by sportfish landed, the economic spinoffs generated by the fishery, and its low consumptive nature. Anglers reportedly spent about $665.5 million in 1985 on activities and supplies directly connected with their sport, and invested $673.8 million on major durables and property (Table 7).

TABLE 7

EXPENDITURES RELATED TO RECREATIONAL FISHING (IN DOLLARS) BY PROVINCE, 1985

	Direct Expenditures[1]	Major Purchases or Investment[2]	Total
Quebec	587,288,851	586,725,420	1,174,014,271
Newfoundland	36,238,889	39,708,064	75,946,953
New Brunswick	24,787,533	26,471,214	51,258,747
Nova Scotia	15,198,964	19,241,802	34,440,766
Prince Edward Island	2,031,516	1,693,842	3,725,358
TOTAL	665,545,753	673,840,342	1,339,386,095

[1] Directly attributable to sportfishing, including food and lodging, licences, transportation, fishing services, fishing gear, etc.

[2] Relating in whole or in part to sportfishing, including fishing equipment, boats and related equipment, camping equipment, special vehicles (ATVs, snowmobiles, camper trucks, etc.), buildings, etc.

Source: Department of Fisheries and Oceans, Sportfishing Survey Results for the Five Atlantic Provinces, 1985.

D. The Native Fishery

> The fishery is vitally important to our people. We believe that all aspects of the fishery, from conservation and management to the marketing of the product are all related.
>
> *Proceedings*, 21 May 1988, p. 23

Fish are also harvested by native people for food or subsistence purposes. Although information is sparse on the number of fishermen involved and their catches,[1] it is known that there are about 55,000 native Indians belonging to 70 different bands in Newfoundland, the Maritimes and Quebec, 35,000 of whom live on 102 reserves (Table 8).

TABLE 8

INDIAN BANDS AND RESERVES BY PROVINCE, 1988[1]

	Bands	Band Members	Reserves	Area (Hectares)
Quebec	39	38,962	33	74,881
New Brunswick	15	7,160	26	17,791
Nova Scotia	13	7,142	39	11,468
Prince Edward Island	2	650	4	675
Newfoundland	1	684	0	0
TOTAL	70	54,598	102	104,815

[1] Indian and Inuit settlements in Quebec and Labrador are not included in the above figures.

Source: Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 30 November 1988.

In total, 14 food fish licences for salmon are issued annually by the federal government and the Province of Quebec. Some bands are allocated a quota while others are limited by the number and length of nets that can be used.[2] Native food fishing is accorded first priority, subject to the overriding needs of resource conservation, followed by other interests.[3] In recent years, to allow stocks of salmon to recover, there has been no expansion of the native food fishery.[4]

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(1) Peter H. Pearse, *Rising to the Challenge: A New Policy for Canada's Freshwater Fisheries*, 1988, p. 76.

(2) Licences specify seasonal restrictions, the number of days per week open for fishing, and the location of nets. Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 30 November 1988.

(3) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 48, 23 June 1988, p. 9.

(4) Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 30 November 1988.

During its hearings, the Committee also learned that native fishermen wish to harvest species other than salmon, not only for subsistence, but for commercial purposes as a means of promoting economic self-sufficiency and preserving culture in native communities. In some areas of the East Coast, native access to the resource and involvement in its management are key components of land claims. While the legal merits of land claims, and the interpretation of Treaty and aboriginal entitlements are outside the Committee's terms of reference, the Committee hopes that the federal government will move to clarify the rights of native people to participate in and manage the fisheries in the region.[1]

A number of initiatives to promote economic development were reported underway. In keeping with native interests in exercising management control over the resource, six Indian bands in New Brunswick enforce food fishery regulations by hiring native wardens from their own band members. Certain native food fisheries are also being converted into recreational fisheries (e.g., those of the Micmac Indians of the Maria Reserve in Quebec and of the Kingsclear Indian Band in New Brunswick), and some bands are showing an interest in farming salmon. The Maliset Indians on the Tobique Reserve in New Brunswick, for example, were to have started construction of a $1.6 million salmon hatchery which would raise smolts to be sold to salmon farmers in the Bay of Fundy. As well, the Maliset intended to go into salmon farming in the future.[2]

THE PROCESSING SECTOR

About 30,000 workers are employed in fish processing, the single most important manufacturing activity in terms of employment and output in three of the five Atlantic provinces. There are approximately 890 processing plants on the East Coast, located in some 450 coastal communities (Table 9). Only about 35% of facilities, however, operate year-round. Between 1982 and 1986, processing averaged annual wholesale values of about $1.63 billion, roughly doubling the landed value of catches (Table 10). In 1986, Nova Scotia led production both in terms of value and volume, followed by Newfoundland. According to preliminary figures for 1987, Atlantic production increased by 16% in value over 1986 to reach $2.4 billion, due primarily to higher market prices.

Most processing plants are independently owned or are producers' cooperatives, but many belong to vertically integrated companies. Vertical integration (i.e., processors' ownership of their own fishing fleets) is especially predominant in the Atlantic offshore trawling and scallop-dragging fisheries. Three major vertically integrated companies, Fishery Products International, National Sea Products and

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[1] According to Dr. Peter H. Pearse, there are few treaties in the Maritimes and Newfoundland, but those that exist confirm the rights of natives to fish. Aboriginal rights in eastern and southern Quebec would also appear to be intact. Pearse (1988), p. 81.

[2] Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 30 November 1988.

Clearwater Fine Foods, not only account for well over 50% of all East Coast production,[1] they are also among the largest fish processing companies in the world, with subsidiary operations in the United States and other countries.

Inshore fishermen sell mainly to smaller-scale independent processors, although vertically integrated companies also operate facilities supplied exclusively by inshore fishermen. Many of these are collection stations or "feeder" plants which partly process the fish for delivery to larger plants. Inshore fishermen may also sell directly to the consumer and, in some cases, sell their catch to foreign vessels for processing offshore.

TABLE 9

SELECTED FISHERIES STATISTICS BY PROVINCE, 1987

Province	Number of Fishermen	Number of Plant Workers	Number of Fish Plants
Newfoundland	29,022	10,620	244
Nova Scotia	15,921	9,700	307
New Brunswick	7,934	6,480	177
Quebec	6,815	1,840	106
Prince Edward Island	4,771	1,360	56

Source: Karl Laubstein, "Canada's Atlantic Fisheries: the Role of the Inshore Section", *Maritime Affairs Bulletin*, No. 2, 1989, p.4.

It has also been argued that in some cases, financing and other arrangements between processors and fishermen can bind a vessel's catch to a company as closely as if the vessel were directly owned.[2] A Resource-Short Plant Program (RSPP) provides a specific amount of offshore caught fish to designated seasonal fish processing plants in the five Atlantic provinces during the off-peak fishing season.

Atlantic processors produce a variety of products which take many different forms — salted, pickled, marinated, fresh, frozen, filleted, canned, breaded and battered, etc., although it may still be said that the industry, "with notable exceptions . . . specializes in providing large volumes of moderately priced commodity packs of medium and some

[1] Department of Fisheries and Oceans, *1989-90 Estimates, Expenditure Plan, Part III*, p. 22.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 26, 5 February 1988, p. 74.

TABLE 10

VALUE OF EAST COAST PRODUCTION (IN $'000) BY SPECIES GROUP AND PROVINCE, 1982-1986

	1982	1983	1984	1985	1986
Groundfish					
Nova Scotia	342,875	306,888	329,868	392,263	526,609
Newfoundland	375,362	353,834	345,240	364,281	435,284
Quebec	45,504	43,708	70,258	90,738	104,815
New Brunswick	21,145	23,456	18,420	26,067	35,000
Prince Edward Island	16,791	24,624	16,200	12,953	15,441
Pelagic					
New Brunswick	115,001	103,354	112,092	145,391	124,809
Newfoundland	43,254	34,057	47,324	42,528	92,655
Nova Scotia	37,982	27,204	50,033	69,024	72,000
Prince Edward Island	5,959	5,814	4,312	4,061	10,095
Quebec	6,736	4,636	4,855	5,774	7,685
Shellfish					
Nova Scotia	141,843	162,012	143,610	155,555	238,000
New Brunswick	152,363	187,610	162,314	146,982	186,387
Quebec	50,849	70,697	61,549	87,642	97,111
Newfoundland	80,301	65,996	55,730	67,535	72,483
Prince Edward Island	35,003	54,289	37,256	46,000	58,223

Source: Department of Fisheries and Oceans, Economic Analysis and Statistics Division, 7 December 1988.

lower quality products to food service and industrial buyers."[1] Although the groundfish sub-sector contains some very efficient plants, a significant weakness is the existence of several inshore facilities located in small remote communities along the Atlantic coastline, where production is limited by the shorter inshore fishing season.[2]

The bulk of the groundfish catch goes into the production of frozen fillets and frozen fillet blocks which later undergo further processing to be made into fish sticks and other similar products. Much of this, the Committee learned, takes place in the United States. Increasingly, part of the catch is sold fresh, mostly in filleted form, in response to strong demand in the North American market. In Newfoundland and the Quebec north shore, the Canadian Saltfish Corporation, a Crown corporation, has a monopoly on the sale of saltfish products.

[1] Task Force on Atlantic Fisheries (1982), p. 150.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 36, 13 May 1988, p. 86.

Small- and medium-sized, independently owned and operated establishments are involved in the processing of pelagic species, which are often marketed on a commodity basis. The exception is Connors Brothers Limited, which produces canned herring and sardines as a branded product to over 40 countries.[1] Clearwater Fine Foods, through the acquisition of several firms, has also emerged as an important herring processor. National Sea Products and Fishery Products International, while involved in herring processing, have reduced their operations since the late 1970s when Canadian herring was in greater demand in Europe.

Apart from being canned, herring is also processed into frozen (whole or filleted), pickled, or cured forms (including salted and vinegar-cured), is used for lobster bait and is sometimes made into fish meal. A number of companies on the East Coast produce Atlantic herring roe for the lucrative Japanese market.[2] Capelin, which is processed in Newfoundland, is sold almost exclusively in frozen form for the roe content. Mackerel is primarily fished for bait, with some canned and cured product. Although the East Coast does not have a significant commercial tuna fishery, tuna is imported for canning by Star-Kist Canada. Atlantic salmon, a species which commands a higher price than most other fish, is marketed fresh, frozen or smoked.

Major firms which process shellfish are Clearwater Fine Foods, National Sea Products and, until recently, United Maritime Fishermen (UMF). The balance of the sub-sector is made up of many private operations which specialize in one or a few species. Given that the entry of new participants in this profitable activity is relatively easy,[3] competition to access Atlantic supplies has, in recent years, been intense. Shellfish are also marketed in various forms. Scallops, for example, are sold in breaded or partially cooked, frozen, or fresh-chilled form. For lobster, the principal product forms are live, frozen meat, frozen lobster in the shell, and canned lobster.

PRIMARY MARKETS

In 1987, Canada was for the tenth consecutive year the world's leading exporter of seafood, in terms of value. In 1988, however, the United States displaced Canada from its number one position. The total value of Canadian fish exports that year was $2.7 billion (a 2.6% decrease from 1987). The United States remained Canada's most important export market (52.5% of the value of total exports), followed by Japan (22.3%) and the European Community (16.5%), with the balance being sold to over 70 other countries around the world (8.7%) (Table 11). According to trade categories, exports consisted of fresh or frozen shellfish (25.3%), fresh or frozen fillets and blocks (24.2%), fresh or frozen whole or dressed fish (19.6%), roe products (9.5%), smoked, salted, dried or cured fish (8.3%), canned fish (6.7%), and other products (6.3%). In value terms (most recent available figures), Atlantic seafood exports in 1986 represented about 70% of the Canadian total.[4]

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[1] *Ibid.*, Issue No. 47, 20 June 1988, p. 37.

[2] Between 70 to 90 companies. *Ibid.*, Issue No. 1, 4 November 1986, p. 21.

[3] Shellfish processing has a lower average fixed asset investment than other subsectors.

[4] Department of Fisheries and Oceans, *The Canada-U.S. Free Trade Agreement and Fisheries: An Assessment*, Supply and Services Canada, 1988, p.10. Detailed breakdowns for East Coast exports are not available. Canada exports more than 80% of the value of its fishery products.

Over three-quarters of Atlantic groundfish production is exported,[1] with the United States accounting for more than 80% of the total. Frozen cod fillets and blocks are the largest groundfish export items. The European Community (EC), especially Portugal,[2] continues to be the largest market for saltfish, mostly cod, although saltfish products are also exported to the United States, the Caribbean and Latin America. Japan has not traditionally been a significant importer of Atlantic groundfish.[3]

TABLE 11

DESTINATION OF CANADIAN SEAFOOD EXPORTS (IN $ MILLIONS), 1986-1988

	1986	1987	1988
United States	1,431	1,624	1,418
Japan	445	481	603
European Community	354	437	447
All other countries	203	231	233
TOTAL	2,433	2,773	2,701

Sources: Department of Fisheries and Oceans, *Canadian Fisheries International Trade*, Vol. 9, No. 12, December 1987; Department of Fisheries and Oceans, 1 November 1989.

More than half of Atlantic pelagic production is exported, with Japan accounting for over a quarter of exports,[4] and the principal products being Atlantic herring roe and capelin with roe. About a quarter is destined for the United States and consists mostly of cured herring in barrels, canned and fresh whole herring. Fresh herring is sold to New England canners, an amount often offset by similar volumes purchased by Canadian processors.[5] Exports to Europe consist mainly of frozen herring products. Although Atlantic mackerel is harvested primarily for bait, some quantities are canned for food aid, and smaller volumes are salted and packed in 100-kilogram barrels for the United States and Caribbean markets. Herring and mackerel are also sold to East Bloc countries under bilateral agreements.

[1] Department of Regional Industrial Expansion/Ministry of State for Science and Technology, *Fishery Products — Atlantic Groundfish: Industry Profile*, Supply and Services Canada, 1988, p. 2.

[2] Portugal alone absorbed half of Canada's saltfish production in 1987.

[3] Japanese demand for Canadian redfish, however, has steadily increased in recent years, from a few hundred tonnes in the early 1980s to 2,800 tonnes in 1987.

[4] Department of Regional Industrial Expansion/Ministry of State for Science and Technology, *Fishery Products — Atlantic Pelagics: Industry Profile*, Supply and Services Canada, 1988, p. 2.

[5] A practice necessitated by the variable catches of canning size herring caught by New Brunswick and Maine weir fishermen.

More than 70% of Atlantic shellfish production is exported, with about three-quarters of exports (half of Canadian lobster and crab exports and most scallops) destined for the United States.[1] With respect to shrimp, about half of Canadian exports go to the United States, with lesser quantities to Europe and Japan. The European Community is the second most important export market for Atlantic shellfish, followed by Japan.

[1] Department of Regional Industrial Expansion/Ministry of State for Science and Technology, *Fishery Products — Atlantic Shellfish: Industry Profile*, Supply and Services Canada, 1988, p. 2.

CHAPTER IV

Market Trends and Challenges

> But if cod is king, its long reign may be coming to an end. That is, at least, its reign as king of commodities.
>
> *Seafood Business*, July /August 1988, p. 81

> The productive capacity of the world's oceans has been long stabilized and, indeed, may be declining, while the population of the world and its protein demands continue to grow exponentially.
>
> *Proceedings*, 12 May 1988, p. 39

NORTH AMERICA

Recent years have seen major changes in the North American seafood market: an increased emphasis on high quality products, more efficient transportation and handling systems, the introduction of new products and species, more aggressive promotions and media advertising to compete with poultry and red meat. Seafood is eaten more than ever before for reasons of health and nutrition, as a sophisticated gourmet item, or simply for its taste.[1] Whereas in the past, fish was associated in some religions with fasting and often regarded as a poor product sold to poor people, it may be said that the North American consumer has finally learned its true worth.

As Canadians and Americans have become more diet-conscious, their consumption of beef and pork has declined in favour of poultry and fish[2] (Table 12). Prices for

[1] Seafood is an excellent source of low calorie protein. Research shows that fish is rich in omega-3 fatty acids which, among other things, appear to reduce blood pressure, relieve arthritis, and alleviate common skin disorders.

[2] Canadian per capita consumption of beef declined from an estimated 45.7 kg in 1978 to 38.2 kg in 1987. Statistics Canada, "Apparent Per Capita Food Consumption in Canada," Catalogue 32-229, 1988, p. 9, 21.

seafood, however, have risen more rapidly than those for poultry, particularly chicken, which is a much cheaper alternative to fish.[3]

TABLE 12

PER CAPITA CONSUMPTION OF BEEF, PORK AND POULTRY IN CANADA AND THE UNITED STATES, 1985-1987

		1985	1986	1987
Canada				
Beef	kg	38.8	39.5	38.2
	lb.	85.5	87.1	84.2
Pork	kg	28.5	27.9	28.7
	lb.	62.8	61.5	63.3
Poultry	kg	25.1	26.2	27.7
	lb.	55.3	57.8	61.1
Fish	kg	7.0	7.6	7.2
	lb.	15.4	16.8	15.9
United States				
Beef	kg	35.6	34.6	34.3
	lb.	78.5	76.3	75.6
Pork	kg	28.1	26.6	26.7
	lb.	61.9	58.6	58.8
Poultry	kg	25.0	25.5	27.6
	lb.	55.1	56.3	60.8
Fish	kg	6.5	6.7	7.0
	lb.	14.4	14.7	15.4

Sources: Department of Fisheries and Oceans, Economic and Commercial Analysis Directorate, *Market Report No. 3*, August 1988, p. 12; Department of Fisheries and Oceans, Economic Analysis and Statistics Division, 18 July 1989; Statistics Canada, "Apparent Per Capita Food Consumption in Canada," Catalogue 32-229, 1988, p. 21; Department of Agriculture, "Handbook of Food Expenditures, Prices and Consumption," October 1988, p. 217-218, 224, 227.

[3] Seafood prices in the United States have reportedly been rising an estimated 10% per year compared with a 4% rise for beef and 3% for poultry. Between 1981 and 1987, Canadian consumer prices for fish increased by about 47% compared to 31% for meat and 29% for poultry. "Seafood's Future," *Seafood Business*, Vol. 7, No. 7, November/December 1988, p. 8; Department of Agriculture, *Handbook of Food Expenditures, Prices and Consumption*, Supply and Services Canada, October 1988, p. 65.

Growing resistance to higher priced species of groundfish, especially cod, at the wholesaler, distributor and consumer level in the United States in fact began in the last quarter of 1987. By mid-1988, inventories of cod blocks were triple the levels recorded for the same period in 1987; for frozen cod fillets, they were 61% higher. High inventories, in turn, led to a precipitous decline in the prices for these products. The resulting brisk sales later in 1988 helped to bring inventories down and prices back up. Despite quota reductions for major cod-producing countries in 1989, most industry observers are now finding it difficult to predict prices and trends even in the short term.

A. The United States

Per capita consumption of fish in the United States rose for a fifth consecutive year to a record 15.4 pounds (edible meat) in 1987. The most recent data, however, point to a drop of 0.4 pound to 15.0 pounds in 1988[1] (Table 13). Reasons for weakening demand include consumer resistance to high prices, the negative publicity in the media concerning toxins, contaminants and water pollution, and lack of promotion compared to that for poultry, pork and beef.

American consumers spent about $U.S.28.8 billion on seafood, including $U.S.19.7 billion in expenditures in the food service sector (e.g., restaurants, carry-outs, caterers, etc.); $U.S.8.9 billion in retail stores for home consumption; and $U.S.214.0 million for industrial products.[2] Consumption of fresh and frozen seafood declined by 0.4 pound, with other categories remaining steady. Consumption of canned tuna, the biggest single seafood item on the American dinner plate, increased from 3.5 pounds in 1987 to 3.6 pounds in 1988. Fresh and frozen finfish consumption was 5.9 pounds per capita, for shellfish 3.7 pounds, and for farmed-raised catfish approximately 0.6 pound.

In round weight, the American supply of seafood (domestic landings and imports combined) was a record 4.79 million tonnes in 1987, but declined to 4.76 million tonnes in 1988[3] (Table 14). As well, the value of imports, which was at its highest ever at $U.S.5.7 billion in 1987, or 18.6% more than the previous record established in 1986, dropped by 4.4% (Table 15). Although Canada continues to be the largest supplier of seafood to the United States (21.3% of the total value of imports in 1988), this country's share of the market decreased by 0.4%. Others registered rates of growth during this period, such as Ecuador which more than doubled the value of its shipments between 1985 and 1988 (Table 16). Interestingly, American fish exports (edible) were at a record level ($U.S.2.2 billion in 1988),[4] with major markets being Japan (67.0% of value), Canada (10.0%), France (4.6%) and the United Kingdom (4.3%).

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[1] Small changes in per capita consumption have enormous effects in very large markets like the United States. Not included is an estimated consumption of three to four pounds per recreational fisherman, which would bring the total to almost 19 pounds edible weight in 1988.

[2] In producing and marketing fishery products, the fishing industry in the United States is estimated to have contributed $U.S.17.0 billion in value added to domestic GNP. United States Department of Commerce, *Fisheries of the United States 1988*, Current Fishery Statistics, No. 8800, May 1989, p. 84.

[3] The United States imported about 56.3% of its domestic supply requirements by weight. Imports declined by 10.6%; domestic landings rose by 16.3%.

[4] Does not include $U.S.221.1 million received for American catches transferred to foreign vessels for further processing.

TABLE 13

UNITED STATES PER CAPITA CONSUMPTION OF FISH AND SHELLFISH, HISTORICAL OVERVIEW[1]

	Population (in millions)	Per Capita Consumption (pounds, edible meat) Fresh/Frozen	Canned[2]	Cured[3]	Total
1917	103.3	6.2	2.0	2.7	10.9
1927	119.0	7.0	3.9	1.3	12.2
1937	128.6	5.6	5.3	0.9	11.8
1947	143.1	5.8	3.8	0.7	10.3
1957	169.1	5.5	4.0	0.7	10.2
1967	195.3	5.8	4.3	0.5	10.6
1977	218.1	7.7	4.6	0.4	12.7
1978	220.5	8.1	5.0	0.3	13.4
1979	223.0	7.8	4.8	0.4	13.0
1980	225.6	8.0	4.5	0.3	12.8
1981	227.7	7.8	4.8	0.3	12.9
1982	229.9	7.7	4.3	0.3	12.3
1983	232.0	8.0	4.8	0.3	13.1
1984	234.8	8.5	4.9	0.3	13.7
1985	237.0	9.0	5.1	0.3	14.4
1986	239.4	9.0	5.4	0.3	14.7
1987	241.5	10.0	5.1	0.3	15.4
1988	243.9	9.6	5.1	0.3	15.0

[1] Does not include fish caught by the recreational fishery.
[2] Record of 5.8 lb. set in 1936.
[3] Record of 4.0 lb. set in 1909.

Source: United States Department of Commerce, *Fisheries of the United States 1988*, Current Fishery Statistics, No. 8800, May 1989, p. 79.

In the mid-1980s, a number of factors pushed the demand for seafood in the United States well beyond the level that traditional suppliers of North Atlantic cod fillets and blocks could meet. This led to the introduction of such non-traditional and often exotic-sounding species as orange roughy, mahi mahi, hoki, oreo dory, grenadiers and mako shark. The result was an estimated decline in the market share of cod by about 10% between 1984 and 1987. For blocks, the figure may be closer to 15%.[(1)] In fact, Canadian producers of cod and other groundfish, who had about 40% of the

[(1)] A.D. Chandler, "King Cod," *Seafood Business*, Vol. 7, No. 4, July/August 1988, p. 85. Virtually all block supplies in the United States are imports used for processing.

United States market in 1987,[1] are now pitted not only against traditional competitors (Icelandic, Danish and Norwegian) in the mid- and high-priced strata, but also against a growing number of non-traditional suppliers, notably New Zealand, the Republic of Korea, Poland and South America in the lower price range.

TABLE 14

UNITED STATES SUPPLY OF EDIBLE COMMERCIAL FISHERY PRODUCTS, 1981-1988 (ROUND WEIGHT)

	Domestic Landings ('000 Tonnes)	%	Imports ('000 Tonnes)	%	Total ('000 Tonnes)
1981	1,609.3	42.9	2,141.6	57.1	3,750.9
1982	1,490.5	41.2	2,124.7	58.8	3,615.2
1983	1,469.1	38.2	2,348.1	61.5	3,817.2
1984	1,506.4	39.1	2,349.3	60.5	3,855.7
1985	1,494.6	35.3	2,741.8	64.7	4,236.4
1986	1,539.5	35.5	2,825.3	64.5	4,364.8
1987	1,790.4	37.4	3,001.3	62.5	4,791.7
1988	2,081.7	43.7	2,684.6	56.3	4,766.3

Source: United States Department of Commerce, *Fisheries of the United States 1988*, Current Fishery Statistics, No. 8800, May 1989, p. 67.

The possibility that new species of fish will be further substituted for cod should be of grave concern to Canadian producers because of the sheer size of some of those stocks and the favourable economics of harvesting them. Argentine hake, for example, (also known as whiting) is found off the coasts of many countries, and their huge quantities are only beginning to be tapped.[2] A very large groundfish resource (well over 2 million tonnes annually) is available within the United States Exclusive Economic Zone (EEZ) in the North Pacific Ocean. American domestic landings of Alaska pollock inside the American 200-mile limit (the biggest single species harvested in the world)[3] rose to about 1.4 million tonnes in 1988, or about 370,000 tonnes more than the TAC for all species of groundfish on the East Coast of Canada that year. American landings of Pacific cod increased from about 137,000 tonnes in 1987 to 232,700 tonnes in 1988.

[1] Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 2 December 1988.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 23.

[3] "Cod vs. Alaska Pollock: The Heavyweights Fight it Out," *Seafood International*, September 1988, p. 120.

TABLE 15

UNITED STATES EDIBLE FISHERY PRODUCTS IMPORTS BY CATEGORY, 1985-1988

Category	Value ($U.S.'000) 1985	1986	1987	1988
Fresh/Frozen				
Whole or dressed cod, cusk and other groundfish	67.5	83.7	88.3	78.1
Salmon	75.6	100.7	113.0	155.2
Tuna	379.1	453.6	513.8	575.7
Fillets and steaks	713.9	826.8	1,115.1	909.9
Blocks	275.1	379.9	539.4	382.5
Shrimp	1,120.7	1,404.9	1,676.8	1,726.0
Lobsters	464.9	464.9	576.0	546.7
Scallops	147.1	192.5	162.3	115.7
Surimi analogs	48.2	66.5	58.1	41.6
Other fish and shellfish	217.7	243.0	237.3	223.0
Sub-total	3,509.8	4,216.5	5,080.1	4,754.4
Canned				
Tuna	209.1	228.6	206.9	298.7
Shrimp	32.2	29.4	33.4	28.7
Other fish and shellfish	224.5	234.4	268.6	259.5
Sub-total	465.8	492.4	508.9	586.9
Cured				
Salted cod, haddock, cush, other groundfish	41.2	49.5	60.5	52.7
Other	29.8	30.5	32.4	36.3
Sub-total	71.0	80.0	92.9	89.0
Other Fish and Shellfish Products	17.7	24.6	29.3	29.1
TOTAL	4,064.3	4,813.5	5,711.2	5,459.4

Source: United States Department of Commerce, *Fisheries of the United States* for 1985, 1986 1987 and 1988, Current Fisheries Statistics, Nos. 8368, 8385, 8700 and 8800.

TABLE 16

LEADING SEAFOOD SUPPLIERS TO THE UNITED STATES BY REGION AND COUNTRY, 1985-1988

Origin	Value ($U.S.'000) 1985	1986	1987	1988
North America				
Canada	840.8	1,020.0	1,240.8	1,161.7
Mexico	319.8	372.4	475.9	382.0
Other	265.4	324.4	335.1	297.5
Sub-total	1,426.0	1,716.8	2,051.8	1,841.2
South America				
Ecuador	191.6	307.6	415.1	420.8
Brazil	141.2	123.8	129.7	125.5
Other	249.4	295.3	308.8	257.1
Sub-total	582.2	726.7	853.6	803.4
Asia				
Japan	333.3	325.8	277.8	211.9
Thailand	206.8	241.0	244.5	345.9
Taiwan	175.3	256.7	351.9	285.3
Other	416.2	558.8	813.5	1,023.1
Sub-total	1,131.6	1,382.3	1,687.7	1,866.2
Europe				
Iceland	207.7	209.9	234.1	164.8
Norway	139.1	165.7	196.6	172.4
Denmark	100.9	104.6	159.9	112.9
Other	180.1	201.0	230.4	173.0
Sub-total	627.8	681.2	821.0	623.1
Africa	70.9	68.1	32.0	41.1
Australia and Oceania	225.8	238.4	265.1	284.4
TOTAL	4,064.3	4,813.5	5,711.2	5,459.4

Source: United States Department of Commerce, *Fisheries of the United States* for 1985, 1986, 1987 and 1988, Current Fisheries Statistics, Nos. 8368, 8385, 8700 and 8800.

Producers of farmed Atlantic salmon on the East Coast, on the other hand, are expected to remain competitive mainly because of their proximity to the northeastern United States, a location with transportation and delivery time advantages over that of other world producers. Although the growth in American demand, as well as that in Japan and the EC, is expected to continue, a projected increase in total world production from many countries should be of concern to Canadian producers since it is unclear when market saturation will be met. Atlantic herring products are competitive in the United States, but consumption has at best been static.[1]

[1] Department of Regional Industrial Expansion and Ministry of State for Science and Technology, *Fishery Products — Atlantic Pelagics: Industry Profile*, Supply and Services Canada, 1988, p. 3.

Shellfish are generally very much in demand because of limited supply. Shrimp accounted for 32% of the value of total American seafood imports in 1988,[1] and a number of countries are vying to supply this lucrative market.[2] Canadian cold water shrimp is expected to compete successfully with warm-water varieties because of its distinctive attributes (e.g., smaller size, differences in taste and texture) and pricing.[3] The Republic of Korea is a major supplier of crab products, Japan of scallops, and the United States of lobster. Because shellfish are so highly valued, a number of countries have been able to create a new market in the United States for surimi-based analogues.

B. The Domestic Market

The Committee's inquiries have found no comprehensive analysis of the domestic market, which ranks next to the United States in value for Canadian producers. Although there are obvious differences in size and apparently subtle differences in consumer tastes[4] between the Canadian and American markets, it may be said that consumption patterns in the two countries closely follow each other. An annual per capita usage in Canada of about 7.2 kilograms was estimated for 1987, down from 7.6 kilograms in 1986. Fresh and frozen fish is the biggest per capita seafood item, followed by canned fish. Cured fish is the least preferred (Table 17).

Despite this country's rich and varied fish and shellfish resources, other countries eat far more seafood per person. With an estimated liveweight per capita consumption of 21.4 kilograms,[5] Canada lags behind Iceland (88.4 kilograms), Japan (74.5 kilograms), Denmark (22.0 kilograms), Norway (46.0 kilograms), Portugal (36.6 kilograms), Finland (34.3 kilograms), Spain (34.2 kilograms), Sweden (29.4 kilograms), the Soviet Union (27.3 kilograms), and France (24.8 kilograms). Unfamiliarity with seafood would seem to be the key reason why Canadians are not consuming more fish.

As in the United States, Canada's seafood imports have grown such that Canada is now among the 10 leading world importers (a record 176,769 tonnes of fishery products in 1987 worth $696.8 million, increases of 30.2% and 40.5% respectively over 1985 (Table 18)). Since about 83% of these imports were edible, it can be stated that a very substantial percentage of domestic consumption is made up of imported products.[6] Imports were primarily from the United States (52.3% by value) followed by South America (8.8%0, the European Community (5.9%) and Japan (5.7%) (Table 19).[7]

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[1] A record 503.9 million pounds worth $U.S.1.75 billion.

[2] The growth in fish consumption in the United States is to a large extent attributable to an increase in the consumption of shrimp. Between 1979 and 1988, its consumption rose by 85%. In value terms, the leading American shrimp suppliers in 1988 were Mexico (17.7% of the total value of shrimp imports), Ecuador (21.7%) and China (17.1%). United States Department of Commerce, *Fisheries of the United States 1988*, p. 56.

[3] Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 2 December 1988.

[4] In terms of species, for example, turbot is more in demand in Quebec than in the United States. Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 34.

[5] Based on 1982-84 averages. United States Department of Commerce, *Fisheries of the United States 1988*, p. 82.

[6] This holds true, even when accepted yield conversion rates are factored in.

[7] By volume, about 64.5% of these were from the United States, indicating that many lower priced species and products are being exported to Canada.

TABLE 17

ANNUAL PER CAPITA CONSUMPTION OF FISH AND SHELLFISH IN CANADA, 1982-1987

Year	Fresh/Frozen (kg)	Fresh/Frozen (lb.)	Canned (kg)	Canned (lb.)	Cured (kg)	Cured (lb.)	Total (kg)	Total (lb.)
1982	4.23	9.32	1.78	3.92	0.24	0.53	6.25	13.77
1983	4.27	9.41	2.05	4.52	0.11	0.24	6.43	14.17
1984	4.28	9.43	2.05	4.52	0.17	0.37	6.50	14.32
1985*	4.66	10.27	2.19	4.83	0.10	0.22	6.95	15.32
1986*	5.41	11.93	2.15	4.74	0.06	0.13	7.62	16.80
1987*	5.01	11.05	2.17	4.78	0.06	0.13	7.24	15.96

* Preliminary.

Sources: Fisheries Council of Canada, brief submitted to the Committee, 4 November 1986, p. 5; Department of Fisheries and Oceans, Economic Analysis and Statistics Division, 18 July 1989.

TABLE 18

QUANTITY AND VALUE OF CANADIAN FISHERY IMPORTS BY PRODUCT TYPES, 1985-1987

Product	1985 Quantity (Tonnes)	1985 Value ($'000)	1986 Quantity (Tonnes)	1986 Value ($'000)	1987 Quantity (Tonnes)	1987 Value ($'000)
Fresh/Frozen						
Seafish	51,733	122,076	56,206	154,934	67,157	172,101
Shellfish	26,957	218,556	29,678	269,807	29,557	283,242
Freshwater fish	2,487	8,374	3,130	10,695	3,179	11,631
Steaks and blocks	5,369	14,351	6,250	21,334	7,995	28,941
SUB-TOTAL	86,546	363,357	95,264	456,770	107,888	495,915
Smoked	382	1,855	450	2,546	427	2,223
Salted or dried	1,518	5,614	1,278	5,212	1,197	5,957
Cured or pickled	410	681	410	620	457	905
Canned						
Seafish[1]	16,308	71,663	21,188	91,978	26,428	117,206
Shellfish	8,868	42,114	9,167	42,640	9,900	52,810
Meal	742	193	2,994	1,323	4,334	1,941
Oil	359	620	468	880	583	2,308
Other seafish products	5,802	8,227	6,129	12,967	7,626	16,012
Other shellfish products	14,855	1,509	15,023	1,539	17,927	1,536
TOTAL	135,789	495,832	152,371	616,441	176,769	696,813

[1] Quantities exclude canned anchovy and sardine, which are reported in number of boxes.

Sources: Department of Fisheries and Oceans, *Canadian Fisheries — Statistical Highlights 1985*, p. 24-25; *Canadian Fisheries Statistical Highlights 1987*, p. 26-27.

Imports to Canada are of particular interest since a certain but as yet undetermined amount is of domestic origin. Canadian seafood producers on the East Coast, especially those dealing in fresh fish, apparently find it more convenient and lucrative to ship their production to large buyers in the northeastern United States (e.g., Boston), leaving Canadian retailers and wholesalers to obtain their supplies from American seafood brokers.[1] Canadians are also importing products not produced domestically, such as warm-water shrimp and prawns, the imported value of which went from about $91 million in 1982 to $163 million in 1987.

Equipment manufacturers are now producing store counters especially designed for holding fresh fish on ice, and which replace the converted meat counters using refrigeration which tended to dry out the product. As well, Canadian supermarket chains have started to develop major fish marketing schemes. Even so, the evidence suggests that for domestic sales of fresh seafood, Canada actually lags behind the United States.[2] The frozen retail segment in Canada, on the other hand, of which two-thirds is dominated by one company (National Sea Products), may be more developed in terms of sales and the range of products available to consumers.

TABLE 19

QUANTITY AND VALUE OF CANADIAN FISHERY IMPORTS BY SOURCE, 1985-1987

	1985		1986		1987	
Source	Quantity (Tonnes)	Value ($'000)	Quantity (Tonnes)	Value ($'000)	Quantity (Tonnes)	Value ($'000)
United States	80,569	266,416	91,986	311,585	114,094	364,655
European Community	10,419	39,606	13,907	50,559	8,591	41,348
Other European countries	4,721	10,462	3,100	9,474	2,143	8,583
Central and South America	9,730	47,927	4,507	43,350	6,624	61,181
Japan	9,452	36,401	8,276	45,156	7,173	40,028
All other countries	20,898	95,020	30,595	156,316	38,143	181,018
TOTAL[1]	135,789	495,832	152,371	616,441	176,769	696,813

[1] Quantities exclude canned anchovy and sardine which are reported in number of boxes.

Source: Department of Fisheries and Oceans, *Canadian Fisheries — International Trade, December 1987*, Vol. 9, No. 12, March 1988, p. 4; *Canadian Fisheries Statistical Highlights 1987*, p. 26-27.

[1] An analysis of the 1986 groundfish production and shipments indicates that virtually all sales of fresh and frozen groundfish fillets and blocks were exported, leaving none for the domestic market. How much of these were actually imported back to Canada is not accurately known.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 34.

JAPAN

Japan, the world's largest producer and consumer of seafood, is also the leading importer. A total of 2.4 million tonnes were shipped to that country in 1988, up 16.3% from the previous year. Japan consumes about 15% of the total world's supply of fishery products and harvests most of its requirements by employing a huge distant fishing fleet to supplement its domestic fishery. Domestic production of seafood gradually declined in the last decade due to reduced fishery allocations given to Japan by other countries with the extension of 200-mile limits. In order to maintain smooth fisheries relations with foreign countries and so ensure a stable supply, the Japanese have concluded agreements with a number of coastal nations for fishing operations in their waters. Canadian exports rose from $326 million in 1985 to about $480 million in 1987, and reached $603 million in 1988.

Changes in Japanese consumption patterns in recent years have resulted in decreased purchases of fresh fish and shellfish, while those of processed products are believed to have increased. Lower volume but higher value species appear to be gaining popularity, as seen by a decreasing per capita consumption (86 kilograms liveweight in 1980 down to 74.5 kilograms in 1984). Trends also indicate that consumer tastes are moving toward Western-type foods such as meat and dairy products, especially among Japanese youth, although the overall preference is still overwhelmingly in favour of fish. The Japanese are not only highly dependent on seafood as a source of protein, but also demand high quality.

Although Canadian exports of redfish to Japan have increased over the years, the prospects for shipping other species of groundfish have been limited because of import quotas and tariffs. The Japanese food industry, however, is showing growing interest in acquiring packaged or ready-to-sell seafood for their retail and food service markets. Mounting trade surpluses have apparently led the Japanese to liberalize their trade policies in this regard. It is noteworthy that Fishery Products International has recently introduced a line of groundfish products at the retail level in Japan, a first for the Canadian seafood industry.

The roe herring market in Japan is large and continues to be an important outlet for Atlantic herring producers. Exports of some $240 million in 1987 made Canada the largest supplier of this specialty seafood item.[1] The East Coast capelin fishery, which also focuses on roe, is a major supplier as well, although shipments to Japan have varied considerably, from a low of $11.7 million in 1980 to an estimated high of $60 million in 1988, mainly because of timing (Norway and Iceland, Canada's direct competitors in roe products, harvest capelin in the spring, while Canada harvests it in the summer).

The Japanese market for Atlantic crab has grown although resource recovery and increased landings in the Alaskan fisheries should result in stronger competition. In addition, the United States has also begun shipping lobsters to Japan, which could further reduce Canada's market share. Although Japan consumes mainly tropical species of shrimp and is in close proximity to China and Taiwan (the two largest producers of cultured tropical shrimp), exports of Canadian cold-water varieties show

[1] The prolonged illness and death of Emperor Hirohito meant that the Japanese ate less luxury imported seafood. This caused a noticeable decline in Canadian fishery exports to Japan, particularly herring roe, in late 1988 and in 1989.

promise for future growth.[1] The long-awaited return of squid on the East Coast could substantially boost future shellfish shipments to Japan, which is the world's largest squid market.

THE EUROPEAN COMMUNITY

Canadian groundfish producers have tended to serve as residual suppliers to the European Community because of preferential access given by the EC to Scandinavian producers and because of tariff barriers to trade. A decline in catches by EC member countries and increasing reliance on imports led to higher fish prices in 1987. In the United Kingdom, a major market for Canadian frozen groundfish, retail prices of fish rose by 11%, almost three times the average for food. Atlantic cod, the species of choice, was particularly affected and, as a result, the value of Canadian exports declined by about 85% between 1986 and 1987.

Canada exported approximately 19,000 tonnes of salted cod to Europe in 1987.[2] Due to very strong demand for fresh and frozen cod products, prices for the salted product forms in 1987 increased by more than 30% over 1986. Saltfish markets weakened considerably in 1988; high-priced inventories had to be sold at substantial losses as new production came into market at lower than 1987 prices. Major competitors are Iceland and Norway, and these countries have further strengthened their positions in the European Community. Norway concluded in 1988 a tariff-free agreement with the EC for additional shipments, while Iceland has begun processing saltfish in Britain to circumvent EC quotas and tariffs.

Although substantial inroads were made in the previously untapped food herring market in the second half of the 1970s when the North Sea and Baltic herring stocks collapsed,[3] Canadian producers were later edged out of the market when these recovered. European producers have since resumed exports of herring to the United States and the Caribbean to Canada's detriment. For the most part, Canadian frozen and canned herring has not been as competitive as that from Europe because of transportation costs and difficulties in market access.

Shipments of East Coast shellfish are mainly in lobster, and account for about 22% of Canada's total lobster exports. The market for live lobsters is a growth segment for the Canadian industry, increasing by about 130% from 1984 to some 2,250 tonnes in 1987.[4] Although shellfish exports have faced significant tariffs, these do not seem to have limited trade because of strong consumer demand.

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[1] The major import commodity is the shrimp/prawn/lobster group, accounting for over a quarter of the total import value of $U.S.10.9 billion in 1988.

[2] About 87% to Portugal and the remainder to Italy, Spain and France.

[3] The East Coast herring fishery had previously been directed to the production of oil and meal.

[4] The major European markets for live lobsters include France, the Netherlands, Belgium, West Germany and the United Kingdom. Department of Fisheries and Oceans, Letter to the Chairman of the Standing Senate Committee on Fisheries, 2 December 1988.

TRENDS IN WORLD FISHERIES

The preceding suggests that while Canada has been one of the world's most important seafood exporters, it certainly is not alone as a world supplier. Indeed, Canadian shipments made up only 7.5% of the total value of international trade in fish

TABLE 20

VALUE (IN MILLIONS $U.S.) OF FISHERIES TRADE BY SELECTED COUNTRIES, 1977, 1985-1987

	1977	1985	1986	1987
Exports				
Canada	762 (2)	1,359 (1)	1,752 (1)	2,092 (1)
United States	508 (6)	1,162 (2)	1,481 (2)	1,836 (2)
Denmark	629 (5)	953 (3)	1,381 (3)	1,751 (3)
Rep. of Korea	706 (3)	797 (6)	1,171 (5)	1,506 (4)
Norway	805 (1)	922 (4)	1,171 (4)	1,475 (5)
Thailand	177 (17)	675 (7)	1,012 (6)	1,261 (6)
Iceland	381 (7)	617 (8)	858 (8)	1,071 (7)
Netherlands	315 (8)	544 (9)	766 (9)	953 (8)
China	158 (18)	367 (13)	646 (10)	912 (9)
Japan	631 (4)	820 (5)	898 (7)	890 (10)
United Kingdom	197 (14)	362 (14)	511 (13)	718 (11)
France	151 (20)	359 (15)	501 (14)	654 (12)
Soviet Union	204 (12)	384 (11)	587 (11)	637 (13)
Chile	124 (23)	439 (10)	516 (12)	635 (14)
Mexico	193 (15)	378 (12)	457 (15)	570 (15)
Total World	9,416	17,327	23,057	28,076
Imports				
Japan	2,333 (1)	4,744 (1)	6,593 (1)	8,308 (1)
United States	2,086 (2)	4,052 (2)	4,749 (2)	5,662 (2)
France	655 (4)	1,040 (3)	1,510 (3)	2,022 (3)
Italy	425 (6)	985 (4)	1,264 (4)	1,738 (4)
United Kingdom	556 (5)	941 (5)	1,216 (5)	1,387 (5)
Spain	156 (14)	412 (8)	721 (7)	1,322 (6)
Fed. Rep. of Germany	666 (3)	820 (6)	1,113 (6)	1,270 (7)
Denmark	175 (13)	370 (9)	597 (9)	842 (8)
Hong Kong	215 (10)	472 (7)	624 (8)	794 (9)
Belgium	256 (8)	304 (12)	426 (11)	530 (10)
Canada	206 (11)	356 (10)	433 (10)	511 (11)
Netherlands	258 (7)	308 (11)	388 (12)	509 (12)
Portugal	88 (18)	202 (16)	257 (17)	425 (13)
Sweden	218 (9)	245 (13)	333 (13)	405 (14)
Switzerland	139 (15)	193 (17)	264 (15)	333 (15)
Total World	10,228	18,559	24,194	30,509

( ) World rank.

Note: The seven fishery commodity groups covered in this table include fresh, chilled or frozen fish; dried, salted or smoked fish; crustaceans and molluscs; fish products and preparations; crustacean and mollusc preparations; oils and fats from aquatic mammals; and meals, solubles, and similar animal foodstuffs of aquatic animal origin.

Source: United Nations, Food and Agriculture Organization, *Yearbook of Fishery Statistics, 1986 and 1987*, Vols. 63 and 65, Rome, 1988 and 1989.

products in 1987 (Table 20). Canada also ranked sixteenth in terms of catch, or about 1.6% of the global total (Table 21). The Canadian industry, therefore, has little power in world markets. The combined catches of Japan, the Soviet Union and China, on the other hand, accounted for approximately 35% of the world's total harvest.

Along with the extension of fisheries jurisdictions to 200 miles have come significant opportunities for coastal countries to reap the full benefit of the marine resources off their shores. Developing countries, in particular, are very much aware that fish has become a hard-currency-earning commodity.[1] The world harvest increased by 36.1% since 1977 to a record 92.69 million tonnes in 1987; about 72% of the total was used for food. [2] Although world markets have accordingly undergone important shifts in demand and supply during this period, world imports are still concentrated on a few developed countries.

TABLE 21

NOMINAL CATCHES (IN 000 TONNES) BY SELECTED COUNTRIES, 1977, 1985-1987

	1977	1985	1986	1987
Japan	10,128 (1)	11,409 (1)	11,976 (1)	11,841 (1)
Soviet Union	9,226 (2)	10,523 (2)	11,260 (2)	11,160 (2)
China	4,463 (3)	6,779 (3)	8,000 (3)	9,346 (3)
United States	2,980 (5)	4,765 (5)	4,943 (6)	5,736 (4)
Chile	1,317 (15)	4,804 (4)	5,572 (5)	4,814 (5)
Peru	2,503 (6)	4,136 (6)	5,614 (4)	4,584 (6)
India	2,311 (7)	2,824 (7)	2,922 (8)	2,893 (7)
Rep. of Korea	2,085 (9)	2,650 (8)	3,103 (7)	2,876 (8)
Indonesia	1,568 (11)	2,345 (9)	2,457 (10)	2,610 (9)
Thailand	2,189 (8)	2,225 (10)	2,536 (9)	2,165 (10)
Philippines	1,509 (12)	1,865 (12)	1,916 (11)	1,989 (11)
Norway	3,407 (4)	2,119 (11)	1,898 (12)	1,929 (12)
Dem. P. Rep. Korea[1]	1,190 (17)	1,700 (14)	1,700 (14)	1,700 (13)
Denmark	1,806 (10)	1,762 (13)	1,848 (13)	1,696 (14)
Iceland	1,374 (14)	1,680 (15)	1,657 (15)	1,633 (15)
Canada	1,235 (16)	1,418 (17)	1,507 (16)	1,453 (16)
Mexico	514 (27)	1,226 (18)	1,305 (18)	1,419 (17)
Spain	1,389 (13)	1,483 (16)	1,434 (17)	1,393 (18)
South Africa	541 (24)	601 (28)	629 (27)	902 (19)
Viet Nam[1]	588 (23)	808 (22)	825 (22)	871 (20)
Total World[1]	68,076	85,988	92,349	92,693

[1] Estimates.

( ) World rank.

Source: United Nations, Food and Agriculture Organization, *Yearbook of Fishery Statistics, 1986 and 1987*, Vols. 62 and 64, Rome, 1988 and 1989.

[1] "Can the U.S. Adjust to Being the World's Largest Fish Exporter?" *Seafood Business*, Vol. 7, No. 4, July/August 1988, p. 35. Developing nations now account for about 45% of world export value, up from 38% ten years ago.

[2] In terms of disposition, 19.7% of the catch destined for human consumption was cured, 17.3% was canned, 32.9% was frozen and 30.0% was marketed fresh. About 28% of the total catch was processed into non-food items such as meal and oil. Peru and Chile have traditionally been the world's leading producers of fish meal.

By the end of the next decade, the world's population is expected to reach 6.1 billion.[1] Even if global consumption were to remain at the 1987 level (18.55 kilograms liveweight per person), total landings of some 113.18 million tonnes, or an increase of 21 million tonnes over the current harvest, would be required by the year 2000. Given that many scientists believe that the world harvest already exceeds the critical point at which species can be replenished, it is highly unlikely that the world supply of food fish from natural freshwater and marine waters will ever be sufficient to match the increase in demand. Resource economists assert that most major stocks of familiar fish have either been fully exploited or are being excessively harvested and that "the growth era in fisheries is over."[2] Accessing or creating supply will therefore pose the greatest challenge of the world's fish producers in the 21st century.

In this regard, marine and freshwater aquaculture, an old tradition in many countries, is showing the potential to increase the world's seafood supply and relieve increasing pressures on wild stocks. This sector's output is estimated in 1988 to have reached 12% of the world's fish harvest,[3] with Asia accounting for over 80%.[4] The extraordinary growth in China's production since 1977 can in fact be attributed to aquaculture in that country.

Besides the steady rise in demand for fish products along with corresponding price increases, and aquaculture's continuity of supply, consistency of quality, and control over production (e.g., size, flesh colour, fat content, etc.), the growth of this activity has been spurred by scientific and technological advances in nutrition, disease control and genetics. Although shellfish are particularly popular, the types of fish cultivated around the world cover an increasingly broader range of species. Even "simple" species such as cod will increasingly enjoy attention with a view to establishing aquaculture production. In the long run, increasing supplies from fish farming, however, may further depress prices.

Future increases in world supply may be possible from species that are not yet normally caught for food, either because they are too difficult to catch and process or because they are unprofitable. Against this backdrop of falling or stabilizing world harvests, more research and development efforts will necessarily be directed to improving the yields obtained from harvested fish. Seafood producers facing declining catches will also by necessity focus on value addition (e.g., innovative product forms and convenient packaging), quality products and portion control. More attention will be devoted to marketing.

Finally, fish stocks throughout the world will continue to be threatened by overfishing as strong market pressures urge the industry to disregard conservation measures.[5] Some countries will mistakenly argue that some questions relating to the determination of TACs and arrangements for access to surpluses within 200-mile limits result in trade distortions.

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[1] Every three years the world must now accommodate an increase in population roughly equivalent to the present population of the United States and Canada.

[2] World Commission on Environment and Development, *Our Common Future*, Oxford University Press, New York, 1987, p. 266.

[3] Department of Fisheries and Oceans, *Commercial Aquaculture in Canada*, 1988, p. 1.

[4] *Ibid.*, p. 3.

[5] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 1, 14 November 1986, p. 13.

CHAPTER V

Conservation and Resource Management – Issues and Recommendations

AN OVERVIEW

> Marketing is a total process involving a number of issues. I hadn't thought of it that way, until you pointed it out. . . I was thinking of marketing as simply being advertising and beating the drum.
>
> *Proceedings*, 20 June 1988, p. 25

> We are doing some things right in Canada, because we still have some fish. But we certainly can learn a lot from what we have done.
>
> *Proceedings*, 11 May 1988, p. 21

> Crisis management or management crisis?
>
> *Proceedings*, 17 June 1988, p. 17

The fisheries challenge faced by government is to protect the resource and at the same time maximize the economic benefits for the people who harvest, process, sell and consume the fish. Since the industry's economic performance is very much linked to fisheries management, discussions about fishing, processing and marketing seafood in the course of the Committee's hearings often led to more fundamental issues affecting supply.

DFO was generally recognized as having done a good job in terms of conservation and resource management, especially when compared to the management regimes of other coastal countries, including the United States.[1] From 1977 to 1984, Canadian catch rates for Atlantic groundfish are believed to have doubled. For many, however, the unfortunate result of moving foreign fleets outside the 200-mile limit appears to have been a Canadian fishing effort just as capable of adversely affecting the resource.

[1] A statement which American fisheries scientists at the Woodshole Institute (Massachusetts) confirmed during a Committee tour of the facilities in March 1988.

For example, groundfish quotas in the Scotia-Fundy region (NAFO division 4VWX,5) decreased by 100,000 tonnes in the past six years; fishing capacity, on the other hand, is estimated to have the potential to exert four times the effort required to harvest at F0.1.[1]

Not only are there too many fishermen in relation to the available fish, or "too many fishermen chasing too few fish" (an often-used cliché) in virtually every fishery and too many fish plants to sustain reasonable returns for most of those involved, but the fleet now has at its disposal sophisticated fishing technologies, such as echo sounders that can find schools of fish and also show their size and species. Thus, it is possible to go after the very last fish in the ocean, just as it is possible to cut down the very last tree in a forest.

In fact, many groups and individuals repeatedly warned the Committee that the fishery was at an important crossroads, and that unless fisheries management issues are addressed more intensively and comprehensively, the industry would soon be in very serious trouble.

The evidence leaves little doubt that resource conservation and effective management must be reaffirmed as a primary objective of fisheries policy. A host of regulations already control fishing activities in Canadian waters. Although these are a source of much friction between the industry and government, the common property nature of the fishery resource dictates that its exploitation cannot be left solely to the whim of fishing concerns, whether domestic or foreign.

THE MEECH LAKE ACCORD

> Given the proper circumstances and the right combination of personalities, it is certainly possible to see a day where an agreement could be struck that would see fisheries jurisdiction handed over to the provincial governments. If that were ever to happen, the entire fishery would be thrown into utter chaos. Basically, it would amount to having five separate St. Pierre-Miquelon disputes going on at the same time. In the end, there would be no winners, we would all lose.
>
> *Proceedings*, 9 May 1988, p. 69

The federal government carries the jurisdictional responsibility for conserving the fishery resource and for its allocation among competing users. The 1987 Constitutional Accord (also known as the Meech Lake Accord) states that:

> 50. (1) A constitutional conference composed of the Prime Minister of Canada and the first ministers of the provinces shall be convened by the Prime Minister of Canada at least once each year, commencing in 1988.
>
> (2) The conferences convened under subsection (1) shall have included on their agenda the following matters:
>
> (a) Senate reform, . . .
> (b) roles and responsibilities in relation to fisheries; and
> (c) such other matters as are agreed upon.[2]

---

[1] Groundfish Capacity Advisory Committee, *Report*, 10 November 1988. The number of fish plants in the region are also said to have doubled, from 193 in 1978 to 374 in 1988.

[2] *The 1987 Constitutional Accord*, Appendix II, Part VI, Constitutional Conferences.

For some, section 50(2)(b) suggests that changes in fisheries jurisdiction would be appropriate. Under a system of shared jurisdiction, the federal government would be responsible for fisheries research and would set overall TACs, but the provinces would divide the total among themselves and would have the authority to approve the harvesting plans of fish companies.

Almost without exception, witnesses who chose to speak on the issue opposed the idea of increasing provincial control over licensing and fish allocation. Their opposition was based on the belief that in the wake of shared jurisdiction there would be a race among the provinces to maximize employment opportunities within their own territories at each others' expense. Moreover, since fish processing is under provincial jurisdiction, it was felt that an annual and permanent constitutional discussion of the "roles and responsibilities" with respect to fisheries would fuel the conflicts that already exist between provinces, fishermen and processors, and would inject uncertainty into the planning environment for fishermen and processors alike, inhibit new investment, and weaken Canada's international competitiveness.

It was also feared that shared jurisdiction would compromise the effective management of stocks. Fishermen from several provinces often fish in common areas,[1] and it is conceivable that disagreements between the five Atlantic provinces and the federal government over quotas, licences and other matters might be settled by political compromise, such as increasing the overall quota, but at the expense of conservation. The resulting "balkanization" of the fishery into five separate sub-regions on the basis of political geography, would further reduce the economic potential of the industry by limiting the mobility fishermen need to adjust their harvesting patterns. Many drew the Committee's attention to the fact that fish not only migrate between the waters adjacent to the various provinces; they also cross international boundaries and, therefore, a strong national authority is required.

In view of the near unanimity among witnesses and the strength of the arguments presented, it is the Committee's belief that shared jurisdiction would not be in the interests of the Canadian fishing industry.

Although matters relating to fisheries conservation and management, including authority in the area of fish habitats, should be left in federal hands, the Committee recognizes the need for a more structured form of consultation and cooperation between federal and provincial governments, especially regarding socio-economic matters. It therefore recommends:

(1) That should the 1987 Constitutional Accord be ratified, consideration be given to amending the Constitution of Canada by moving the subject of fisheries from the agenda of the constitutional meetings to the agenda of the annual conferences of the first ministers on the economy.

[1] For example, five provinces border on the Gulf of St. Lawrence.

FISH HABITAT

> Fish don't like dirty habitats any more than humans do. They disappear or die. We can all draw our own conclusions on that.
>
> *Proceedings*, 24 May 1988, p. 12

> The reality is that the filth in the ocean is not something that we can deny. It is a very serious situation to which I do not have a solution. Fortunately, our seafood comes from much cleaner water than others.
>
> *Proceedings*, 14 September 1988, p. 17

Conservation in modern fisheries management is generally understood to apply not only to fish, but also to their habitats (i.e., the aquatic environment). In Canada, the Department of the Environment is responsible for environmental protection as it relates to pollution risks associated with offshore fuel and mineral resources exploitation, industrial discharges from land-based industries, ocean dumping and vessel wastes. It also has an advisory role in such areas as environmental emergencies, shellfish protection, and the effects of land-based pollutants. North of 60° latitude, the Canada Oil and Gas Lands Administration (COGLA) assumes environmental protection with regard to oil and gas activities offshore and on land, and the Department of Indian Affairs and Northern Development is responsible for the protection of Arctic marine waters as it relates to the disposal of non-ship-derived waste.[1] DFO administers those sections of the *Fisheries Act* dealing with fish habitats; this involves reviewing development proposals which might have detrimental effects on these. As well, scientific research is aimed at habitat conservation, restoration and development.

Public opinion polls clearly show that Canadians as never before are focusing their attention on the state of the environment.[2] So far, the problem of acid rain, which has contributed to the disappearance of salmon from many East Coast rivers and the destruction of at least 14,000 lakes from Ontario to Newfoundland, has drawn much public attention. Recent news reports have detailed the devastation of the beluga whale population in the St. Lawrence River, which some witnesses before this Committee likened to a dump for the waste products of northeastern North American industries.[3] In this regard, the Committee learned that fish livers in certain areas of the Gulf are contaminated with PCBs.[4] It was also pointed out that much of the municipal waste on the East Coast, such as raw sewage, is being dumped into the water, a difficult problem to solve because of the limited resources of municipal governments.[5]

In the United States, the more serious problem of marine pollution has even had, to some extent, an adverse impact on seafood consumption. In regions where negative

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[1] The Canadian Coast Guard is the lead agency during marine emergencies, including the cleaning-up of ship source pollution.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 17.

[3] *Ibid.*, Issue No. 25, 3 February 1988, p. 28.

[4] *Ibid.*, Issue No. 24, 2 February 1988, p. 35.

[5] *Ibid.*, Issue No. 34, 11 May 1988, p. 56.

reports received the most attention, consumption noticeably declined in 1988. One witness made the following observation:

> About a month ago, there was a front page article in *Time* magazine on filth in the sea. Last week there was a full-page advertisement in the *New York Times* showing a fish with a hypodermic needle in its mouth and it talked about the garbage that was being washed up. A campaign has been instigated which is not unlike the seal campaign. It emphasizes the filth in the ocean and asks for donations.
>
> Consumers do turn on or off seafood. New York is in a situation right now where its fresh seafood consumption is down by 50 per cent.
>
> I think that what is happening in terms of the environment and the sea may be far more serious than anything that happened respecting mussels.[1]

On another front, concerns have been expressed about the offshore oil and gas development and its possible effects on the fishery. It is estimated that the East Coast offshore alone holds 30% of Canada's oil potential and 17% of its gas potential. The ocean holds forth exciting economic promise beyond its biological riches. A number of questions have surfaced, however, such as whether fishing vessels will be physically obstructed by rigs and production platforms, pipelines and related shipping activities. Fishermen wonder whether their gear might be affected by oil-related debris and seafloor installations, and whether there will be onshore competition between the fishing and energy industries for wharf and docking space or a significant shift of skilled manpower away from the fishing industry.

In the opinion of some experts, the effects on the ecosystem of an accident such as a large spill or blowout could be disastrous, reducing the productivity of fish stocks or triggering changes in their migratory patterns. It can also be pointed out that even a suspicion of oil contamination or tainting of seafood could have dire consequences on markets. Others discount these concerns, referring to other parts of the world where accidents have occurred and where there have been no long-lasting effects on the environment.[2]

Although the odds against accidents are great, no one can affirm that offshore drilling brings absolutely no risk, especially given the severe climatic and oceanic conditions (i.e., frequent storms, high winds and ice movement) in which drill rigs often operate. For environmental and fishing groups, the concerns in relation to gas and oil development on Georges Bank, the site of the most prolific scallop bed on the continent and one of the world's most productive fishing grounds, are particularly grave. The Committee learned that the unique characteristics which make the Bank a valuable fishing and spawning ground — its large circular current, or gyre, which retains nutrients and enables the spawn of many species of fish to grow — could also make it extremely vulnerable to pollution. In response to opposition by fishermen, the Canadian federal government has recently banned oil exploration in this area until at least the year 2000.[3]

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(1) *Ibid.*, Issue No. 50, 14 September 1988, p. 17.

(2) *Ibid.*, Issue No. 47, 20 June 1988, p. 103.

(3) Test wells have been drilled on the American side of the boundary line on Georges Bank, but nothing has so far been found.

Just as there is no absolute guarantee that all accidents can be avoided, it is also true that not all damage to the environment, the resource or even the way of life can be subject to compensation. In this regard, one witness suggested that the offshore oil and gas industry should at the very least, bear the risk by insuring their operations against the eventuality of an accident (a worse case scenario).[1] What seems to be contradictory scientific evidence makes the issue of "fish versus oil" very much open to debate and worthy of further serious study and consideration. We must remind ourselves of the immense difference between the renewable fishery resource and non-renewable hydrocarbon resource; the fishery can continue to replenish itself for future generations.

Federal and provincial governments have recently taken important steps to deal with environmental problems, such as undertaking a cleanup of the St. Lawrence River and Halifax Harbour. A National Marine Council has been established to advise the Minister of Fisheries and Oceans on ocean-related policies. A new policy for the management of fish habitats released by DFO in October 1986 has as its overall objective a "net gain" in habitat productivity through habitat conservation, restoration and development. Fundamental to this policy is the "no net loss" principle, under which DFO compensates for unavoidable habitat losses with habitat replacement on a project-by-project basis.[2] In June 1988, the *Canadian Environmental Protection Act* received Royal Assent. This Act requires industries to test and evaluate new chemicals for environmental or human hazards before they are introduced into the Canadian market, sets new fines and jail terms against violators and gives the government the authority to identify and regulate toxic substances already present in the environment.

The Committee is aware that it may not always be possible to halt all industrial development that promises economic benefits, yet it recognizes that fish habitats and the environment which sustains the fishery resource are the basis for a sound industry. It is also aware that habitat rehabilitation and replacement are not always possible, and that some aspects of environmental degradation, such as acid rain, ozone depletion and global warming (which may change water temperatures), demand agreement and, above all, prompt action at the international level. Environmentally, Canada must be much tougher. The Committee recommends:

(2) That the federal government give higher priority to controlling and reducing all forms of pollution. The responsible federal departments should vigorously promote bilateral and international initiatives to control and prevent freshwater and marine pollution. Federal regulations should be strictly enforced and polluters prosecuted. More stringent laws and regulations must be enacted;

(3) That the Department of Fisheries and Oceans expand and strengthen its research programs on fish habitat in the region. In applying the "no net loss" principle in pursuing its habitat policy, the Department should disallow developments which impinge on fish habitats unless it can be shown, after extensive public input, that such developments are clearly in the interest of Canada.

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 19.

[2] Department of Fisheries and Oceans, *Policy for the Management of Fish Habitat*, Supply and Services Canada, October 1986, p. 12-15.

THE GROWING SEAL POPULATION AND ITS EFFECTS ON THE FISHERY

> The reality of it is that seals are looked upon with almost more love and affection than children. . . However, that is the way of the world.
>
> *Proceedings*, 14 September 1988, p. 21

> I can assure you that these decisions were not taken lightly and were based on the best available scientific advice.
>
> *Proceedings*, 26 April 1988, p. 8

Since the mid-1960s, the Canadian sealing industry has been the subject of widespread controversy as animal rights groups have mounted well-funded campaigns to end this centuries-old industry. From attempts to disrupt the seal hunt by clashing with sealers on the ice floes to depicting Canadian sealers in the media as brutish people who hunt to satisfy a dark lust to kill, the anti-sealing lobby has been successful enough to persuade the European Community to ban, in 1983, the import of raw, tanned or dressed skins of pups of harp seals (whitecoats) and hooded seals (bluebacks).[1] The issue eventually spread to other Canadian exports as well; for example, a large supermarket chain in Britain decided not to stock Canadian canned salmon as a protest against the seal hunt.

The story about the seal hunt has grown to include a number of falsehoods, for example that seals are in imminent danger of becoming extinct. The Committee learned that a recent anti-sealing campaign launched by the Massachusetts-based International Wildlife Coalition tried to persuade American tourists in Canada to wear orange bathing caps in 1987, on the grounds that rifle-toting fishermen make it dangerous to visit Nova Scotia beaches.[2] While some animal welfare groups may be involved in promoting the protection of species which are truly endangered (which seals are not), others have vested interests in propelling the issue into media grandstanding that extends far beyond the interests of the seals themselves: for some groups, participation in the "Save the Seals" movement is undoubtedly a proven fundraiser.[3]

Six species of seals (the bearded, the grey, the harbour, the ringed, the harp and the hooded) are found on the East Coast. Commercial sealing has always been an important activity for the native peoples of the north, and in many areas there is often no practical, acceptable substitute for seal meat in their diets. On the East Coast, the harp and hooded seal have comprised the bulk of the animals taken during the annual hunt held in the early spring primarily along the northeast coast of Newfoundland ("the Front"), in the Gulf of St. Lawrence off the Magdalen Islands, and along the north shore of Quebec. Historically, there have been two main harvesting components: the large, company-owned vessels greater than 150 tonnes and longer than 20 metres, which harvested during the season at the Front and in the Gulf, and the landsmen hunt carried out by individual fishermen who ventured to the ice on foot, in small boats and longliners closer to shore.

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[1] The United States market has also been effectively closed since the passage of the *Marine Mammal Protection Act* in 1972.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 39, 24 May 1988, p. 103.

[3] *Ibid.*, p. 98.

Although the direct economic benefits from commercial sealing have been small compared with the total economic output of the Atlantic provinces, because of few alternative employment opportunities in some areas, the benefits to sealers have been much more significant than a narrow assessment might indicate; in a number of small communities, the seal hunt took place when many fishermen had exhausted their unemployment insurance entitlements or were close to doing so.

The Newfoundland seal hunt lands most of the seals on the East Coast. Prior to 1982, most landings were used mainly for the fur, but since the European ban, there seems no likelihood of any significant market recovery over the next few years in western Europe, traditionally the largest market for sealskins. The Canadian market has been mostly in the footwear and souvenir industries. Currently, there appears to be no Canadian market for fashion garments using sealskins.[1]

In 1984, the federal government established a Royal Commission on Seals and Sealing, made up of a number of distinguished foreign experts and chaired by Judge Albert Malouf, to inquire into and make recommendations on all aspects of seals and sealing in Canada, including the social, cultural, ethical, scientific, economic, resource management and international implications. A total of some 156 witnesses gave testimony and a further 137 written briefs were received by the Commission. A report (known as the Malouf Report) was released on 17 December 1986. It found that the Canadian seal hunt was well-regulated, provided major social, cultural and nutritional benefits to many communities, was an important source of income to these where few employment alternatives existed, did not endanger seal populations, and was humanely conducted — probably involving less suffering to the animals than did many forms of slaughtering domestic animals.

The Malouf Commission noted that there had been a 20-year "skilled political lobbying" campaign by groups opposed to commercial seal hunting, warned that it would be "unrealistic" to revive the hunt for very young seals, and recommended that it not be permitted. The Commission proposed that the federal government provide $120 million worth of financial assistance to the Inuit hunters and commercial sealers most affected by the European ban on seal products to revitalize a small-scale landsmen's hunt, develop new products from seal pelts and meat, pinpoint markets and compensate sealers for lost income.[2]

In a preliminary response to the major recommendations of the Malouf Report, the federal government stated in December 1986 that the government's priority was to encourage the sealing community "to chart its own future." To this end, DFO announced funding of $150,000 to the Canadian Sealers' Association, with the Department of Indian and Northern Affairs contributing $150,000 to the Inuit Tapirisat of Canada, to develop their own strategies. Overall, $5 million over four years was earmarked for the sealing industry to use for labour adjustment, marketing and industrial development programs; thus, the Malouf Report's proposal for a $120 million compensation package was rejected.

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[1] *Ibid.*, Issue No. 29, 15 March 1988, p. 16.

[2] Royal Commission on Seals and the Sealing Industry in Canada, *Seals and Sealing in Canada*, Supply and Services Canada, 1986, Recommendations 14, 17 and 18.

Under a new sealing policy announced in December 1987, which witnesses before this Committee variously described as a "farce," a "sham" and a "shame," the large vessel offshore seal hunt in Canadian waters ended, as did all commercial hunting of whitecoat harp seals and blueback hooded seals. The annual harvest of older seals by Inuit and other coastal people was expected to continue, while the netting of seals was to be phased out over five years except for traditional hunts north of 53° latitude. In January 1988, a report by the Fisheries and Oceans Research Advisory Council (FORAC) recommended against an annual cull of grey seals stating that current scientific knowledge did not justify it.

The federal government's handling of the seal issue was the subject of much criticism during the Committee's hearings on the East Coast. It would be an understatement to say that the rising population of grey seals, in particular, arouses strong feelings among fishermen who clearly see the growth of these stocks as a threat to their livelihood.

Although apparently hunted to very low levels by the end of the 19th century, the grey seal (also known as "horsehead," "hopper," "hodge" and "cowmore") has not been commercially exploited in the 20th century and has very few natural predators. Culling was carried out yearly between 1967 and 1983, but the numbers involved in culls, scientific research and bounty activities have been small.[1] The population has been estimated at anywhere between 70,000[2] and 100,000,[3] with the animals breeding on Sable Island, where conditions are favourable for counting, increasing at a rate of 13% to 14% annually.

It is a widely accepted theory that the significant rise in recent years in the number of fish with parasitic worms is due to the booming population of grey seals.[4] Once found only in cod and salmon, nematode parasites (*Pseudoterranova decipiens*, also known as sealworms or codworms) are now being found in haddock, yellowtail flounder, plaice and other commercially important species of fish and are being detected in areas where they have not been found before. It should, however, be noted at the outset that they are a purely esthetic problem and do not pose a health risk to consumers.

Although it is known that seals, especially grey seals, are the essential vector in the life-cycle of nematodes that commonly occur in the flesh of fish, FORAC maintained that there was no proof of a direct relationship between the number of grey seals and the parasite burden in fish. The Malouf Commission, on the other hand, noted that there were "strong correlations between areas of high-density seals, especially grey seals, and infection rates in fish" in that "during the last 30 to 40 years there have been parallel trends of increasing numbers of grey seals and rates of parasite infection."[5] The Commission in fact concluded that grey seals are the major culprits when it comes to this particular problem and stated the following:

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(1) *Ibid.*, Vol. 3, p. 144.

(2) The Malouf Commission in 1986 believed the number to be between 40,000 and 70,000, with the upper part of this range being more probable.

(3) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 21.

(4) *Ibid.*, Issue No. 25, 4 February 1988, p. 150.

(5) Royal Commission on Seals and the Sealing Industry in Canada (1986), Vol. 3, p. 443.

> Though the dynamics of the. . .fish-seal system are not well-understood, it is highly likely that increased numbers of seals will result in increased infection, and increased infection will result in increased losses, possibly including increases in the extent of the areas in which commercial fishing for the fresh fish trade for some species is impracticable. Grey seal numbers are increasing, and this is likely to increase losses above the present level.
>
> There is no sure way, with present knowledge, to reduce the rate of infection. It is possible that changing the abundance or the size and age composition of the fish populations, or actions aimed at other intermediate hosts might be effective. On present evidence, however, the measure offering the best chance of success would be to reduce the number of seals, especially grey seals. A considerable reduction in seal numbers would probably be needed before any demonstrable effect could be observed. . .[1]

Since the presence of nematodes makes fillets unappealing to consumers, processors must visually examine them under a light source, a process known as candling, after which they are meticulously removed with a knife. In some areas of the East Coast where the problem is particularly acute, fish is often rejected for filleting because the process is too costly. Large fillets that are highly infected are sometimes thin-sliced, a practice which downgrades the final product. In addition to lost yields, trimming and candling may lead to bottlenecks in fish plants, and this in turn affects plant capacity, lengthens processing time and increases operating costs. While the Malouf Commission estimated in 1986 that such losses amounted to at least $30 million annually, one witness who testified before the Committee estimated the total to be closer to between $50 million and $60 million.[2]

The Committee also heard numerous complaints by inshore fishermen and aquaculturists about the damage seals cause to fishing operations. Malouf estimated these cost the industry more than $2 million per year, but one witness believed the cost to be closer to $10 million.[3] These losses result from fish being damaged or removed completely from the catch; fish and bait that are removed from traps; physical damage done to the gear and subsequent loss of fish; time lost from fishing to repair the damage; catches lost because fishing gear is not being used; time spent patrolling to keep seals away from nets and aquaculture sites; and modifications to gear or fishing practices to reduce seal damage.[4]

Seals feed mainly on whatever fish or shellfish are most abundant in the place where they are living, including a substantial amount of commercial species which would otherwise be available to fishermen.[5] The scientific evidence suggests that the total food consumption of seal populations is about 6% of bodyweight per day for smaller animals and 5% and 4% for larger species. In the Northwest Atlantic Ocean, it was estimated in 1986 that some 5.26 million tonnes of a wide variety of fish, crustaceans and molluscs were consumed by seals,[6] a phenomenal amount which would make them the world's third largest consumer of marine fish after Japan and the Soviet Union.

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(1) *Ibid.*, p. 444.

(2) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 22.

(3) *Ibid.*, p. 21.

(4) Royal Commission on Seals and the Sealing Industry in Canada (1986), Vol. 3, p. 373.

(5) The catch, however, is perhaps not reduced by exactly the amount consumed.

(6) Royal Commission on Seals and the Sealing Industry in Canada (1986), Vol. 3, p. 301.

For grey seals, which can live up to 40 years, fish consumption was estimated in 1986 at 240,000 tonnes yearly. Between 60% and 90% of what they consume are commercially important species such as cod, herring, flounder and possibly Atlantic salmon; their intake was estimated to cost the fishery between $30 million and $84 million.[1]

In sum, seals, especially grey seals, are detrimental to fishing interests for three major reasons: competition for fish, nematode contamination, and damage to gear and catches (Table 22). Although losses are not accurately known, the grey seal population is grave and becomes even more so when one considers the havoc wreaked on the fishery by all seals combined.

DFO has undertaken a scientific research program to find alternative ways (such as fertility control and parasite control with the use of vermicides) of controlling the grey seal population. Research is also being directed to finding a weak link in the nematode's life-cycle. Although there are no simple answers, from a fisheries standpoint the most effective form of population control would be a cull or selective hunt. Since the method of slaughter has been the most protested element of the hunt, this could be changed; for example, live seals could be taken from the ice floes and brought ashore to enclosed abattoirs as is done in the Soviet Union[2] and for other types of livestock.

Inshore fishermen favour a cull, but senior management of fish processing companies are deeply worried about a market backlash. The Committee suspects that the federal government decided against a cull largely to appease the anti-sealing lobby, fearing adverse publicity which might affect Canadian exports abroad.

TABLE 22

ESTIMATED AVERAGE ANNUAL COSTS PER SEAL, 1986

	Harp Seals	Grey Seals	Harbour Seals
Annual Costs ($ million)			
Parasites %	1%	98%	1%
(% of $30 million)	0.3	29	0.3
Damage %	5%	80%	15%
(% of $2 million)	0.1	1.6	0.3
Competition for Fish	23 – 75	30 – 84	1.6 – 3.7
Total Cost	23 – 75	61 – 115	2.2 – 4.3
Population	2×10^6	70×10^3	13×10^3
Annual Cost/Seal ($)	12 – 38	900 – 1,600	170 – 330

Source: Royal Commisson on Seals and the Sealing Industry in Canada, *Seals and Sealing in Canada*, Vol. 3, Supply and Services Canada, 1986, Table 29.2, p. 549.

[1] *Ibid.*, p. 296, 298, 308.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 25, 4 February 1988, p. 136.

The campaigns waged against the sealing industry in Canada have committed a grave injustice against sealers and have been grossly unfair to the people of communities who have traditionally depended on the industry for their livelihood. Public attitudes to seals and sealing in Canada and abroad are largely based on incomplete, erroneous and distorted information about the hunt, seal herds and their numbers.

Since no other information is being given the same publicity in the media, it is widely assumed that there is no moral, humane or economic justification for sealing or undertaking a cull; yet seals are a renewable natural resource, and a fishery resource under the *Fisheries Act*, whose management is fully in step with the aspirations of an ecologically conscious world. Since the issue falls under federal jurisdiction, the onus is on the federal government to put forward a strong case for the defence of the fishing industry. To quote one witness, "There has to be a skilled presentation of this side of the story."[1]

With respect to the foregoing, and given the importance of fishing and sealing to the economic and general welfare of the people on the East Coast, the Committee recommends:

(4) That the Department of Fisheries and Oceans substantially increase the level of funding for research on new methods of fertility control in seals. If a solution to the grey seal problem is not forthcoming within two years, the federal government should proceed with a cull in accordance with the recommendations put forward in the Report of the Royal Commission on Seals and Sealing in Canada. Meanwhile, a substantial research effort should be undertaken to: (a) assess the population and growth rate of seal stocks and document precisely the losses incurred by the fishing industry due to seals so as to produce irrefutable evidence to show that a cull is necessary; and (b) determine the magnitude of a cull needed to reduce the nematode burden in fish;

(5) That government and industry consider jointly planning and funding an aggressive and direct public relations campaign aimed at countering any future boycotts of Canadian products at home or abroad resulting from the seal management issue.

FOREIGN OVERFISHING

> These negotiations are highly political in nature because the stakes are very high for both Canada and France, especially for France, because this is its last chance to negotiate permanent access. And I think you know what that means.
>
> *Proceedings*, 17 June 1988, p. 27

> The Flemish Cap is overfished so much that it has now become a Flemish hole and the tail and nose of the Grand Bank are very little different.
>
> *Proceedings*, 11 May 1988, p. 104

[1] *Ibid.*, Issue No. 39, 24 May 1988, p. 100.

> This problem has reached that kind of a priority level where the government and other ministers must support the Minister of Fisheries... Let's get this problem broadly aired, let us make the senior members of government, External Affairs, Finance, and the Prime Minister himself, absolutely aware of it; and let us get it on their list of objectives so that every time they are meeting with France, Brussels, South Korea, or even Washington, fish is not a non-issue in those discussions.
>
> *Proceedings*, 5 March 1987, p. 17

> We fishermen are not all too familiar with all this foreign policy stuff, but I am sure that we could rattle some cages if Canada had the political will to do so.
>
> *Proceedings*, 24 May 1988, p. 167

The problem of foreign overfishing in Canadian waters might have ceased with the gradual phasing out of fishing vessels from other countries since 1977, yet foreign interests in the northwest Atlantic fishery remain strong. For many, the long-term viability of the Canadian fishery and the ecological integrity of the resource on the East Coast are being jeopardized, and the matter is reaching crisis proportions.

First, the declaration of extended jurisdictions created two boundary disputes — one with the United States in the Georges Bank/Gulf of Maine area (resolved by reference to the International Court of Justice in the Hague in 1984) and one with France, which claims a 200-mile economic zone around the Islands of St. Pierre and Miquelon off the southern coast of Newfoundland.[1] This last issue is one which seems to have been largely unforeseen in 1977, but which has since become an ongoing irritant for all concerned. A recent NAFO study showed the need for a reduction in fishing in area 3Ps, in order to rebuild and stabilize cod stocks depleted through excessive and uncontrolled harvesting by the St. Pierre and French metropolitan dragger fleets. The Committee was told that France may have exceeded by four times its assigned quota in 3Ps, a particularly critical area to Newfoundland inshore fishermen.[2]

The resolution of this dispute now depends on international adjudication: as part of an arrangement to have France agree to take the matter to an international tribunal, Canada reluctantly allocated Canadian stocks to that country over the next three years, at the end of which time it is hoped that a ruling will be made. Understandably, these allocations, announced in March 1989 at a time when Canadian fishermen were being asked to reduce their catches, created strong resentment among Canadian fishermen and fish plant workers.

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[1] France also claims the right of fishing vessels based in France to fish in Canadian waters.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 39, 24 May 1988, p. 29.

A second problem is the foreign overfishing by fleets on the Continental Shelf just beyond the 200-mile limit, with the heaviest concentration of foreign vessels located mainly on three productive fishing areas, namely the "nose" and "tail" of the Grand Banks, and the Flemish Cap.[1] In these areas where Canada has no jurisdiction,[2] significant fishery resources are being depleted so as to undermine Canada's fisheries management effort. Fish stocks which "straddle" the maritime boundary are of the utmost importance to the Canadian fishing industry, especially in the wake of the northern cod controversy.

A number of witnesses argued that NAFO had become a dismal failure in curbing the problem outside Canadian jurisdiction because surveillance and enforcement is weak and compliance is voluntary. Any member country can systematically flout the quotas set by filing an objection. By Canada's reckoning, in 1986 the EC ignored its quota of 23,260 tonnes, unilaterally set it at 102,460 tonnes, and proceeded to harvest 172,183 tonnes of various species of groundfish.[3] In 1987, the Community set its quota at 110,300 tonnes or 87,130 tonnes more than the recommended level, and took 140,842 tonnes. Last year, NAFO reduced the EC quota to 19,010 tonnes; the Community, however, raised it 163,400 tonnes but found that its fleet could catch only 66,395 tonnes. In December 1988, the EC established a unilateral quota of 157,890 tonnes for 1989, an amount more than 12 times that recommended by NAFO. Moreover, there are some countries fishing in the area, such as the United States, Mexico, South Korea and Panama, which do not belong to NAFO and which fish with little or no regard for conservation.[4]

Over the years, Canada has relied mainly on persuasion and allocating surplus fish stocks to foreign fleets within the Canadian zone in return for cooperation in conservation outside the zone. As a result, some countries, such as the Soviet Union, have not exceeded their quotas on transboundary stocks. This bilateral approach, however, has not been entirely successful:[5] for countries such as Spain and Portugal, which are notorious violators, there are no bilateral agreements in place.

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[1] *Ibid.*, Issue No. 15, 5 March 1987, p. 8. A picture is worth a thousand words. The cover of *Foreign Overfishing: A Strategy for Canada* (1987), published by the FCC, features a photograph of a DFO offshore fishing surveillance map taken in January 1987 which indicated at that time some 146 foreign fishing vessels within or just outside Canada's 200-mile zone.

[2] Under the *Fisheries Act*, TACs are set for all major "regulated" groundfish stocks within Canadian jurisdiction upon the scientific advice provided by CAFSAC, except for the following eight groundfish stocks: 3M and 3NO cod, 3M and 3LN redfish, 3LNO and 3M American plaice, 3LNO yellowtail, and 3NO witch, for which advice is provided by the Science Council of NAFO. Department of Fisheries and Oceans, *Enterprise Allocations for the Atlantic Offshore Groundfish Fisheries — 1988*, 20 May 1988, p. 3.

[3] Figures include 2J3KL, 3M and 3NO cod; 3M and 3LN redfish; 3M and 3LNO American plaice; 3LNO yellowtail; and 3NO witch. Department of Fisheries and Oceans, 18 August 1989.

[4] NAFO's 12 members include Canada, the EC, Bulgaria, Cuba, Denmark in respect of the Faroe Islands and Greenland, the German Democratic Republic, Iceland, Japan, Norway, Poland, Romania and the Soviet Union.

[5] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 15, 5 March 1988, p. 12.

Although the U.N. Convention on the Law of the Sea (UNLOS) refers to the special rights and interests of coastal states in the fisheries resources of their adjacent seas, and specifically calls for regional organizations such as NAFO to take measures to conserve these resources, including straddling stocks,[1] the Convention, which has been described as the "constitution of the oceans," has yet to be ratified by the 60 countries necessary to bring it into force.[2]

At NAFO's annual meeting in September 1989, the EC left unanswered the question of whether its vessels would comply with the quotas set for 1990. In October 1989, the federal government appointed an Ambassador for Marine Conservation. It also proposed an amendment to the *Control Fisheries Protection Act* to give Canada legal authority, in accordance with international law as set out in the UNCLOS (Article 77), to manage and harvest sedentary species such as surf clams on the Continental Shelf beyond the 200-mile limit. The Minister for International Trade also embarked on a public awareness campaign to press the EC to end its overfishing in the region.

For many, the preferred long-term solution is for Canada to extend its fisheries jurisdiction to the edge of the Continental Shelf, pointing out that this country already has jurisdiction over non-renewable seabed resources there, and that in the past has acted to secure national interests in such matters.[3]

Foreign overfishing of stocks straddling the 200-mile limit can no longer be tolerated and requires a much firmer response by the Government of Canada. Although there are few countries in the world which have continental shelves wider than 200 miles and an extension of Canadian fisheries jurisdiction would likely meet objections from certain members of the international community, especially those now benefiting from overfishing,[4] the Committee nevertheless recommends:

(6) That the federal government step up sanctions beyond port closures and the curtailment of preferential access to surplus fish stocks within the 200-mile limit to bring pressure on those countries who overfish the so-called straddling stocks. The Prime Minister, the Secretary of State for External Affairs, and the Minister of Fisheries and Oceans should develop a strategy to establish full functional Canadian fisheries jurisdiction over the whole Continental Shelf.

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[1] United Nations, *The Law of the Sea* (United Nations Convention on the Law of the Sea with Index and Final Act of the Third United Nations Conference on the Law of the Sea), New York, 1983, Article 63, p. 22.

[2] A total of only 35 countries have so far ratified the treaty. See Clyde Sanger, "Law of the Sea: A Canadian Opportunity," *International Perspectives*, January/February 1988.

[3] For example, when Canada declared the Gulf of St. Lawrence and the Bay of Fundy to be within Canadian jurisdiction.

[4] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 15, 5 March 1987, p. 17.

FISHERIES ENFORCEMENT

> The fishery is a valuable resource and the actions taken to protect it should reflect the value. Since we will never catch all offenders, we must provide strong disincentives that send the message out clear and strong.
>
> *Proceedings*, 9 May 1988, p. 70

> There is no shame to getting caught and paying a $400 fine. It is almost a badge of honour. Perhaps I should retract that statement. I am sorry to have to be blunt with you, sir.
>
> *Proceedings*, 1 March 1988, p. 16

Since 1977, DFO has devoted much effort in the area of surveillance and in enforcing Canadian fisheries regulations. Indeed, Canada's claim to 200 miles means little unless those fishing in its waters follow the regulations that have been set. Effective enforcement is an especially important component of fisheries management; without it, the expenditures in all other aspects of management are wasted. As such, enforcement and surveillance is the last area where DFO resources should be reduced.

Amendments to the *Coastal Fisheries Protection Act* were announced in January 1987, providing for sharply increased fines of $150,000 on summary conviction and $750,000 on indictment for unauthorized fishing by foreign vessels inside the 200-mile limit, and $100,000 on summary conviction and $500,000 on indictment for other offences such as unloading illegal catches. Other initiatives taken by the federal government included arming offshore patrol boats for the first time, introducing an observer program on offshore fishing vessels, and increasing air surveillance through private source contracts. Measures to bolster the Department's fisheries enforcement capability have apparently been successful in reducing the number of violations and illegal incursions into Canadian waters.[1]

To ensure compliance with Canadian regulations, 100% observer coverage has been implemented on all foreign vessels and domestic offshore coverage has been enhanced.

Domestically, however, the Committee learned that there are opportunities for collusion between fishermen and processors, whereby catches are not always properly recorded, and in some instances the amount taken (or destroyed on board) or the area of capture may even be misreported. This is all the more serious since important management decisions are based on the information in those reports. It has been noted that estimates using 1982 data put the value of illegal fishing in the region at about $100 million a year in 1985. Generally, there was a consensus on the need for more enforcement or deterrence through increased penalties such as fines, forfeiture of catches, and more fisheries enforcement personnel. One witness who testified put it this way:

> No fisherman really wants to cheat; it is just that the incentives are so great and the chance of getting caught, and the amount of fine which you may have to pay if you do get caught, are not enough to discourage it.[2]

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[1] DFO is also developing an electronic identification system that could be installed on all licensed vessels fishing in Canadian waters.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 28, 1 March 1988, p. 15.

The Committee considers it essential that DFO adopt a more stringent enforcement and surveillance regime to deter fishing violations by Canadian fishermen within Canada's 200-mile zone. Presently, the maximum fine under federal regulations is only $5,000.

The Committee recommends:

(7) **That the Department of Fisheries and Oceans substantially increase penalties for domestic violators of fisheries regulations. The Department should periodically review and increase penalties if need be so that sanctions greatly exceed potential gains from fishing illegally. Fines should be pro-rated according to the severity of the offence. Fishing privileges should be withdrawn to deter repeat offenders;**

(8) **That the Department of Fisheries and Oceans adopt measures, such as selected fish plant audits, which would encourage more accurate reporting of catches. The Department should be provided with the resources necessary to enforce its fisheries regulations;**

(9) **A major peacetime role of the Canadian military should be the surveillance of Canada's coastlines.**

FISHERIES SCIENCE AND CONSULTATION

> To help you to enter this particularly obscure universe, let me guide you for a few minutes, starting our visit with that ingenious creation, the Advisory Committee, which heightens mystification to a new degree.
>
> *Proceedings*, 17 June 1988, p. 9

> The main problem is the lack of cooperation between producers and government officials. Decisions are made without consulting those who are best informed.
>
> *Proceedings*, 16 June 1988, p. 66

Fisheries science is the foundation of all of DFO's management programs aimed ultimately at benefiting the entire industry. It may be fairly stated that fish stock assessment and fisheries management in general is a young and not yet precise science. Although most witnesses who appeared before the Committee were generally satisfied with the Department's overall performance in managing fish stocks, scientific advice has apparently not been received by all segments of the industry with a very high degree of confidence. A great number of fishermen suspected that scientific assessments were being based on poor data (e.g., northern cod) or were sometimes modified because of social, economic or even political considerations. Many unequivocally stated that they would like fisheries scientists and managers to go out in their boats to see "what is really going on." As one spokesman put it, "there's no reality to what they are talking about."[1]

Comments like these are an especially serious concern to the Committee since resistance to scientific assessments and advice can lead to the misreporting of catches

[1] *Ibid.*, Issue No. 41, 26 May 1988, p. 76.

by species, volume and area, the very information upon which scientific assessments are based and fisheries management decisions taken.

In part, misunderstandings between the scientific community and fishermen are problems of communication. Indeed, fisheries science, especially the technical terms used, such as recruitment, the F0.1 concept, year-class, etc., can be confusing to the uninitiated. As the President of the Natural Sciences and Engineering Research Council of Canada noted in 1987:

> . . .It is not easy to translate scientific jargon; neither is it impossible. It is, in fact, essential for the credibility of the scientific advisory process, that the basis for scientific advice is understood, and that the advice itself is understood by the people whose operations and incomes are affected by it. This means an investment in time on both sides.[1]

A major factor contributing to this overall atmosphere of mistrust is the fact that not all fishermen are satisfied with the consultative mechanisms in place and the degree to which they have access to decisionmakers, particularly with respect to licensing policies and the establishment of TACs and their allocation. This is despite the expansion of fisheries consultation since the advent of the 200-mile limit and the acceptance of the Kirby Task Force recommendations on this subject.[2] As one researcher from the Gorsebrook Research Institute for Atlantic Canada Studies remarked:

> On the one hand, policies and regulations appear to the fishermen as directives issued from on high, devoid of input from consultation and discussion. They are told by local DFO employees, most often fisheries officers, what they are going to be required to do and what the consequences will be if regulations are not followed. Needless to say, this process, be it real or imagined, contributes to and accentuates the fishermen's sense of estrangement from DFO and fisheries policy.
>
> On the other hand, from the point of view of the fishermen, many of DFO's imperatives fail to take into account sub-regional and community variations in traditional fishing practices or local socio-economic conditions. Consequently, to the small boat fishermen, many fisheries policies and regulations appear to threaten their way of fishing and insult their understanding of specific fisheries. The content of fisheries policies, as well as the methods of implementation, imply that decisionmakers in DFO regard small boat fishermen as shortsighted. . .[3]

On this subject, the Committee heard evidence to the effect that much can be learned from Scandinavian countries, where fishermen have a greater say in resource management[4] and where everyone "from the person in the small boat to the corporate executive in the office tower has an overall appreciation of what is necessary in terms of sharing and compromise. . ."[5]

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[1] Dr. Art May, Speech before the 1987 FCC Convention, September 1987.

[2] See Task Force on Atlantic Fisheries (1982), p. 343.

[3] Anthony Davis, "Property Rights and Access Management in the Small Boat Fishery: A Case Study from Southwest Nova Scotia," in *Atlantic Fisheries and Coastal Communities: Fisheries Decision-Making Case Studies*, C. Lamson and A.J. Hanson, editors, Dalhousie Ocean Studies Programme, Halifax, 1984, p. 133-134.

[4] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 46, 17 June 1988, p. 23.

[5] *Ibid.*, Issue No. 39, 24 May 1988, p. 92.

With respect to fisheries consultation, it is evident that many groups and individuals have had their fill of advisory committees. The solution to this difficult problem does not appear to be in expanding their numbers, but in promoting closer collaboration, cooperation and trust between fishermen and fisheries managers and scientists. The Committee recommends:

(10) That the Department of Fisheries and Oceans pursue means to improve the frequency and quality of communications between departmental scientists and fishermen and fishermen's organizations. The Department should make available to client groups workshops or seminars on fisheries science and resource management concepts;

(11) That the Department of Fisheries and Oceans take further steps to involve the participation of actual fishermen in the resource assessment, consultative and decision-making process. The Department should take advantage of fishermen's ability to collect data and allow scientists to work on board commercial fishing vessels. Membership on Advisory Committees should be periodically reviewed to ensure the fullest possible involvement of all those concerned.

THE SIZE OF LANDED COD

> I could sit here all morning and tell you, but for you to see it on the wharf would be, you know... It's just unbelievable to see these little fish come in.
>
> *Proceedings*, 9 May 1988, p. 43

> We obviously can't have the chicken and the eggs, if we kill the chicks.
>
> *Proceedings*, 14 June 1988, p. 73

> Anyone acquainted with the delicate nature of cod ova and the conditions under which it comes to life, will also admit that ... very few of the large number of eggs a codfish carries come to life and become fish, and that without proper protection, even the best fishing grounds, by overfishing and destruction of immature fish, in a few years can be exhausted.
>
> *Annual Report of the Newfoundland Fisheries Commission for the Year 1889*, March 1890

Atlantic groundfish stocks have been rebuilt at a fairly impressive rate over the last decade and the so-called "biomass" was reported to be at its highest known level.[1] Statistics, however, don't always tell the whole story.

The Committee learned that a large quantity of small fish are being landed in many areas of the East Coast, and that a growing number of both fishermen and processors have been ignoring the minimum size limit for cod set by DFO. Experienced inshore fishermen claimed that the size of fish, particularly cod, had progressively diminished over past decades concurrently with the decline of some inshore fisheries for this species.

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[1] *Ibid.*, Issue No. 25, 3 February 1988, p. 92, 96.

From a fisheries management perspective, harvesting small fish,[1] the extent of which is not well-documented, is not only a destructive fishing practice with grave implications for the long-term health of stocks, but also an unconscionable waste if the dead fish are dumped overboard. One witness noted that the amount of cod discarded in NAFO area 2J3KL by the Canadian offshore fleet alone in 1986 amounted to almost 16 million fish, or nearly 25% of all cod landed.[2] This would have represented about 2% of stock numbers for four and five year olds, as estimated in 1986, but since the stock was in fact much lower than the assessed level that year, discards would have represented a much larger percentage.

A recent CAFSAC assessment indicated that the biomass (total weight) of northern cod age three years or older increased from a low of about 450,000 tonnes in 1976 to about 1.2 million tonnes in 1984, but had since declined to about 1 million tonnes because of fewer young fish entering the population in 1986 and 1988.

In May 1989, the Harris Panel on Northern Cod stated that, although there may not have been a significant change in population biomass trends for northern cod since 1984, this alone may mask internal changes in the age structure of the population and thus be misleading or not very instructive. A downward trend in the number of fish in the population between 1984 and 1988 would reflect a decline in the number of younger age groups (three to five year olds) entering the population. The Panel called for a rebuilding of the spawning population as the guiding principle in managing the northern cod stock.[3]

This Committee shares the concerns of several witnesses who drew our attention to the fact that unless a greater proportion of fish are allowed to reproduce before they are caught, the industry may soon destroy the resource. The danger is real in all areas of the East Coast, and frightening in its consequences.

The economics of fish size are just as straightforward and far-reaching. The Fisheries Division of the Institute of Fisheries and Marine Technology provided the Committee with the following analysis:

> As codfish double their length, they increase their weight five times. Many south west coast [Newfoundland] codfish are harvested or destroyed at 34 cm long (13.4″ — .4 kg); if such year classes were left in the water two years, they would reach 50 cm (19.6″ — 1 kg). Even allowing for a natural mortality of 18%, the harvest for this year class could increase to 163% two years later (optimum harvest age is 5 years old). Put another way, a tonne of 34 cm fish contains 2,500 fish; a tonne of 50 cm fish 1,000.[4]

The Harris report on northern cod has said as much:

> It would appear to make neither biological nor economic sense to secure one tonne of low value product by killing 1,000 or more juvenile fish when, a short two years

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[1] Minimum fish sizes for cod, haddock and pollock are 41 cm total length (including head and tail) and 31 cm dressed length (head and tail removed); for halibut 81 cm total length or 61 cm dressed length.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 39, 24 May 1988, p. 89. A CAFSAC study for 1986 put the level of discards at 24.4% by number and 10.7% by weight.

[3] L. Harris *et al.*, "Independent Review of the State of Northern Cod," 15 May 1989, p. 20-21, 33, 36.

[4] The Institute of Fisheries and Marine Technology, Brief submitted to the Standing Senate Committee on Fisheries in St. John's (Nfld.), 24 May 1988, p. 4-5.

later, the same tonne of higher value product can be had by taking only 500 older (and heavier) fish. Fishing strategies that would permit most three- and four-year-old cod to escape would, in a very short time, we believe, be seen to pay handsome dividends.[1]

A tonne of small fish may require over twice the handling and gutting effort, so it is often discarded. Small fish also reduce the handling capacity of plants and increase processing costs because the same number of cuts are required in filleting and trimming, regardless of the size of fish. The yields obtained from large fish may exceed 40% of dressed weight, whereas for smaller ones they seldom exceed 25%.[2] Besides producing higher value fillet packs and saltfish products, processors can also cut portions such as nuggets and tails from larger fish, instead of being limited to frozen block production. More by-products like tongues and livers can also be recovered.[3]

So far, experiments have been conducted on the use of square mesh nets and other harvesting technologies which the Committee believes warrant much fuller investigation and wider application. The Institute of Fisheries and Marine Technology suggested that a management approach based on an "economic optimum yield" rather than a "biological optimum" be adopted so that both biological and economical considerations are taken into account to maximize economic benefits.[4]

The problem of dumping fish at sea because of size, and also because catches are sometimes incidental to species sought, may have been partially addressed by increased observer coverage, the introduction of mandatory landing sites, and increased surveillance and penalties. The amount may have also fallen appreciably partly because of the use of larger meshes and of square webbing.[5]

Objections were also voiced during the Committee's hearings against fishing spawning stocks, which was said to have drastically impeded the reproduction of cod.

These matters have both market and serious resource implications. The Committee recommends:

(12) That the Department of Fisheries and Oceans determine the precise economic effects of harvesting and processing small and immature Atlantic cod;

(13) That the Department of Fisheries and Oceans review the effectiveness of regulations pertaining to fishing gear and their effects on the size of Atlantic cod landed and promote fishing methods, such as the use of square mesh gear, that reduce the harvesting of immature fish. Fishing in areas where there are spawning stocks should be severely curtailed.

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(1) Harris (1989), p. 39.
(2) The Institute of Fisheries and Marine Technology, Brief, p. 6.
(3) *Ibid.*
(4) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries,* Issue No. 39, 24 May 1988, p. 116.
(5) Task Group on Newfoundland Inshore Fisheries (1987), p. 43-44.

FISHERIES RESEARCH – The Case of Northern Cod

> The grave fact confronts us, that for years past our shore cod fishery has been steadily declining, and of late, that decline appears to have been accelerated. . . . For such a decline there must be causes. It is our part to search out and remove these causes and use remedial measures.
>
> *Annual Report of the Newfoundland Fisheries Commission for the Year 1889*, March 1890

> There's no solution, no guarantee to an inshore fishery anymore.
>
> *Proceedings*, 26 May 1988, p. 23

The Department operates seven major research institutes on the East Coast: the Arctic Biological Station (Ste-Anne-de-Bellevue), the Gulf Fisheries Centre (Moncton), the Halifax Fisheries Research Laboratory, the Northwest Atlantic Fisheries Centre (St. John's), the Bedford Institute of Oceanography (Dartmouth), the St. Andrews Biological Station, and the Maurice Lamontagne Institute (Ste-Flavie), which opened in December 1986.[1] Besides conducting both short-term and long-term research on fish, invertebrates, marine mammals and plants, and the environment, scientists in these centres, along with those in many smaller laboratories, provide fisheries managers with advice on the biological consequences of various management options (e.g., quotas, seasons, gear sizes, etc.).

As the Committee travelled the East Coast, it sensed the frustration of inshore fishermen with the difficulties of the cod fishery in many regions, but especially along the coasts of Newfoundland and Labrador. With the extension of the 200-mile limit in 1977, a total annual catch of 350,000 to 400,000 tonnes was projected for northern cod, the North Atlantic's largest groundfish stock. Forecasts were based on a management strategy that would allow the stock to grow, and formed the basis of the restructuring of the Canadian offshore sector which followed.[2] Actual catches, however, never lived up to these expectations and the highest TAC never exceeded 266,000 tonnes.

The total catch of northern cod increased slowly after 1978, and between 1982 and 1988 was relatively stable at about 230,000 tonnes (Table 23).[3] Inshore landings rose from 1974 to reach a peak of 113,049 tonnes in 1982, but declined thereafter to about 72,369 tonnes in 1986 and have recently begun to recover.[4] Offshore catches, on the other hand, increased from 90,674 tonnes in 1981 to 179,137 tonnes by 1986.

Given that a large proportion of the fish migrates in the spring to inshore areas and that inshore landings declined with the introduction of EAs in 1982, it came as no

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[1] The Committee visited the last three during its East Coast hearings. There are 12 major scientific centres across Canada. Scientific activities represent about 27% of the Department's total 1988-89 operating expenditures and 36% of total person-years.

[2] The exploitation rate was initially set below F0.1 to provide for a faster recovery of the inshore fishery. Between 1984 and 1988, the fishery was regulated at F0.1, which implied that about 16% of the stock would be harvested annually.

[3] Total landings of 251,506 tonnes in 1986 and 257,578 tonnes in 1988 were due to higher catches by other countries outside the Canadian 200-mile fishery zone. A record total catch of about 800,000 tonnes was taken in 1968.

[4] Inshore landings in 1988 might have been higher if some plants had not been processing capelin roe.

surprise that inshore fishermen blame the Canadian and foreign offshore fleets for excessive discarding at sea and for taking too much fish. As one witness put it: "What the big fellow isn't taking outside, the small fellow will take inside."[1] Prior to the development of the offshore trawler fishery for northern cod, Newfoundland inshore fishermen using traps and other types of fish gear reportedly were "able to harvest as much as 300,000 tonnes of cod in a season."[2] As mentioned earlier, many witnesses also expressed very strong comments on offshore winter fishing on spawning grounds and the increasing population of seals. They were convinced that these were adversely affecting the inshore fishery, and warned that an ecological crisis was in the making.

TABLE 23

CATCHES OF COD (IN 000 TONNES) IN NAFO DIVISIONS 2J3KL, 1974-1988

	Inshore Catch	Offshore Catch	Total Catch	TAC
1974	35,181	337,469	372,650	657,000
1975	41,213	246,295	287,508	554,000
1976	59,939	154,281	214,220	300,000
1977	72,623	100,097	172,720	160,000
1978	81,455	57,104	138,559	135,000
1979	85,822	81,077	166,899	180,000
1980	96,523	79,265	175,788	180,000
1981	80,038	90,674	170,712	200,000
1982	113,049	116,725	229,774	230,000
1983	106,423	125,922	232,345	260,000
1984	97,721	134,750	232,471	266,000
1985	79,883	151,410	231,293	266,000
1986	72,369	179,137	251,506	266,000
1987	78,747	156,263	235,010	256,000
1988	101,925	155,653	257,578	266,000

Source: Canadian Atlantic Fisheries Scientific Advisory Committee, June 1989.

In 1987, CAFSAC put forward three possible explanations for fluctuations in inshore cod landings from one year to the next:

> The abundance of fish inshore depends upon the biomass and age structure of the Division 2J3KL stock at the beginning of the inshore fishery and upon the

[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 39, 24 May 1988, p. 156.

[2] Inshore Fishermen's Improvement Committee, *The Inshore Fishery in Newfoundland and Labrador: An Overview*, St. John's, May 1988.

proportion of the stock which migrates inshore. This proportion may vary annually because of factors such as water temperature conditions and the distribution and abundance of prey species such as capelin and squid.

The catchability of the cod inshore may vary with environmental and biological conditions which affect their behaviour and distribution in relation to the various gear types. Factors such as wind direction and strength may affect the thickness and depth of the zone of suitable temperature for cod and thus affect the success of the inshore fishery. The efficiency of the gears may also be affected by the presence of slub (accumulations of microscopic marine plants) on the netting and by unusual current and wind patterns. In the case of baited hooks, cod filled with capelin or squid are not likely to be taken.

The level of fishing effort will directly affect the inshore cod catch. Fishing effort will vary with environmental conditions such as ice cover, market conditions, prices, full use of limited fishing grounds and gear competition. There may be diversion of effort to fisheries for other species such as capelin, squid and crab. This can occur if catches and prices for another species are more lucrative than for cod.[1]

A Task Group on the Newfoundland Inshore Fisheries (TGNIF), made up of an international team of scientists, later re-examined the CAFSAC assessment and also concluded that the decline in inshore catches in the area was due to a combination of factors: changes in availability and slower growth of the stock; uneven distribution of fishing effort offshore; possible depletion of local stocks by inshore fishermen; redeployment of inshore effort; effects of fishing on recruitment; and slower growth of fish.[2]

The comments made by the Superintendent of Fisheries of Newfoundland a century ago also bear repeating. They show that then, as now, questions remain unanswered about cod, a species of critical importance to the fishing industry. His remarks also summarize surprisingly well some of the opinions expressed on the issue during the Committee's hearings:

The falling off in the fishery along the shore and in the bays of Newfoundland is generally. . .attributed to. . .

1. Fishing gear which kills out all the stock of mother-fish;

2. Fishing gear which destroys the young immature fish in large numbers, and does not give them a chance to grow up and again replenish the waters;

3. Some think that the increasing bank fishery of late years is the cause that the fish do not visit the shores and bays in such abundance as formerly, much fish being caught on the banks, which otherwise would come to the shores of Newfoundland, and that none of the fish left on the banks can at the present

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[1] Department of Fisheries and Oceans, "Advice on the Status and Management of the Cod Stock in NAFO Divisions 2J, 3K and 3L," *Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC): Annual Report*, Vol. 9, Dartmouth, N.S., October 1987, p. 293-294.

[2] Task Group on Newfoundland Inshore Fisheries, *A Study of Trends of Cod Stocks off Newfoundland and Factors Influencing their Abundance and Availability to the Inshore Fishery*, November 1987, p. 68-69.

time come to the shore because too much fish gear is put out everywhere, as to prevent the fish from coming in;

4. Others again hold the opinion that the sea never can be exhausted of fish, no matter how much man may destroy; but that the fish have deserted the bays and the shores of Newfoundland from causes which are inexplicable;

5. While the majority of the people who have been engaged in the Newfoundland shore fishery all their lifetime acknowledge that the fish on the shores and in the bays gradually have been decreasing, still a few are found who hold the opinion that fish at this present time is just as plentiful as it was formerly, but on account of the fishing population having been fast increasing, the catch for each man has not been so great of late years as formerly, when a less number of men were prosecuting the fishery. These people form their opinions from statistics of the fishery.

There are many other causes assigned by . . . people . . .; but the foregoing are the main and most common opinions of [those] acquainted with the fishery.[1]

Most recent scientific findings suggest that the northern cod stock is much smaller or two-thirds the size estimated by CAFSAC in 1987 and TGNIF later that year.[2] This substantiates in large measure what fishermen told this Committee.

Federal scientists suggested that a reduction in the TAC to 125,000 tonnes in 1989 would be necessary to maintain the fishing effort at the F0.1 level. On 8 February 1989, the Minister of Fisheries and Oceans announced a provisional TAC for northern cod of 235,000 tonnes, a level of fishing higher than F0.1 but one which would "minimize job losses and maintain the stock close to its present size." It should be mentioned, however, that any additional foreign overfishing outside the 200-mile limit will have a further diminishing effect on the stock.

It was also decided that the reduction of 31,000 tonnes in the TAC would come from the offshore trawler fleet (greater than 100 ft. LOA), mobile gear users (less than 100 ft. LOA), fixed gear vessels (65 to 100 ft. LOA), the RSPP and so-called Scandinavian longliners (fixed gear vessels greater than 100 ft. LOA), leaving the fixed gear inshore sector exempted with an allowance of 115,000 tonnes. As well, the federal government established still another group, the seven-member Northern Cod Review Panel, to examine the possible factors which affect the stock, the calculations leading to the 1989 CAFSAC advice, and the data and methods used in assessing and forecasting catches since 1977, to ensure that reliable scientific advice will be available to manage the fishery to 1990 and beyond.

An Interim Report by the Panel released in June 1989, which admittedly presents "minimal discussion and few recommendations,"[3] suggested a TAC of about 190,000

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[1] A. Nielsen, Superintendent of Fisheries, Remarks and Suggestions in Regard to the Cod Fishery in Newfoundland, in the *Annual Report of the Newfoundland Fisheries Commission for the Year 1889*, Presented to the Legislature, St. John's, March 1890.

[2] In 1987, CAFSAC estimated total growth to be 15% per year since 1977; TGNIF suggested 13%. The most recent analysis suggests 10%.

[3] Harris (1989), p. 5.

for 1990. It can be pointed out that nearly two and a half years earlier, a study which concerned itself mainly with the accuracy of the assessment of stock size for northern cod found that "it is likely that the maximum value at which the TAC should be set is around 185,000 tonnes." Accordingly, it recommended that the TAC "be *reduced in 1987* and *further reduced in 1988* unless new and unequivocal evidence warrants otherwise."[1]

A major reason for the difference between scientific advice in 1989 and that in previous years is due to additional data and the use of new analytical methods. There are, however, still many uncertainties with respect to the stock. For example, it is not accurately known whether there are sub-groups, whether these are genetically distinct, or whether they migrate from offshore waters to inshore areas in the same proportion.[2] And while superior scientific models are now being employed, the data are to some degree unreliable.[3]

The Harris Panel identified a number of areas where additional research was badly needed to improve the data available to manage the fishery. On 5 July 1989, DFO increased funding for scientific research, from $3.8 million to $6.8 million, in order to undertake activities such as trawl surveys, hydroacoustic surveys, food surveys, and tagging.

The drastic change in the perception of stock size for northern cod, which accounts for half of the Canadian cod catch and a quarter of the total groundfish catch, raises the question about the accuracy of scientific advice for other species and stocks (e.g., crab and groundfish in the Gulf of St. Lawrence), currently exploited or which may be exploited in the future. For example, with respect to herring, inshore catches of juveniles in the Bay of Fundy used for making sardines have been declining over the years and the reason for this is unknown. The Committee was told that a joint Canada-U.S. program had been initiated to solve the mystery, one which scientists have been working on "for some 50 years or more."[4]

A strong and credible research program is essential to DFO's role in protecting and managing the fishery resource. In view of the importance of fisheries science and research as a basis for a stable industry, the Committee recommends:

(14) That the Department of Fisheries and Oceans significantly increase its support of fisheries research to ensure that it has at its disposal a pool of highly qualified scientists. Additional studies are urgently needed not only to increase the Department's knowledge of the dynamics of individual species and stocks in the Atlantic region, but also their interaction and interdependencies in the ecosystem.

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(1) Derek Keats *et al.*, *A Report to the Newfoundland Inshore Fisheries Association on Scientific Problems in the Northern Cod Controversy*, Department of Biology, Memorial University, 11 December 1986, p. 24, 29.

(2) Harris (1989), p. 6-9.

(3) Fishing mortality for northern cod is reportedly anywhere between 0.35 and 0.55.

(4) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 47, 20 June 1988, p. 101.

CHAPTER VI

Capitalizing on the Resource — Issues and Recommendations

> Who does the resource belong to? Does it belong to the fishermen, the producers, the buyers, the consumers. . .?
>
> *Proceedings*, 13 May 1988, p. 93

> . . .You can't catch the same fish twice.
>
> *Proceedings*, 26 May 1988, p. 25

> In a lot of cases, the political decisions outweigh the sensible solutions in the marketing sector.
>
> *Proceedings*, 11 May 1988, p. 38

AN OVERVIEW

The immense potential of the East Coast fishery is a fact; its resources are unequalled in the world in terms of diversity and desirability of species. Processors are also in close proximity to one of the world's biggest if not richest market, the United States. The paradox for many who appeared before the Committee, however, was the industry's inability to capitalize wisely on this proverbial richness — a problem that has been a long-standing source of frustration. Indeed, the dominant and recurring theme in all regions was that of missed opportunities. Perhaps the Kirby Task Force expressed it best:

> If the fishery attracted the first settlers to much of Canada's East Coast, it has come to represent a bittersweet resource base for their descendants, a resource whose always-bright potential seems to remain just that — potential. There have been good years, to be sure, but they have been part of a cyclical boom and bust pattern that has not captured the potential of the resource with any semblance of stability.[1]

[1] Task Force on Atlantic Fisheries (1982), p. 6.

Protecting and managing the limited fishery resource in a way which maximizes benefits is a difficult task since the waters off the East Coast no longer provide the endless bounty described by the early explorers.[1] As mentioned, most commercially important stocks of fish are now considered to be at or near their biological limits with not much more volume growth in sight.[2] Some have dramatically declined. Because of this, mounting pressures between fleet sectors and provinces for larger shares of the resource will likely not abate in the future. In this regard, the Committee learned that a consortium of 12 companies from Quebec and northern New Brunswick had been denied a claim for access to groundfish stocks outside the Gulf of St. Lawrence (e.g., northern cod).

The inshore-offshore split for groundfish, in particular, is the source of seemingly endless controversy. During the Committee's hearings, coastal fishermen argued that the offshore fleet was not only being allocated more than its fair share but that it did not catch all the quota assigned to it. Also discussed were some of the shortcomings of licensing rules, which were believed to be too restrictive and arbitrary. Some charged that the awarding of new licences was based on partisan considerations, citing the recent controversy over offshore lobster licences in southwestern Nova Scotia as an example. The licensing regime may also have had unintended consequences; as a result of classifying fishing boats according to five-foot length intervals, starting at 35 feet, there was a gradual widening and deepening of the vessels, which resulted in their uniquely squat appearance. This may have reduced their safety.[3]

The climate of animosity and suspicion which still characterizes the fishery today is understandable: not only are there too few fish to go around, there are no hard and fast or scientific rules in allocating them among user groups. Rather, a number of factors are taken into account such as closeness to a given resource, the relative dependency of communities on the fishery, and the efficiency and mobility of fleets.[4] Put in another way, the answer to who gets what, when, where, how and why has strong political overtones. Such decisions have immediate and dramatic impacts on the lives and incomes of various individuals and groups in the industry.

The coastal fishery is usually portrayed negatively as the "social fishery" — too bound to tradition, overcapitalized and labour-intensive to operate profitably — while the offshore is seen as being more economically efficient and easier to manage. It is widely believed that the pursuit of purely economic objectives leads to social costs and political liability, and thus is an option seldom openly contemplated by decisionmakers. Ironically, history has proven inshore fishermen and small- and medium-sized fish plant operators able to adjust and remain competitive in the face of changing circumstances; they form a sector of the industry which ensures that much of the economic rent remains in rural areas[5] (Table 24). In many coastal regions, there is no alternative to

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[1] For example, when John Cabot sailed the waters off Newfoundland in 1497, cod were reportedly so plentiful that the fish could be hauled in with baskets.

[2] Of some 44 stocks covered in the 1989 Groundfish Management Plan, for example, the TACs of only two stocks were allowed to increase over those set in 1988; nine were reduced.

[3] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 42, 28 May 1988, p. 77. Vessel replacement rules that came in effect on 1 April 1989 are now based on an overall measure of vessel capacity, including length, width and depth.

[4] The allocation of stocks among fleet sectors generally reflects the historic distribution of catches.

[5] *Ibid.*, Issue No. 33, 9 May 1988, p. 119.

TABLE 24

FISHING DEPENDENCE BY ATLANTIC REGION

	Total Fishing Labour Force as % of Total Labour Force	Groundfish Production Value as % of Total Production Value	Groundfish Employment (Person-Years)		
			Inshore	Offshore	Total
Labrador-Northeastern Newfoundland	22	77	1,890	5	1,895
Southeast Newfoundland	7	76	2,164	1,714	3,878
South Coast Newfoundland	24	94	955	2,625	3,580
West Coast Newfoundland	14	72	1,699	0	1,699
North Shore Quebec	6	25	452	0	452
Gaspé Quebec	7	34	1,037	165	1,202
Gulf New Brunswick	8	13	276	141	417
Prince Edward Island	12	19	351	68	419
Gulf Nova Scotia	5	38	251	0	251
Eastern Shore Nova Scotia	2	79	1,066	2,252	3,318
Southwest Nova Scotia	12	48	3,662	1,706	5,368
Fundy New Brunswick	3	5	90	0	90

Source: Department of Fisheries and Oceans, 21 April 1989.

fishing. The evidence before this Committee suggests that the inshore fishery may even be more economical than the offshore because it does not need as much fish to be profitable.

Over the period 1982-1988, inshore-offshore groundfish splits have remained relatively stable — a 50/50 split in quotas and an average of 56/44 in landings. Groundfish provides about 22,500 person-years of employment (7,600 in harvesting and 14,900 in processing). Of this total, the inshore generates some 13,900 person-years (7,800 in processing and 6,100 in harvesting) and the offshore 8,700 (7,100 in

processing and 1,600 in harvesting). There are also significant regional variations. In Newfoundland, for example, 1,000 tonnes of groundfish generates 41 person-years of total employment inshore and 23 person-years of employment offshore. In the Scotia-Fundy Region, 1,000 tonnes generates 31 person-years of employment in both the inshore and offshore.[1]

Fish allocation and licensing policy do not fall within this Committee's mandate, as these are part of an elaborate decisionmaking and consultative process. It however recognizes the need for flexibility, such as extending the enterprise allocation system to smaller vessels, or even communities. This could lengthen fishing seasons, reduce gluts and provide a more even flow of raw material to processing plants.[2] It also supports the notion that communities adjacent to the resource have first rights to it. It follows that any future measures to reduce fishing in order to conserve stocks should be borne "equitably" by both the inshore and offshore sectors. In other words, inshore/offshore splits should be reassessed. New approaches must be sought which will return the benefits derived from the resource to those who obtain their livelihood from it.

As well, it is essential for government to provide services, expertise (e.g., market intelligence) and infrastructure (e.g., transportation and distribution systems, chilling and freezing capacity, salting facilities, fish unloading equipment, etc.) under Economic and Regional Development Agreements (ERDAs), the Atlantic Fisheries Development Program, the Atlantic Canada Opportunities Agency (ACOA) and various other types of assistance programs. In some areas of the region, such as in Labrador and the Great Northern Peninsula of Newfoundland, a more focused and coordinated approach to fisheries development is required. Balanced and pragmatic approaches are needed if the fishery is to realize its full potential.

THE ROLE OF GOVERNMENT IN MARKETING

> The demands of the consumer must continue to dictate the form in which fish are marketed. Consumption always regulates sales, and sales regulate not only production but the particular form of the product.
>
> *Report of the Royal Commission Investigating the Fisheries of the Maritime Provinces and the Magdalen Islands*, May 1928

> We do not have the tools. We are small businesses. . . and we cannot afford the infrastructures which would be necessary to have a real knowledge of the market.
>
> *Proceedings*, 2 February 1988, p. 12

> Everybody is out trying to get their share of the fish, and catch them. And what they are going to do with them after they have caught them, sometimes is a mystery.
>
> *Proceedings*, 28 May 1988, p. 15

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[1] Inshore groundfish landings ranged from a high of 59.5% in 1983 to a low of 53.4% in 1986. Department of Fisheries and Oceans, 21 April 1989.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 36, 13 May 1988, p. 87-88. On 10 April 1989, the Minister of Fisheries and Oceans announced the introduction of a trial program of enterprise allocations for mobile groundfish vessels (less than 65 ft. LOA) in the Gulf of St. Lawrence for 1989.

Many of the Kirby Task Force's recommendations on marketing appear to have been overshadowed by the immediate problem of how to restructure the industry. The relevance of the Task Force, however, certainly has not faded with time or changing circumstances.

The industry continues to face unstable export markets and protectionism, fluctuations in exchange rates, growing competition from new species of fish which are increasingly being substituted for cod, and other protein foods. The Canadian industry has been slow in changing from a traditional volume orientation — fishing whatever can be caught and then trying to sell that product — toward a market-driven approach.

Marketing, as opposed to selling, requires long-term planning and takes into account the needs of specific market segments as well as availability of resource. The evidence suggests that the larger companies have certainly demonstrated a commitment to marketing, have taken great strides in developing a broad range of products for retail and food service markets, and seem to be capable of functioning without much government assistance. Some in fact have recently undertaken acquisitions to access new supplies in Alaska and South America to ensure competitiveness on a global basis.

In its report on the West Coast fisheries and in response to the anxieties of witnesses about marketing boards and other potential forms of direct involvement, the Committee specifically recommended that government not be directly involved in marketing the fishery products in the region.[1] These concerns were reiterated on the East Coast by those who believed that government activities, other than that of protecting the resource, discourage private sector investment and dissipate economic returns to the industry.

The Committee, however, could not ignore the views of individuals and groups who criticized the reduction in the range of marketing services provided by DFO to the private sector and who cited specific cases in which some form of increased government assistance and action would be warranted. Given that many of the smaller concerns on the East Coast do not have the in-house specialists or the financial resources needed to undertake sophisticated marketing programs, it must be recognized that government has a constructive role to play by cost-sharing selected market studies, providing continuing marketing intelligence and advice, linking foreign buyers with domestic producers,[2] inspecting fish products to ensure they conform to quality standards, and promoting awareness, knowledge and consumption of Canadian seafood. Moreover, if the full benefits of the Canada-U.S. Free Trade Agreement are to be achieved, more emphasis will have to be placed on marketing. The Agreement presents opportunities but, like many things, these have to be developed.

In view of the apparent disparity in marketing capability between large and small companies on the East Coast, the Committee recommends:

(15) That federal and provincial government departments and agencies expand the range of marketing services to fishing companies needing professional assistance.

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[1] Standing Senate Committee on Fisheries, *The Marketing of Fish in Canada: Interim Report II*, December 1987, p. 67.

[2] Including East Bloc countries and those receiving development assistance through the Canadian International Development Agency (CIDA).

THE UTILIZATION OF HARVESTED FISH

> It is a sin to see such a rich resource being wasted. It is at our doorstep, and we are not making an intelligent use of it.
>
> *Proceedings*, 13 May 1988, p. 86

> The Atlantic fishery has always profited from the presence of abundant marine resources along these shores. This bounty enabled us to develop on the basis of quantity. Unfortunately, or perhaps fortunately, this development strategy is running up against constraints of supply.
>
> *Proceedings*, 23 June 1988, p. 15

> Perhaps when Hibernia is finally developed, we could look at a scenario of dumping two-thirds of the oil produced . . . back into the ocean. That is exactly what we do in the fishery.
>
> *Proceedings*, 24 May 1988, p. 11

Future economic gains in the fishery will come about largely by creating greater value from a limited volume of fish.[1] Statements made to the Committee by many fishermen indicated that large but unknown quantities of potentially valuable fish were being caught and routinely dumped at sea because they were either too small or incidental to the species sought. For many years in Newfoundland, especially during the capelin fishery, some cod trap fishermen have had to discard their catches because fish plants were too busy processing capelin. In this regard, pens which hold the fish alive until plants can process them might prove to be a simple and effective solution.[2]

Once the fish are landed, tremendous waste also results from current processing practices. The flesh component of groundfish such as cod is about 60% of dressed weight, but only about half of this amount is utilized. In other words, over two-thirds of potentially valuable protein is thrown away.

Some companies are now beginning to show an interest in fish waste management, such as using flesh recovered from the tails, heads and skeletal frames of fish, materials proven to be suitable as minced product or usable for further processing. Additional marketable by-products that would otherwise be discarded include roes, milt, livers, cheeks, tongues and natural flavourants. Fish skins made into specialty leathers ("sea hides") have shown remarkable market potential, as has the production of fish oils as dietary supplements or for medicinal purposes. In Cape Breton, members of the Committee were shown samples of dried swim bladders from cod that an entrepreneur intended to produce in response to a specific consumer demand. Some witnesses suggested that the degree of material recovery can be increased with the use of systems that monitor production runs and by improving the quality of raw materials entering the production process.

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 34, 11 May 1988, p. 13.

[2] Pens were used by 16 fishermen of the Petty Harbour Fisheries Co-op (Nfld.) during the 1989 trap season. Department of Fisheries and Oceans, "Live Cod Holding Project: Summary Report", 17 August 1989.

In recent years, there has been a dramatic growth in markets for herring roe and a corresponding decline for whole or filleted herring. Once the roe is extracted, the remaining carcass, which constitutes 93% to 95% of the fish by weight, is discarded. The total amount is conservatively estimated at over 50,000 tonnes annually. Because of the environmental hazards of disposal, municipalities in some areas have banned land burial, and there is already a growing concern about dumping at sea. A similar situation exists in the roe fishery for capelin where only about a third of the fish harvested is actually used in production.

One possible solution to this perennial problem is the production of fish silage, a liquid protein made by adding acid to ground-up fish or fish offal. This could be used as fish meal to supply the burgeoning aquaculture sector on the East Coast, especially in the Bay of Fundy area where there are a growing number of fish farms.

The fishery is an industry which can ill afford the luxury of wasting the benefits of its natural endowment. The Committee deplores current wasteful harvesting and processing practices and recommends:

(16) That the Department of Fisheries and Oceans determine the extent of dumping fish and fish waste at sea. Jointly with commercial fishermen, the Department should continue to develop and promote measures to reduce the incidental catch of non-target fish stocks. Every effort should be made to determine possible uses for by-catches;

(17) That federal and provincial government departments and agencies increase the level of financial assistance through regional development programs to companies wishing to develop from fish waste marketable products such as animal feeds, fertilizers and food. Capital investment aimed at obtaining higher yields from harvested fish should be supported. Governments should devise policies which encourage the processing of all usable parts of harvested fish.

UNDERUTILIZED SPECIES AND STOCKS

> . . .Our fishing industry has, in large measure, fully identified and exploited the most evident, the most proximate, the most readily processed and the most cost-effective resource bases.
>
> *Proceedings*, 12 May 1988, p. 39

Although strong market demand for seafood and shortages of supply have meant that hitherto underutilized fishery resources are now beginning to be harvested and processed, literally thousands of tonnes of the region's inventory go unharvested each year. A number of briefs submitted to the Committee emphasized the need to develop these, not only to diversify the fishery and lessen the cyclical boom and bust nature of the industry, but also as a means of providing fishermen and processors with supplemental income opportunities.

The constraints on the utilization of certain species and stocks include: environmental factors (e.g., ice, remoteness of fishing grounds and low catch rates),

TABLE 25

MAJOR UNDERUTILIZED SPECIES AND CONSTRAINTS TO THEIR USE[1]

	Environmental	Technological	Marketing
Groundfish			
Argentine	—	*	*
Skate	*	—	*
Arctic Cod	*	—	*
Redfish	*	*	*
Turbot	*	*	*
White Hake	—	—	*
Red Hake	—	—	*
Witch Flounder	*	—	—
American Plaice	*	—	—
Silver Hake	—	*	*
Grenadier	*	*	*
Cod (2GH)	*	—	—
Pelagics			
Dogfish	—	—	*
Sand Lance	—	*	*
Mackerel	*	*	*
Capelin	—	—	*
Shellfish			
Iceland Scallops	—	*	*
Shrimp	*	—	*
Jonah Crab	—	*	—
Rock Crab	—	*	*
Clams	—	—	*
Squid (offshore)	*	*	—

[1] Other species include seals, cusk, wolfish, monkfish, billfish, porbeagle, sharks, butterfish, tunas, eel, sea urchin, red crab, mussels and whelks.

Source: Department of Fisheries and Oceans, *Underutilized Fishery Resources in Atlantic Canada: A Discussion Paper*, June 1986, p. 2.

inadequate or inappropriate harvesting and processing technology (e.g., lack of on-board processing/freezing capacity required for highly perishable species), and in some cases, marketing constraints (e.g., species for which there are no markets or where markets do not provide suitable economic returns for Canadian producers) (Table 25). The term "underutilized" is generally used to cover three main categories of species or stocks: "unutilized", those that are not fished to any extent by either foreign or Canadian fleets; "underutilized", those of which less than 50% are fished; and "foreign utilized", those that are fished mainly (though not necessarily exclusively) by foreign countries.[1]

Canada extended its jurisdiction to 200 miles in the context of the LOS. Once Canada establishes its harvesting capabilities and determines the quota it needs, in

[1] Department of Fisheries and Oceans, *Underutilized Fishery Resources in Atlantic Canada: A Discussion Paper*, June 1986, p. 2.

most cases, the surplus is made available to other countries. There are two types of foreign allocations, those made by NAFO and those made by Canada. NAFO allocations can be fished either outside the Canadian zone under NAFO regulations or inside the zone under Canadian regulations by bilateral partners with a satisfactory fisheries relationship with Canada. Foreign allocations made by Canada are fished inside the zone under Canadian regulations. The following elements are taken into consideration in making foreign allocations:

> Cooperation and support of Canadian conservation and management initiatives in the Northwest Atlantic Fisheries Organization (NAFO).
>
> Support for Canadian initiatives to reduce foreign overfishing of transboundary stocks.
>
> Consistent compliance with regulatory requirements for the management of fish stocks within the 200-mile zone.
>
> In the case of centrally planned economies, maintenance of a satisfactory commercial relationship is a secondary criteria for the determination of allocations.[1]

Following the declaration of a 200-mile limit, Canada allocated surplus resources in return for cooperation on conservation and for explicit commitments to facilitate the development of markets for Canadian fish products. It allowed allocations of small amounts of non-surplus fish (i.e., stocks which Canadian fishermen have demonstrated an ability to harvest) to foreign countries in return for specific commitments to improve market access. Since June 1986, the stated objective has been to place greater emphasis on securing cooperation on conservation, and on ensuring that there are no links between allocations and trade with free market countries.[2] Elimination of non-surplus allocations, except under existing treaty commitments, is another objective. Foreign allocation of Canadian managed stocks amounted to about 212,000 tonnes in 1988, and consisted mainly of silver hake, redfish, Greenland halibut, capelin, squid and some cod.

Canada has a number of annually renewable agreements with East Bloc countries with centrally planned economies which link access to Canadian fishing grounds for such species as silver hake, squid, roundnose grenadier, turbot, redfish and flounder in Atlantic waters, and Pacific hake off the coast of British Columbia, to sales of processed products. These purchase commitments, which in 1988 totalled $17.9 million, are used as a bridging mechanism to allow Canadian fish producers access to markets which they might not otherwise have.[3] In some cases, direct sales (over-the-wharf and over-the-side) represent the only market for Canadian fish or fill a role as an alternative market. Over-the-side arrangements have been contentious over the years because they create no shore-based processing jobs.[4]

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[1] Department of Fisheries and Oceans, *1987 Atlantic Foreign Allocation Plan*, p. 5.

[2] Under a scheme of allocations for market access, prospective buyers of Canadian fishery products would be catching their own fish in Canadian waters. The Task Force on Atlantic Fisheries recommended that Canada develop its markets by conventional means. Task Force on Atlantic Fisheries (1982), p. 201.

[3] Purchase commitments by country in 1988 included the Soviet Union ($12.0 million), German Democratic Republic ($2.4 million), Cuba ($2.3 million) and Poland ($1.2 million). Allocations to these countries totalled about 164,000 tonnes.

[4] Atlantic over-the-side sales in 1987 comprised mainly mackerel and herring, and also some capelin and gaspereau.

Although it is possible that, in exceptional cases, foreign allocations provide the greatest net benefit in economic and conservation terms, the limited growth of the resource expected in Canadian waters points to the need for a further displacement of the foreign fishing effort (i.e., a planned reduction in fish resources allocated to foreign nations).

The Committee was made aware during its hearings that foreign nationals may in the future lay claim to some underharvested fishery resources (e.g., mackerel).[1] It is noteworthy that, until recently, the huge groundfish resource in the North Pacific Ocean inside the American 200-mile limit, which was once largely harvested by Japanese, Soviet and Korean factory ships, has expanded the industry in the United States. Domestic harvesting capacity has rapidly grown by way of joint ventures with foreign processing vessels, at-sea processing by American factory freezer vessels, and foreign investment. There were no foreign catches in the U.S. EEZ off Alaska in 1988.[2]

The trend in the United States has been toward the so-called "Americanization" of fisheries, a policy aimed at encouraging greater exploitation of fishery resources within their 200-mile limit by Americans themselves. A fundamental principle of the *Magnusen Fishery Conservation and Management Act* is the "full utilization" principle. Under a three-tiered allocation system, access to the resource is granted in the following order of priority: American fishermen and processors, American fishermen in joint ventures with foreign processors, and lastly, foreign fishermen and processors.[3] Accordingly, the proportion of the TAC for domestic use has increased, from 0.4 million tonnes in 1977 to 2.8 million tonnes in 1988.

Some non-traditional species of fish on the East Coast have to be frozen at sea because their fragile quality causes them to deteriorate rapidly. Factory freezer trawlers (FFTs) would, therefore, appear essential in their exploitation. On the other hand, to protect onshore plant employment, Canadian fisheries policy restricts the use of this technology, which is routinely employed by the fishing fleets of other countries.[4]

After a lengthy review and despite strong opposition, the federal government decided in 1985 to grant three FFT licences for a five-year introductory period (1986-1990), provided that companies adhered to specific conditions, such as the species harvested (e.g., no more than 6,000 tonnes of a company's northern cod allocation can be harvested in any one year) and the place where it is harvested (e.g., FFTs will not be permitted to operate in the Gulf of St. Lawrence or the Bay of Fundy). One licence each has been reserved for National Sea Products and Fishery Products International, while a third was reserved for a company or consortium to be chosen from the

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 48, 23 June 1988, p. 19; Issue No. 33, 9 May 1988, p. 121.

[2] United States Department of Commerce, *Fisheries of the United States 1988*, Current Fishery Statistics, No. 8800, May 1989, p. iv.

[3] Legislation was passed in 1988 to require that U.S.-flagged fish processing vessels be constructed or reconstructed in the United States, be owned by American corporations with majority control by U.S. citizens, and be manned with at least 75% American citizens or resident aliens.

[4] The difference between a factory freezer trawler and a freezer trawler is that all processing of the FFT catch is done on board the ship.

remaining offshore groundfish companies. So far, National Sea Products is the only company whose licence (the *Cape North* based in Lunenburg, N.S.) is operational.

A number of briefs before the Committee suggested that bringing other FFTs on-line would increase the fishing capacity of the offshore, reduce onshore employment and destroy the traditional life of fishing communities. It was argued that quality demands of the marketplace can be met with existing technology. The controversy over FFTs was also cited in the debate over whether northern cod should be fished by operators from provinces other than Newfoundland.

A socio-economic impact study on the Cape North conducted in 1986-1987 by a government/industry group concluded that the new technology uses "both capital and labour more efficiently than the conventional wetfish trawler onshore processing combination," and that there appears to have been no major problems connected with the operation.[1] The study, however, showed a theoretical decline in employment of 133 person-years and an associated drop in income of $2 million.[2] As well, the *Cape North* caught mostly northern cod (58.4%) and pollock (24.1%) during the first year of operation.

Related to the discussion of underharvested fish was the potential for expanding the fishery in the northern areas of the East Coast, a new frontier for the industry but one which has been slower to develop than other northern countries. Although fishing has been a traditional activity in these regions for generations, especially in nearshore areas (e.g., Arctic char, salmon and seals), the harvesting of cold water shrimp off Newfoundland and Labrador, northern Quebec and the Northwest Territories has increased.[3] There are several proposals to benefit local native organizations and northern communities by further developing offshore fisheries.

There are many reasons why some fishery resources are underharvested, and this is not expected to change greatly in the immediate future.[4] The Committee was told on several occasions that companies do not make the effort needed to develop new fisheries because of the lower profit margins of the fish involved. Some witnesses believed that government assistance would be required in initiating the setting up of an agency or consortium of small- and medium-sized plant operators and fishermen, and in making expertise available on an ongoing basis.

With respect to Enterprise Allocations, which are largely made on the basis of total available resource rather than on its proposed use, the Committee learned that some quotas remain allocated to companies which cannot or will not utilize them fully.

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(1) Department of Fisheries and Oceans, *A Socio-Economic Impact Study of the Factory Freezer Trawler the Cape North*, prepared by Gardner Pinhold Consulting Economists Limited, Griffiths Muecke Associates Limited, July 1987, p. 60.

(2) First year results from 22 February 1986 to 21 February 1987.

(3) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 10. These include two species: pink shrimp and pink striped shrimp, of which the former is by far the most predominant. In 1987, there were 16 licences for this fishery, seven of which were held by native or northern groups. That year, the fishery was managed on the basis of an experimental EA program.

(4) Department of Fisheries and Oceans, *Underutilized Fishery Resources in Atlantic Canada: A Discussion Paper*, June 1986, p. 8.

It may be said that there is practically nothing in the sea that cannot be sold if marketed the right way; it must, however, be cautioned that precise scientific assessments to determine harvestable levels for many underutilized species and stocks must be made before embarking on large development proposals. Much more must be known about the interactions between new fisheries and traditional ones[1] (e.g., a significant fishing effort on capelin may affect predator species such as cod). In northern areas, sustainable fishing levels for shrimp, scallops and turbot have not yet been accurately determined because of limited commercial fishing.[2] Catches have so far been highly variable and unpredictable. As well, productivity levels in northern ecosystems may be much lower than those in warmer regions.

The Committee recommends:

(18) That the federal government conduct a comprehensive review of Canada's foreign allocations policy, including its policy on over-the-side sales, so as to document its net benefits, to the Canadian fishing industry and economy. The review should include the costs and benefits, in terms of current and potential markets, of further displacing the foreign fishing fleet from the Canadian zone. The results of this review should be made available to the fishing industry;

(19) That the Department of Fisheries and Oceans formulate a national strategy to develop underutilized species and stocks. The Department should establish a product and market development unit in support of the fishing industry, to: (a) identify and provide detailed information on species and stocks which show the greatest potential for development; (b) examine and coordinate research and technological development initiatives; and (c) coordinate the activities of its various branches with those of the Department of External Affairs in identifying market opportunities as they arise;

(20) That the Department of Fisheries and Oceans commission an independent and thorough evaluation of its national policy on factory freezer trawlers to determine if this technology has a useful place in the industry. The Department should enunciate more clearly its policy on the use of factory freezer trawlers for underutilized species and stocks;

(21) That the federal government increase technological and financial assistance for the development of underutilized fishery resources through its regional development programs. Canadian operators already actively involved in the fishing industry, either in harvesting or processing, and those adjacent to the resource should be given priority in the development of new fisheries. Offshore companies having Enterprise Allocations with a low record of utilization over a period of time should be required to release their unused quota to other applicants wanting to utilize the resource.

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[1] *Ibid.*, p. 9-10.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 25, 4 February 1988, p. 116.

DIVERSIFYING MARKETS

> I commend you on your work . . . because marketing, in my view, is the key to the future of the fishing industry. . . Over the past few years, we have had a situation where we have been producing fish and trying to find markets afterward.
>
> *Proceedings*, 24 May 1988, p. 49

> . . . The primary problem we're experiencing in this industry: a lack of information.
>
> *Proceedings*, 2 February 1988, p. 20

> For a seafood-producing country like Canada, it is rather strange to have to bring in products from other countries. . .
>
> *Proceedings*, 5 February 1988, p. 33

The fishing industry's greatest challenge is in expanding its market frontiers. Although the number of export markets served by Canadian seafood producers has grown over the years, Canada's largest customer continues to be the United States, where about 60% of the value of all Canadian fish exports is destined. This heavy reliance on a single market heightens the vulnerability of Canadian seafood shipments to changes in the price of competing products and substitutes, income levels and tastes.

The Atlantic groundfish sector, in particular, is so dependent on the United States that any slight movement in demand sends shockwaves throughout the system. A general lack of a cohesive marketing information system and the fact that Canadian exporters not only compete against Alaska pollock and other relatively newer species, but also against each other, make an undesirable situation worse.

Canada's reliance on the United States also renders it sensitive to fluctuations in the exchange rates. The recent strengthening of the Canadian dollar in relation to the U.S. dollar, for example, resulted in reduced net earnings on fish exports to that market. The currencies of Canada's major competitors are also important. An interesting example is Iceland, which devalued its currency on two occasions in 1988 to shore up its exports, 75% of which were sea products.[1] It would be naive to suggest that exports to the United States should be curtailed, but, clearly, a more creative marketing approach should be developed.

The strength of aggressive and professionally planned and executed programs by competitors who are concentrating on the American seafood market also means that effort must be expended to diversify markets. While the industry recognizes the potential of non-traditional markets, specialized segments or niches, much needs to be done to promote a strategy which might be said to be based on the proverb "don't put all your eggs in one basket."

Witnesses before the Committee stressed the importance of Europe, Japan and countries in Southeast Asia that have long histories of fish consumption. With their large populations and improvements in air transportation, freezing and packaging

[1] Department of Fisheries and Oceans, *Entrefilets*, Vol. 10, No. 3, March 1989, p. 10.

techniques, they become logical destinations for Canadian fishery products. Hong Kong, with an annual per capita fish consumption of over 45.0 kilograms (liveweight),[1] for example, ranks as the world's ninth largest importer of seafood. So far, Canada has not been a significant fish supplier to that country, but when squid was abundant in 1979-1981, Hong Kong was the largest buyer of Canadian dried squid.

Possibilities also exist for the sale of cured fish to centrally planned economies. The Committee learned from one witness that European demand for eel is "overwhelming."[2] While fishermen grumble about sea cucumbers and sea urchins fouling their nets, in some parts of the world these "pests" are delicacies. Hake, another underutilized species, is by far the most important type of groundfish consumed in Spain. Demand for monkfish tails, an item of haute cuisine in some European countries, is believed to be virtually "limitless."

Other markets include Third World countries where fish is generally regarded as a desirable source of animal protein and where there are very few taboos on its consumption. Overall, about 60% of the developing world's people reportedly derive 40% or more of their annual protein from fish.

Fish has been a component of Canadian food aid programs since the mid-1960s. Although most prominent in Canada's bilateral food aid program throughout the 1970s, since 1980 the proportion of fish in Canada's external aid increased because of its inclusion in multilateral food aid.[3] Multilateral aid has consisted of canned mackerel and herring while bilateral food aid has included saltfish (cod, pollock) and canned mackerel, herring and sardines.[4] The Fisheries Prices Support Board acts as the procurement agent for fishery products for aid and development programs administered by the Canadian International Development Agency (CIDA) and the World Food Program.[5] In Newfoundland, the Committee learned that a Fish Aid Development Agency (FADA) had also been trying to find a means of drying capelin for shipment to developing countries. Some witnesses suggested that the fish in Canadian food aid, especially in the use of underharvested species, be expanded,[6] not only as a humanitarian gesture, but as a means of developing new fisheries and providing income for both inshore fishermen and those who work in fish processing.[7]

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(1) Based on 1982-84 average.

(2) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 34, 11 May 1988, p. 121.

(3) Department of Fisheries and Oceans, Brief submitted to the Chairman of the Standing Senate Committee on Fisheries, 9 December 1987.

(4) *Ibid.*

(5) The *Fisheries Prices Support Act*, which came into force in 1947, gave the Board the statutory powers of a government corporation. The Board is responsible for investigating and, when appropriate, recommending the support of the prices of fishery products where declines have been experienced. The basic principle of the Act is to protect fishermen against sharp losses of income due to causes beyond the control of the fishermen or the industry. The Board, subject to approval of Cabinet, is empowered to purchase fishery products at prescribed prices, to sell or otherwise dispose of such products, or to make deficiency payments to producers of fishery products.

(6) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 47, 20 June 1988, p. 13; Issue No. 42, 28 May 1988, p. 99.

(7) The federal government decided during fiscal 1981-82 that grains would represent 75% of Canadian food aid, but since this policy expired in March 1987, the ratio of grains to non-grains may vary in the future. Department of Fisheries and Oceans, Brief submitted to the Chairman of the Standing Senate Committee on Fisheries, 9 December 1987.

Many witnesses also drew the Committee's attention to the importance of the Department of External Affairs in assisting export sales via buyer and seller trade missions, international fairs and exhibitions and foreign market intelligence.[1] It is noteworthy that the International Trade Development Branch of DEA was restructured in September 1988: a Fisheries Division now provides seafood exporters with a first point of contact for access to the Department's services and focuses on making the fishing industry more aware of the activities of its posts abroad. To that end, the Division recently compiled a guide to market opportunities, including data by species, country and market, as identified by the Department's overseas posts and missions.[2]

Under its Program for Export Market Development (PEMD), DEA also provides financial assistance to companies to sustain export market development (e.g., for specific project bidding, participation at trade fairs, establishing export consortia). This is done on a shared-cost basis, with funds generally repayable from resulting sales.

Finally, the potential for developing the domestic market should not be overlooked. Despite opportunities made possible with improvements in air transportation, freezing and packaging techniques, it would appear that, because of its marketing patterns, the industry has been undersupplying markets in this country. There may be certain promising domestic market segments not being pursued by small producers because of the high costs of market research and development.

Indeed, an obvious difficulty in maintaining current markets and developing new ones is knowing what consumers want in terms of products (e.g., species, spicing and preparation), quality and pricing. Market profiles change in practically all countries. Many witnesses underlined the need for more accurate, up-to-date and coordinated information on prevailing conditions (e.g., trends, competition, pricing influences), including predictive and forecasting capability. Obviously, this requires resources and special skills. Most hoped for more government assistance in defining the sales potential of new markets and more help in their penetration.

A major recommendation of the Task Force on Atlantic Fisheries was the creation of both an Atlantic Fisheries Marketing Commission (to be composed of members of provincial governments, fishermen's and processors' organizations and the federal government) and three Product Marketing Councils (for fresh and frozen groundfish, salted and dried groundfish, and herring). These bodies would identify opportunities and establish marketing strategies for their products, and plan and undertake generic promotion with government support.[3] The Task Force noted:

> The proposed marketing organization should also help to reduce the degree of mistrust among fishermen, govern ments and processors with respect to marketing. With common information about the market widely available, much of the misinformation and mistrust associated with marketing activities should be eliminated. People will, we hope, be more realistic in their comments on the marketing problem if they have adequate information about it.[4]

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[1] Many provincial governments also provide marketing services to the fishing industry.

[2] Department of External Affairs, *Fisheries Trade Reports: Fish Product Export Market Opportunities Guide*, November 1988.

[3] Task Force on Atlantic Fisheries (1982), p. 303-304.

[4] *Ibid.*, p. 357.

The review and consultation process which followed the Report, however, concluded that no government intervention by way of a Marketing Commission and Marketing Councils was warranted for the following reasons: economic development would be achieved through private initiative, deregulation and private investment;[1] the restructuring of the Atlantic fishing industry would improve its ability to respond to market requirements and develop export markets; and the buoyancy of seafood markets had made fish processors financially more independent.

To improve and increase the flow of marketing information to Canadian seafood producers on the East Coast, the Committee recommends:

(22) That federal and provincial governments increase the assistance provided to smaller companies wishing to diversify and reduce their dependency on single markets. The Department of External Affairs, in coordination with the Department of Fisheries and Oceans, should provide an ongoing and quarterly assessment of seafood export markets to assist the industry in formulating country-specific marketing strategies. An analysis of how the Canadian industry compares with its major competitors should be incorporated;

(23) That the government and industry seriously reconsider establishing the Marketing Commission and Product Marketing Councils outlined in the Report of the Task Force on Atlantic Fisheries;

(24) That the Department of External Affairs, in cooperation with other federal and provincial government departments, increase its contacts with fish processors on the East Coast. The Department should enlarge the fish component of its Program for Export Market Development;

(25) That the federal government commission a comprehensive study of the size, nature and potential of the Canadian fish and seafood market. The study should include an analysis of per capita seafood consumption in terms of edible and roundweight equivalents by species, product form and country of origin. This study should be periodically updated and made available to the Canadian fishing industry;

(26) That government encourage East Coast seafood producers to work cooperatively toward creating a more effective distribution system for the Canadian domestic market;

(27) That the federal government consider increasing the fish component of Canada's food aid programs.

DEVELOPING NEW PRODUCTS

> In terms of any single significant thing that is happening in the marketplace, it is the change in the white fish story toward pollock and whiting at the lower end [of the market] and the necessity for us to do something different with king cod. . .

[1] As outlined in the paper of the Minister of Finance, "A New Direction for Canada: An Agenda for Economic Renewal", 8 November 1984.

> What we have in the end is a classic substitution. Raise the price too much and you encourage substitution.
>
> *Proceedings*, 14 September 1988, p. 24

> Surimi-based products in the U.S. market have skyrocketed from virtual obscurity to front-page news in the past three years... Surimi analog products promise to have more impact on the seafood industry than fish sticks did 30 years ago.
>
> *Seafood Business*, May/June 1986, p. 40

It is axiomatic to say that the region can no longer afford to export large quantities of unprocessed fish. The benefits to the Atlantic economy from more secondary processing (i.e., value addition) and the diversification to new fishery products include the maintenance and growth in fishery-related employment and enhanced competitiveness.

Specialty seafoods represent enormous prospects for international markets and opportunities abound in addressing the many segments of the North American market (e.g., ethnic, demographic, income, health and life-style, etc.). In Newfoundland, the Committee was shown a breaded shrimp product, made in the United States, distributed from Winnipeg and sold to Newfoundlanders.[1]

Although some Canadian fish processors have done much to enhance the value of their products, the industry is very much behind other food industries. Many are confident that the removal of tariffs under the Canada-U.S. Free Trade Agreement (FTA) on processed fish destined for the United Stats will create a suitable environment for more value addition in Canada.

Not all value-added opportunities, however, relate to extensive processing. For example, in the fresh fish trade, Canadian groundfish suppliers have increasingly supplemented the limited supplies in the United States, thereby improving the overall profitability of the industry. As well, lobster processors are increasingly selling live animals because of the higher profit margins that can be obtained in this way.

The need to upgrade the product mix for groundfish is a formidable challenge. Since the advent of freezing, much of the cod catch has been sold in frozen blocks destined for the United States to be made into fish sticks and other similar items for the deep-fried food line. Market segments which use commodity-type products are generally price-sensitive; the high price of Atlantic cod in 1988 encouraged many school cafeterias and fast food outlets in the United States to substitute cod with Alaska pollock and South American hake. Continuing and marked improvements in quality have made these species an acceptable alternative to Atlantic cod.[2]

Events of the past year in the United States market and the consumer trend away from batter content fishery products to lighter preparations (e.g., baked or broiled)[3] indicate that a major marketing effort is required to reposition cod. As one witness put

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 42, 28 May 1988, p. 10.
[2] *Ibid.*, Issue No. 50, 14 September 1988, p. 24.
[3] *Ibid.*, p. 27.

it: "We should be trying to position cod near the halibuts, the haddocks and the salmons."[1] Obviously, Canadian processors will also have to focus on convenience (e.g., oven-ready entrées, prepared meals) and premium quality if they are to face up to competition in higher priced segments of the market (i.e., competition from Scandinavian producers) and thus avoid unacceptably low returns. Should they fail, long-range profitability will seriously suffer. Once again, the Committee was told that this would require some form of marketing assistance.

The very large volumes of male capelin and herring carcasses generated by the roe fishery represent still another test for the industry's marketing ingenuity. Although most of the world's supply of capelin is being processed into fish meal and oil, the fish is considered to be high in nutritional value; when dried and cured, it is relished by the Japanese.

Another possibility is the production of surimi, which has been described as the soya bean of the 1980s. Initiated in Japan centuries ago as a method of fish preparation, surimi is a processed protein derived from deboned fish which has been washed with large quantities of water.[2] Surimi is used for making seafood analogs (e.g., simulated crab legs, lobster claws) and can be used as a protein additive in other foodstuffs. Although existing technology uses groundfish as the main raw material, recent developments indicate that the flesh recovered from trimmings and frames can be used, and that the technology can be adapted to some underharvested species on the East Coast, such as capelin, mackerel, herring, sandlance and other fatty fish.[3] According to one estimate, if only 20% of the raw material available on the East Coast in 1987 (by-products from existing groundfish plants and certain underharvested species[4]) were used in the production of surimi, the value generated would have been close to $82 million.[5]

Major surimi development programs are underway in the United States, New Zealand, Scotland, Norway, Denmark, the Faroe Islands and the Soviet Union.[6] In Canada, developmental work has been conducted at the Technical University of Nova Scotia and the Marine Institute and Memorial University in Newfoundland. During a visit to the Boston Seafood Show, Committee members tasted surimi crab made by a Newfoundland company (Terra Nova Fisheries), which pioneered production five years ago using small cod unsuitable for processing into traditional product forms. The Committee also learned that Canada has been less agressive compared to other countries, especially the United States, in developing surimi on a major scale.[7]

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(1) *Ibid.*

(2) Department of Fisheries and Oceans, "Surimi Development," Atlantic Fisheries Development, Supply and Services Canada, 1987.

(3) Fatty fish are characterized by dark flesh, strong flavours and odours, high oil content, and tend to deteriorate rapidly after being caught. "Fatty Fish: A New Source for Surimi?", *Seafood Processing and Packaging*, Spring 1989, p. 14.

(4) Redfish, silver hake, small Newfoundland trap cod, dogfish, sandlance, capelin, mackerel, herring and grenadier.

(5) Department of Fisheries and Oceans, "Surimi Development" (1987).

(6) *Ibid.*

(7) Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 39, 24 May 1988, p. 84.

In Alaska, the increase in surimi production by American companies has played a major role in the so-called "Americanization" effort. Accordingly, the growth in American demand has been spectacular.[1] Domestic production of surimi-based seafoods exceeded imports in the United States for the first time in 1987. Consumption reached 52,000 tonnes in 1988 and is expected to exceed 58,000 tonnes in 1989, or about 20 times the amount eaten in 1980. It is expected to grow at a rate of 15% in the next few years.[2] Virtually all the surimi used in North America is made from Alaska pollock.

Although it recognizes that the private sector must take the lead in the area of product development, the Committee nonetheless recommends:

(28) That government provide the financial assistance necessary to help existing small- and medium-sized fish plants to become better equipped in producing value-added products;

(29) That research and development in surimi processing be stepped up and funded jointly by government and industry. The federal government should, within the context of sound resource management, encourage the development of a surimi industry in the region based on discards from fish processing and underharvested species of fish.

AQUACULTURE

> I think it is true to say that we are the state of the art in aquaculture. This is based upon our technology, not necessarily upon our level of growth.
>
> *Proceedings*, 3 May 1988, p. 22

> The orderly and responsible development of markets in aquaculture is essential ... Worldwide aquaculture production is exploding and eventually a settling-out process is bound to occur.
>
> *Proceedings*, 9 May 1988, p. 14

> Though many factors constitute success in Atlantic salmon aquaculture, an effective strategic marketing plan addressing branding, product development, service and quality is essential for long-term success.
>
> *Proceedings*, 20 June 1988, p. 41

The expansion of aquaculture in Canada has been fuelled by favourable market conditions and the prospect of high returns for investors. A recent study commissioned by DFO projects future growth both in terms of production and employment for the Canadian industry (Table 26). These forecasts, however, depend on the ability of Canadian producers to remain competitive.[3]

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[1] Richard Lord, "USA: The Marketplace", *Seafood International*, February 1988, p. 25.
[2] Krys Holmes, "Surimi Sales Settle", *Seafood International*, March 1989, p. 31.
[3] Department of Fisheries and Oceans, *Long Term Production Outlook for the Canadian Aquaculture Industry*, Economic and Commercial Analysis Report No. 13 prepared by Price Waterhouse Management Consultants, January 1989.

TABLE 26

CANADIAN AQUACULTURE PRODUCTION AND EMPLOYMENT PROJECTIONS

	Production (tonnes)			Employment (full-time equivalent positions)		
	1988	1995	2000	1988	1995	2000
Salmon						
Eastern Canada	3,250	4,600-11,000	6,000-16,000	170	305-500	215-625
Total Canada	7,750	24,600-41,000	31,000-66,000	920	1,155-2,000	1,265-3,025
Oysters						
Eastern Canada	2,600	3,000-5,000	4,000-9,000	85	100-165	130-300
Total Canada	5,700	7,000-12,000	9,500-22,000	195	230-395	310-730
Mussels						
Eastern Canada	2,000	3,500-5,000	4,000-7,000	135	230-330	250-450
Total Canada	2,000	3,510-5,100	4,050-8,000	135	235-340	260-520
Marine Trout						
Eastern Canada	250	250-1,000	500-2,000	10	10-35	20-75
Total Canada	350	500-2,000	1,000-4,000	15	20-70	40-150
Freshwater Trout						
Atlantic Canada	125	100-200	200-300	10	10-15	15-25
Quebec	250	500-1,000	600-1,500	20	40-80	50-125
Total Canada	2,414	2,800-5,200	3,500-7,300	200	235-425	290-605

Source: Department of Fisheries and Oceans, *Long Term Production Outlook for the Canadian Aquaculture Industry*, Economic and Commercial Analysis Report No. 13 prepared by Price Waterhouse Management Consultants, January 1989, p. 101.

For the farmed Atlantic salmon industry, a number of advantages have been cited: close proximity to major North American markets (Montreal, Toronto and the American eastern seaboard); competitive production costs if the sector uses locally manufactured materials and equipment; the potential for additional feed manufacturing capacity from fish waste (e.g., herring carcasses); and the required scientific and technical expertise. During the Committee's hearings, it was hoped that fish farming could be developed in concert with the traditional fishery, and that priority status be given to commercial and native fishermen wishing to enter the sector.

Although aquaculture has the potential for producing long-term economic benefits, particularly in coastal areas of the Atlantic region, a number of constraints to its further development remain. These include: financing and cash requirements needed during the start-up years because some species take a long time to reach marketable size; limited smolt/seed supplies which may impede production in the future; and limited availability of environmentally suitable sites (e.g., for salmon). In some regions, notably in the Bay of Fundy, the growth in the number of net pens for salmon has raised the opposition of herring weir fishermen who fear that such operations may interfere with annual herring migrations.

Environmental issues are also a concern for both traditional fishermen and aquaculturists where the industry is more concentrated. Much of the controversy over

the effects of fish farms on water quality and on the health of wild stocks, and over the chemical effects of hormones and antibiotics used by the industry, is due largely to the lack of comprehensive data or studies. Strong federal responsibility must be accepted, particularly in the areas of preventive veterinary medicine, disease diagnostics, and the monitoring of fish habitats. It was suggested to this Committee that the Department of Fisheries and Oceans should establish a section within its organizational structure to deal specifically with aquaculture and to coordinate the efforts of various other government departments.[1]

Fish farming is gaining momentum throughout the world. A number of countries have outstripped Canada's production. By the end of the century, it is expected that the total worldwide supply will be five to ten times larger than at present, "given the necessary scientific, financial and organizational support."[2] For farmed salmon, production is expected to quadruple, which should result in very competitive markets. This should be of grave concern to Canadian producers since it is not clear whether the increase in supply in the coming years will be matched by a similar increase in demand. The Committee was told that production volumes had already contributed to a drop in world prices. In fact the price of a salmon fillet is now less that that for cod.

Aquaculture production in Canada, which accounted for 3% of total fish landings in 1987 (an increase from about 2% in 1986),[3] continues to lag behind that of other countries such as Norway. The industry is still very much in its initial stages of development in Canada, perhaps because of the abundance of natural stocks, but certainly not because of lack of scientific expertise. Indeed, a number of witnesses reminded the Committee that Canada has been, and still is, very much at the forefront of technology. In fact, the Committee learned that Norway had acquired much of its expertise from Canadian scientists in the mid-1960s.[4]

Norway, the first country to export significant volumes of farmed Atlantic salmon, is currently the largest producer and exporter. That country's production of farmed salmon was approximately 80,000 tonnes in 1988, or about the same as the entire catch of wild salmon stocks in British Columbia[5] (Table 27). Norwegian production is expected to reach 130,000 tonnes in 1989, 140,000 tonnes in 1990, and 150,000 tonnes by 1991. The total holding capacity of individual farms is being expanded, and this could eventually put annual supply at 200,000 tonnes. Accordingly, the marketing effort is being intensified; a marketing council for farmed fish has reportedly budgeted $10 million for this purpose in 1989, a large proportion of which is expected to be spent in the Japanese market.

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[1] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 36, 13 May 1988, p. 38-41. The House of Commons Standing Committee on Fisheries and Oceans in its July 1988 report on *Aquaculture in Canada* recommended the creation of a senior level service, headed by an Assistant Deputy Minister at departmental headquarters to "serve as the coordinative focus for all aquaculture activities, particularly those taking place within the science sector."

[2] World Commission on Environment and Development, *Our Common Future*, 1987, p. 138.

[3] Department of Fisheries and Oceans, *Commercial Aquaculture in Canada*, Supply and Services Canada, 1988, p.5.

[4] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 34, 11 May 1988, p. 116.

[5] Department of Fisheries and Oceans, *Long Term Production Outlook for the Canadian Aquaculture Industry*, p. 15.

TABLE 27

NORWEGIAN SALMON PRODUCTION AND MAJOR MARKETS

	Production (Tonnes)		Markets, 1988 (Tonnes)
1971	98	France	17,000
1975	862	Denmark[1]	12,000
1980	4,153	United States	12,500
1985	28,655	Fed. Rep. of Germany	7,000
1986	45,675	Sweden	3,000
1987*	47,417	Spain	2,900
1988	80,000	Japan	2,300
		United Kingdom	2,500
		Belgium	2,200
		Domestic and other	18,600
		Total	80,000

* Estimated. A plankton bloom was responsible for a loss in production in 1987.

[1] The majority of farmed salmon exported to Denmark is smoked and re-exported to the European Community.

Source: Department of Fisheries and Oceans, *Long Term Production Outlook for the Canadian Aquaculture Industry*, p. 17; *Seafood International*, April 1989, p. 25.

It should also be mentioned that the cultivation of salmon is making substantial advances in other countries (Table 28). As well, intensive research is being conducted into the potential for farming other species, particularly shellfish, which are highly valued because of short supply. Forecasts are that by 1990 the production of farmed shrimp will equal the world's wild harvest. Last year, through aquaculture, China became the leading shrimp supplier in the United States (by weight), and the second major supplier in Japan. In the southern United States, pond-raised catfish is being harvested at a rate of over 150,000 tonnes, primarily to supply the domestic fast food market. In sum, both developed and developing countries are giving high priority to the further growth of their aquaculture sectors.

A dramatic increase in worldwide aquaculture production should make Canadian producers very wary about their future markets and brings the concept of marketing very much to the fore. The industry in Canada must act now to develop an innovative marketing strategy based on market intelligence, quality control and assurance and generic advertising. Oyster and mussel growers on the East Coast have thus far done little to expand sales through promotion.[1] For farmed Atlantic salmon, which is mostly sold fresh or smoked, diversification into premium value-added product forms backed by an effective generic promotion program will be needed. It is noteworthy that success of the Norwegian salmon industry has been attributed to a consolidated approach to exporting and marketing, and industry-funded generic promotions.

[1] *Ibid.*, p. 69, 77.

TABLE 28

FARMED SALMON PRODUCTION (IN TONNES) BY COUNTRY, 1986-1990

	1986	1987	1988	1989	1990[1]
NORWAY	45,675	47,400	80,300	130,000	140,000
SCOTLAND	10,300	12,700	18,000	28,000	35,000
CANADA	1,026	2,515	10,300	19,000	28,000
JAPAN	7,554	12,227	14,060	17,080	22,000
CHILE	1,000	2,900	3,200	6,500	14,500
OTHER[2]	3,829	10,046	13,940	24,040	35,000
TOTAL	69,384	87,788	139,820	224,620	275,000

[1] Estimated

[2] Other salmon farming countries include Ireland, the Faroe Islands, Iceland, Sweden, Spain, Finland, Italy, the United States and New Zealand.

Source: B.C. Salmon Farmers Association, DPA Group in *Seafood Trend*, 30 October 1989, p. 2.

In Canada, government support should be provided to analyze market trends and opportunities and to contribute to developing brand image, given that competition will intensify in the future, and that some world producers have already established firm market acceptance for their products.

The Committee recommends:

(30) That the Department of Fisheries and Oceans undertake a detailed assessment of the effects of aquaculture operations on the marine environment;

(31) That the Department of Fisheries and Oceans create a senior level service headed by an Assistant Deputy Minister to coordinate all aquaculture activities. The federal and provincial governments should fully coordinate their efforts to ensure the orderly development of the sector. Both levels of government should develop a clear policy towards aquaculture based on well-defined goals, careful planning and regulation, and public and industry consultation;

(32) That the transfer to the Canadian industry of new aquaculture technology, particularly that relating to high value species, be effected as quickly as possible;

(33) That federal agencies increase their support of the industry by cost-sharing market research studies and by assisting the aquaculture sector in developing promotional and market development programs. An assessment of world farmed-salmon production and markets should be undertaken by a federal government-industry team to establish the relative performance of the Canadian aquaculture industry in terms of its production cost and market acceptance for its products.

ENSURING PRODUCT QUALITY

> Quality is not an end in itself. It is a means to higher net market returns from the resource.
>
> *Task Force on Atlantic Fisheries,* p. 263

> The best thing that ever happened to the fishery . . . dockside grading. For some reason, that fell by the wayside . . .
>
> *Proceedings*, 28 May 1988, p. 59

In recent years there have been marked improvements in quality, from the raw material to the finished product. Processors who heed the quality-related demands of the marketplace have been better able to cope with the drop in prices which has been observed to be generally more severe in average and lower quality products. The trend in demand for seafood is definitely towards premium product forms.

The Committee heard witnesses state that market preference for high quality fish had not been effectively passed on to fishermen in the form of correspondingly higher prices. In Newfoundland, for instance, prices are negotiated between representatives of the processing sector and the fishermen before the harvesting season. The agreed price for a certain species to be delivered by the fishermen is fixed without regard for above average or superior quality.

It is now well-recognized that the quality of plant production depends not only on worker skill, but also on the quality of the landed fish. It has been demonstrated in actual field conditions that dockside grading with price incentives for premium quality landed fish can result in better product, less processing waste, increased yields and lower unit production cost. No consensus, however, has been reached insofar as implementing mandatory bleeding, gutting, icing and washing groundfish at sea, with simultaneous and matching provincial legislation applied at the point of dockside sale. Recognizing that this critical element affects, perhaps more than anything else, the quality of fish, the Minister of Fisheries and Oceans formed a Committee of Provincial Ministers of Fisheries in November 1986 with the specific task of formulating a course of action. Among its recommendations was that gutting and bleeding of groundfish at sea is an integral component of improving quality, and that the industry must be encouraged to implement these measures. Also suggested was that voluntary raw material grading by industry must continue to be promoted since, when mutually agreeable to buyers and sellers, this practice would undoubtedly enhance the ability of fishermen and processors to produce more consistent products.

The Task Force on Atlantic Fisheries proposed final product quality grades, to be shown on corresponding labels, as a potential marketing tactic. After consultation and analysis, however, DFO and industry (processors) concluded that such grading would

not lead to improved market returns. It was further stated that product with a Grade "A" designation, under the proposed program, would only receive the current market price while all other grades would fetch discounted prices. This Committee, however, believes that end product grade standards which would permit the consumer to differentiate between standard and premium quality fish could be a key aspect in successfully marketing Canadian fish.

The federal government's fish inspection program is a truly comprehensive system that has enabled DFO to work with industry to improve fish product quality and has earned high marks internationally. It is significant that seafood exporting and importing countries have adopted Canada's fish inspection program as the standard for quality assurance. Thailand, for instance, availed itself of DFO's assistance through the Canadian International Development Agency (CIDA) in setting up its own system, including the training of personnel. By strictly adhering to the disciplines required by the system, Thailand has drastically reduced rejections of its seafood exports. Market acceptance of its fish exports to Europe and the United States has reportedly been enhanced by their claim of using "Canadian" fish inspection procedures.

In light of the favourable response of the international marketplace to the reliability of DFO's Fish Inspection Program, the Committee recommends:

(34) That the Fish Inspection Program be used as a marketing tool to create awareness among domestic and international consumers that Canadian seafood has undergone the most stringent quality control system in the world;

(35) That industry and government seriously reconsider the establishment of: (a) a system of dockside grading; and (b) finished or end product grades and labels so that consumers can readily identify differences in fish quality. The Department of Fisheries and Oceans should encourage East Coast fishermen to improve fish handling techniques, such as gutting, bleeding, washing, boxing and icing, at sea.

ADVERTISING AND PROMOTIONS

> We were urged to recommend that the Department financially assist the carrying on of an extensive and systematic campaign of advertising fish. It was stated that a similar campaign some years ago, to which the Dominion Government had made a substantial contribution, had resulted in largely increased sales... There is no doubt but that judicious advertising promotes an increased demand for the product advertised... Special attention should be paid to the advertising of the food value of fish products.
>
> *Report of the Royal Commission Investigating the Fisheries of the Maritime Provinces and the Magdalen Islands*, May 1928.

> Studies have shown consumers tend to regard fish and seafood as a great restaurant meal...and something that requires a great deal of expertise to prepare. Consumers are typically uncertain about the risk and difficulties of home preparation. We have to remember that only in coastal regions are people traditionally familiar with seafood.
>
> *Proceedings*, 12 May 1988, p. 64

> We are not doing nearly enough. This industry is extremely fragmented. Other industries, like beef and poultry and pork, are able to obtain check-off systems...

> We don't do this in the fishing industry... The other protein producers have tens of millions of dollars each year at their disposal... There has to be a program whereby industry makes regular contributions to generic promotion.
>
> *Proceedings*, 13 May 1988, p. 17

Canadian companies regularly participate in major international seafood shows such as SIAL in Paris, Foodex in Tokyo, Anuga in Cologne, and the Boston Seafood Show, the industry's premier marketing event. These shows not only offer excellent opportunity for contacting existing or potential buyers and gathering market intelligence (e.g., on new product and packaging trends), they provide excellent publicity for Canadian fishery products at the wholesaler and distributor level. Although impressed with the product displays of Canadian seafood companies at the Boston Seafood Show in 1987 and 1988, the Committee notes that Canada's presence was perhaps not as well coordinated (e.g., individual company booths were dispersed throughout the exhibition) compared to that of other countries, which tended to present unified promotional themes. As well, trade show advertising is not addressed to consumers directly.

Although having always had a good reputation as a healthful food, fish has become a popular protein source, thanks to the results of nutrition research and books promoting its consumption. More than any other food in the 1980s, seafood has been linked with fitness and health. The large food service chains have done much to enhance consumer awareness of seafood, as has advertising of private brands by larger fish processors at the retail level.

There is little doubt, however, that Canadian seafood needs more generic advertising in Canada itself, where consumption of fish products is among the lowest in the industrialized world. Generic promotions are especially important in preventing the consumer from switching to competing or substitute products. It seems that consumers in Canada, while generally informed about the nutritional and healthful attributes of seafood, are not well informed about its ease of preparation and value for money when compared with boneless cuts of meat.

A number of methods of promoting the consumption of seafood in Canada were mentioned by various witnesses from the food service and retail sectors. Such methods included publishing more educational information on the nutritional benefits of eating seafood, on the characteristics of high quality fish, and on the handling and preparation of fish, especially fresh fish. Canadians must be made more aware that the preparation of seafood is simple and convenient, especially when a microwave is used, and can be faster than preparation of fast foods.

Many believed that promotional programs should be emphasized throughout the year, not just during Fish and Seafood Month in November, a time when frozen and imported products are almost the only fish products available. As well, the importance of the ethnic consumers in the Canadian market was repeatedly mentioned; these consumers may be "opinion leaders" in that many have shown an interest in introducing fish and seafood to other Canadians. It was also suggested that relevant educational programs be introduced, starting in the elementary schools and continuing through high school, especially in the field of home economics.

All of Canada would greatly benefit if more emphasis were placed on educating the consumer; consumers' health would benefit from a diet of more fish and seafood, retailers and wholesalers would experience increased demand, and fishermen and processors would have more domestic sales and outlets for their products.

If the real power in promotion is money, Canadian seafood's share of consumers' attention is clearly inferior to that of other protein foods such as cheese, eggs, dairy products, beef, etc. Contributions made by the federal government to the Fisheries Council of Canada to undertake the promotion of seafood domestically amounted to $700,000 in fiscal year 1987-88 and $800,000 in 1988-89.[1] In contrast, the Committee was told that the Egg Marketing Board has an ongoing promotional budget of some $6 million annually, while the Dairy Bureau spends over $13 million on generic advertising.[2] In the United States, the beef industry reportedly spends an estimated U.S. $40 million a year on promotion.

It should be noted again that Atlantic cod is being pushed out of the limelight in the American market by a number of newer types of seafood. As a result, the North Atlantic Seafood Association (NASA), made up of producers from Norway, Denmark, Iceland and Canada, recently banded together in what has been termed "one of the biggest generic campaigns ever mounted for a single species."[3] The objective is to make North Atlantic cod stand out from lower-priced competing species by enhancing its image in the eyes of the consumer. Canadian cod products, like other species, however, continue to lack industry-based advertising.

The Kirby Task Force recommended that the federal government commit funding for a five-year campaign of generic promotion of Atlantic groundfish and herring products in North America and Europe.[4] The total federal contribution in 1982 dollars would have been $25 million phased over five years. Thereafter, federal funding would have returned to about $400,000 a year. The Task Force envisioned an industry levy on domestically produced products and competing imports to replace federal funds as processing became more profitable. The proposal, however, was not implemented; in the absence of Product Marketing Councils, no federally funded generic promotion was undertaken in North America or Europe. What was to be a five-year $7.2 million domestic promotional campaign organized by DFO, starting in 1983-84, was wound down in 1985-86 after an expenditure of $5.5 million.

Under a privatization initiative in 1986, DFO stepped back from marketing and abandoned its Marketing Directorate; the federal government ceased to be directly involved in generic seafood advertising. An agreement was reached with the industry for the eventual privatization of generic promotion via a transition period of joint government/industry funding. A group of Canadian companies subsequently took up the challenge and formed the Canadian Seafood Advisory Council (CSAC), whose programs, because of limited funds, were aimed primarily at the trade. The approach has consisted of promoting the month of November as "Seafood Month," publishing promotional materials, awarding Neptune awards for excellence in merchandising at

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[1] Department of Fisheries and Oceans, *1989-90 Estimates, Part III, Expenditure Plan*, p. 105.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 29, 15 March 1988, p. 6.

[3] "Cod Moves Upward," *Seafood International*, May 1989, p. 49.

[4] To be carried out by Product Marketing Councils.

the retail and service levels, and maintaining a toll-free cross-country bilingual telephone line (the Seafood Information Centre) to answer questions about all aspects of seafood (e.g., types, availability, nutritional information, handling and storage tips, recipes, merchandising ideas).

During the Committee's hearings, the Canadian seafood industry was criticized for failing to advertise sufficiently not only in Canada but in the whole of North America as well. Some witnesses echoed the conclusions of the Kirby Task Force on this topic:

> Because Canadian firms produce relatively undifferentiated groundfish commodity products, it does not pay the individual producer to advertise; buyers already know that there is no difference between the products of different suppliers. Any growth in total sales as a result of advertising will thus be shared among all suppliers. This is called the "free rider" problem... The advertising approach adopted by the egg, dairy and beef industries addresses the problem of undifferentiated products through generic advertising. In effect, the producers in these industries compete as a group against all other proteins for a share of consumers' purchases.
>
> The Atlantic industry's ability to launch an effective generic advertising campaign has been limited by its inability to raise funds from all the beneficiaries and by the absence of a stable budget and management focus to provide continuity and follow-through. In addition, the industry is not generally able to afford substantial expenditures on market development or improved distribution.[1]

In the United States it is noteworthy that consumers have questioned the safety and integrity of the American seafood supply following reports on the state of the marine environment in that country. One such report in a New York newspaper in August 1988 featured a photograph of a fish on a beach with a hypodermic needle in its mouth.[2] Unfortunately, the image of all seafoods, including those harvested in Canadian waters, was affected.

Retailers and industry organizations in the United States have begun to advertise and promote their products on a generic basis to counteract the negative press. In 1989, $U.S. 6.5 million will be spent on encouraging consumers to eat fish and seafood twice a week.[3] At the same time, a National Fisheries Institute is developing a comprehensive educational campaign to educate the trade and media about seafood safety.[4]

A demonstration of what a generic consumer advertising campaign can achieve took place in Canada in 1988. To repair the damage to the Canadian seafood market caused by the mussels incident of December 1987 and the confusion regarding the safety of other types of shellfish, the federal government contributed $1.1 million toward a program to rebuild consumer confidence. This amount was matched by the member associations of the FCC, along with Quebec and the Atlantic provinces. The

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[1] Task Force on Atlantic Fisheries (1982), p. 159, 292.

[2] *New York Times*, 29 August 1988, p. A17.

[3] The American *Fish and Seafood Promotion Act* provides for the establishment of a National Fish and Seafood Promotional Council (NFSPC) and Product Specific Councils. These are funded by appropriations granted by the U.S. Congress.

[4] Nancy Hasselback, "From the Publisher: Ground Must be Regained", *Seafood Business*, Vol. 8, No. 3, May/June 1989, p. 4; "The National Fish and Seafood Promotional Council", *Seafood Business*, Vol. 8, No. 6, September/October 1989, p.59.

campaign, which had the theme "Canadian seafood — number one in the world," consisted largely of television advertising in major Canadian food consumption areas over a six-week period, press and trade briefings, and specific trade promotions in retail outlets and restaurants. Although short-lived, according to the FCC, the campaign was successful:

> We analyzed the results in August [1988], compared to the impact in January [of that year]. In August, we found: (a) consumers increased their purchases of fish and seafood compared to January; (b) restaurant consumption of fish and seafood was *up considerably* compared to January; and (c) *70%* of the people surveyed stated that the FCC campaign was effective.
>
> In summary, the overriding theme of the campaign . . . worked. Trade acceptance of the point of purchase materials was excellent. The public relations stories were positive and seafood is back on its upward trend.[1]

In Norway, a special program financed by the government to promote domestic fish consumption reportedly increased per capita consumption to about 40 kilograms in 1987 (the objective set for 1990), up from an estimated 30 kilograms in 1980 and 36 kilograms in 1983.[2]

Generic domestic and foreign promotions aimed at creating market opportunities for Canadian fish are essential in persuading seafood consumers to think of Canada as the world's number one supplier of top-quality seafood products. Generic advertising should be a continuing and sustained effort. In fact, Canada's position as one of the world's top seafood exporters is at risk if this country allows aggressive newcomers to make inroads into its established markets. A marketing effort is also needed to make underutilized species of fish known and accepted by the traditional consumer.[3]

The Committee recommends:

(36) That the federal government enlist the wider support of the East Coast fishing industry in funding generic promotion of the region's fish products domestically and internationally. A means of self-assessment should be introduced to finance future generic advertising. Any federal funding should be provided on a cost-shared basis. In Canada, the federal government should enlist the funding support of private and public organizations concerned with diet and health issues. Future promotions should include educational materials for the general public, and should cover new products and species;

(37) That government support any industry attempts to mount a national trade show to introduce East Coast fish processors to retailers and food service operators from other regions of Canada. The Department of External Affairs should work toward expanding Canadian industry participation at international trade shows. A more unified Canadian presence should be sought where government funding is involved.

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(1) Fisheries Council of Canada, *Bulletin*, December 1988, p. 1.

(2) The Organisation for Economic Co-operation and Development, *Review on Fisheries in OECD Member Countries 1987*, Paris, 1989, p. 27.

(3) In some cases, there is a need to establish acceptable names for underutilized species to make them more appealing to consumers (e.g., dogfish, a popular species in England for making fish and chips, is now appearing on the menus of fine restaurants as "mako shark").

TRADE ISSUES

> [The New England seafood industry is] mad as hell about [the Canada-U.S. Free Trade Agreement]. They think they got shafted by the Canadians and that we got all of the advantages. You know something? They are right... They know who won. We won.
>
> *Proceedings*, 14 September 1988, p. 49

> Is access to markets or to the resource being liberalized?
>
> *Proceedings*, 17 June 1988, p. 18

> ... As far as I'm concerned, free trade is no miracle solution.
>
> *Proceedings*, 16 June 1988, p. 24

Long before contemporary boundaries were drawn, the international saltfish trade linked the East Coast of Canada to Europe and the Caribbean. The Canadian fishing industry continues to be highly dependent on foreign markets. In terms of imports, Canada maintains a relatively open trading regime for fishery products and one of the world's lowest tariff rates. As one of the world's leading exporters of fishery products, it stands to reason that the fishery would benefit from reduced impediments to trade, which can assume many forms (e.g., tariffs, import licensing regulations, global import quotas and prohibitions, government procurement policies, administrative measures). Australian import regulations on fresh and frozen salmon imports, for example, effectively prohibit Canadian sales to that market on alleged health grounds. (The Australian rationale is that this restriction prevents the spread of salmonid diseases to trout farms.)[1]

Japan has maintained long-standing protectionist trade policies. High tariffs and global import quotas have made it difficult for a relatively unknown product, such as Canadian cod, to become established in that market. Similar barriers on frozen Atlantic herring and herring roe and capelin may also be limiting trade in Canadian pelagics. On the other hand, strong consumer demand has ensured that Canadian shellfish exports to Japan and other major markets have not been significantly affected.[2]

The ability of Canadian seafood producers to penetrate the EC is hampered by preferential tariff and quota arrangements granted to individual Scandinavian countries (Iceland and Norway) and by minimum import or reference prices on most fishery products.[3] By 1992, the Community is expected to become a single market (with 325 million consumers) which will have no barriers to the internal movement of capital, goods, services or people among its 12 member states. Areas which could affect the fisheries sector include possible changes to EC tariffs and import quotas, consumer packaging/labelling requirements and inspection standards.

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[1] Canada recently achieved liberalization of a similar ban in New Zealand on smoked salmon.

[2] Department of Regional Industrial Expansion/Ministry of State for Science and Technology, *Fishery Products* (Industry Profiles on Atlantic Groundfish, Pelagics and Shellfish), Supply and Services Canada, 1988.

[3] Imports which do not meet domestic price levels are denied entry or face offsetting surcharges.

Clearly, the use of broad policy instruments such as trade liberalization under the auspices of the General Agreement on Tariffs and Trade (GATT) is important if Canadian seafood producers are to be successful in securing existing markets and entering new ones. In this connection, many believe the Canada-U.S. Free Trade Agreement (FTA) can provide the impetus for the liberalization of global trade in fishery products under the GATT.

Canada's bilateral trade relationship with the United States, generally, and the Canada-U.S. Free Trade Agreement (FTA),[1] in particular, was the subject of sometimes intense debate during the Committee's hearings. Proponents of the Agreement deemed it essential to ensure the fishing industry's long-term prosperity. Opponents of the Agreement, on the other hand, painted a dramatically different picture of its possible implications.

The provisions of the Agreement can perhaps be best understood as having two main components: those that deal with tariffs, and those that have to do with non-tariff barriers, namely the anti-dumping, countervail and injury suits that American firms can bring against foreign competitors.

Tariffs between Canada and the United States are to be eliminated in accordance with a set schedule. For example, tariffs on fresh and frozen flatfish (excluding fillets) were eliminated on 1 January 1989 (Table 29). Tariffs on fresh and frozen groundfish fillets and salmon are to be removed over five years in five equal steps. The real impact of the FTA, however, is not expected to be felt until 1998 when all tariffs on fish sticks and portions, prepared dinners and other value-added products are finally removed.

Some witnesses pointed to American import duties on processed groundfish as having in the past discouraged Canadian production for export and encouraged cross-border investment in processing facilities in the United States. A large proportion of Canadian groundfish enters that country as raw or semi-processed material which then undergoes further processing to be made into fish sticks and other similar products. Once the tariffs on these products are lifted, it is not inconceivable that Canadian processors, especially smaller companies which do not have American subsidiaries to circumvent tariffs, will put more effort into the preparation of finished products in Canada. Some pointed to the advantages, in terms of quality, that result from processing fish where it is harvested. Others, however, believed that plants in proximity to major markets are better able to respond quickly to changes in market demand.

As for groundfish, some witnesses argued that the removal of tariffs on Atlantic pelagics and shellfish, particularly the higher ones on processed products, would result in an expanded and value-added product mix. Indeed, an important way to salvage employment in the fishery would be to do more domestic processing.

According to federal government estimates, $444 million or 32% of the total value of Canadian fishery exports to the United States were subject to American duty in 1985. Approximately 15% of American shipments into Canada (valued at about $40

[1] The Agreement was signed by the President of the United States and the Prime Minister of Canada on 2 January 1988. It was subsequently implemented by appropriate legislation in both countries and came into force on 1 January 1989.

TABLE 29

TARIFF ELIMINATION SCHEDULE FOR KEY FISHERY PRODUCTS

Tariff Elimination Schedule	Canadian Imports From U.S., 1985 ($000)	Canadian Exports To U.S., 1985 ($000)	Canada Duty Rate[1] (%)	U.S. Duty Rate[1] (%)
Immediate				
Fresh/frozen flatfish (excluding fillets)	2,200	16,300	free	1.1 (¢/kg)
Fish meal	193	8,600	5	0 to 6
Fish oil	283	4,800	7.3 to 7.5	0 to 5
Five-Year				
Fresh/frozen groundfish fillets	11,798	266,300	free	4.1 (¢/kg) or 6
Salmon	19,200	5,300	3	3 to 12
Clams	223	770	10	3.5 to 14
Ten-Year				
Tuna	274	0	7 to 14	1.1 (¢/kg) or 35
Fish sticks	10,306	7,478	11	10 to 15
Prepared meals			6 to 17.5	10
Sardines	111	6,200	2 (¢/kg) or 11	2.5 to 20
Herring	17	140	8	4 to 8
Crab	14,900	53,800	8 to 8.2	5 to 11

[1] Annex 401.2 of the Canada-U.S. Free Trade Agreement provides more detailed information on the specific tariff item number and article description for particular products. Duty-free goods prior to 1 January 1989 continue to receive their duty-free treatment.

Source: Department of Fisheries and Oceans, *The Canada-U.S. Free Trade Agreement and Fisheries: An Assessment*, Supply and Services Canada, 1988, p. 22.

million) were subject to duty. Prior to 1 January 1989, the United States' list of products on which tariffs applied was longer than Canada's. In theory, the Canadian fishing industry has been much less protectionist than the U.S. industry and therefore has more to gain from the elimination of tariffs. Such an analysis, however, may be too limited; concerns were expressed during the Committee's hearings over the possibility that American interests, particularly the New England industry whose employment and investment greatly relies on Canadian semi-processed materials, would in the future demand some form of compensation from Canada in exchange for its concessions on tariffs. Some feared that the United States would want to access the resource at some point in time, either by direct investment or by pressuring the federal government to alter the methods by which fisheries are managed in Canada, or both. Although the federal government earlier this year reaffirmed its policy prohibiting the issuance of fishing licences to any firm with more than 49% foreign ownership, the text of the FTA

maintains a silence on fisheries management issues that many in the Canadian industry expected to see addressed.

Unlike managers in the United States (e.g., under the area administered by the New England Fishery Management Council), Canadian fisheries managers try to ensure a relatively steady fishing effort. The method used is one of controlled access, and both social and economic considerations are taken into account in setting quotas. By contrast, the United States does not have a quota system for its Atlantic fisheries; management has taken the form of regulating mesh size of fishery nets, minimum fish sizes, and the closure of certain areas to permit spawning. Enforcement efforts have reportedly been erratic,[1] and it is certainly no secret that the Americans have overfished on their side of the boundary line. One witness before the Committee, the Chief of the Research Division of DFO's Quebec Region, described the fisheries regime in the United States as follows:

> The management policy in the United States is one of free or wild development, depending on how you want to describe it. Anyone who wants to fish can. It's a free enterprise system. If you want to go bankrupt, it's your choice.
>
> This policy leads to overfishing of stocks, and one of the main reasons why American fishermen have difficulty in competing with Canadians is that they have overfished their resources and there is not much left to catch. So, it's enormously expensive for them to go and catch the little amount of fish that is left.
>
> The Georges Banks, which was one of the most productive areas in the world before it was overfished, no longer has large biomasses of cod, herring and haddock. None of these species are left. There is a biomass present, but it is of skate, lance, dogfish and the like.[2]

During its hearings on the West Coast, the Committee learned that a group of American fish processors had filed, in April 1986, a petition under section 301 of the *Trade Act*.[3] The petitioners contended that the processing requirements for exports from Canada of herring and sockeye and pink salmon, then under Canada's *Fisheries Act*, placed U.S. processors at a disadvantage with their Canadian competitors.

Canada's rationale for having export restrictions on unprocessed salmon and herring was to recover some of the costs incurred by Canada in managing these stocks and their habitats.[4] Of concern to the Fisheries Council of Canada when it appeared before this Committee in 1986 were the possible adverse effects American trade "offsets" might have on Atlantic seafood trade flows.[5]

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[1] Allan R. Gold, "Overfishing is Depleting a Rich Fishing Area," *The New York Times*, 19 June 1989, p. A13.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 25, 3 February 1988, p. 89.

[3] Section 301 authorizes the U.S. President to take action against practices of other countries which the U.S. government considers burden, restrict or discriminate against U.S. commerce.

[4] Standing Senate Committee on Fisheries, *The Marketing of Fish in Canada: Interim Report II*, December 1987, p. 65.

[5] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 1, 4 November 1986, p. 10.

In March 1987, the United States requested the establishment of a GATT panel. Its report, released in November 1987, found that Canada's restrictions were inconsistent with the GATT. The Canadian government subsequently did not oppose the GATT panel ruling when it went before the full Council of GATT in March 1988; its initial position was to replace the offending export regulations by a national landing and grading requirement (all Canadian Pacific salmon and herring would have to be landed in British Columbia and graded, according to "inspection requirements affecting quality, safety and consumer protection"). Canada dropped the grading requirement in April 1989 and proceeded with the implementation of new landing regulations requiring the fish be landed in provincially licensed shore-based stations for sorting, weighing and biological sampling, after which domestic and foreign buyers would have equal access to the unprocessed product.

The Americans objected to these new provisions on the grounds that they constituted unfair barriers to trade. The U.S. Department of Commerce drew up a list of items to use in possible retaliation if the issue were not resolved. This list included fishery products from the East Coast of Canada, a region which relies far more on the American market than does British Columbia. Both Canada and the U.S. agreed to send the matter to a special dispute resolution panel under Chapter 18 of the FTA. The FTA panel in its report of 16 October 1989 suggested that Canada's landing requirement could be considered a legitimate conservation measure if 10 to 20% of the fish were made available directly from Canadian fishermen to foreign buyers without first being landed. The federal government adopted the FTA panel's report on 6 November 1989. Many believe that the 10 to 20% rule will be difficult to implement and monitor, costly to enforce and provides the incentive to cheat.

Fish processors and fish plant workers on the West Coast of Canada are convinced that, in the absence of a processing requirement and because of lower production costs in other countries such as Japan and the United States, British Columbia firms will be outbid, thus placing the industry's profitability and shore-based employment in jeopardy.

Although Article 1203 of the text of the FTA would seem to exempt controls by Atlantic provinces on the export of unprocessed fish,[1] Article 1205 reaffirms American rights and obligations in respect of GATT. Furthermore, the terms of FTA implementation legislation in the United States state that:

> (e) Canadian Controls on Fish
>
> (1) Within 30 days of the application by Canada of export controls on unprocessed fish under statutes exempted from the Agreement under Article 1203 of the FTA, or the application of landing requirements for fish caught in Canadian waters, the President shall take appropriate action to enforce United States rights under the General Agreement on Tariffs and Trade that are retained in Article 1205 of the Agreement.

[1] These include the *New Brunswick Fish Processing Act, 1982*, and *Fisheries Development Act, 1977*; the *Newfoundland Fish Inspection Act, 1970*; the *Nova Scotia Fisheries Act, 1977*; the *Prince Edward Island Fish Inspection Act, 1956*; and the *Quebec Marine Products Processing Act (No. 38), 1987*.

(2) In enforcing the United States rights referred to in paragraph (1), the President has discretion to —
(A) bring a challenge to the offending Canadian practices before the GATT;
(B) retaliate against such offending practices;
(C) seek resolution directly with Canada;
(D) refer the matter for dispute resolution to the Canada-United States Trade Commission; or
(E) take other action that the President considers appropriate to enforce such United States rights.[1]

It is unclear whether or how provincial fisheries regulations on the East Coast will be affected by the October 1989 FTA panel ruling on West Coast salmon and herring (e.g., whether the provincial regulations can be challenged by the United States under the GATT on the basis of that ruling).

Another related area of contention between Canada and the United States is, of course, that of "subsidies." Under Articles 1906 and 1907 of the FTA, both countries agreed to establish a Working Group to negotiate over the next five or seven years a new set of rules aimed at eliminating unfair trading practices at the level of prices and government subsidies. In recent years, segments of the American industry have initiated a number of investigations claiming that the Canadian fishery is highly subsidized by government and is therefore an unfair competitor. In May 1986, for example, the U.S. International Trade Commission launched an inquiry arising from Canadian exports of fresh whole groundfish. A countervailing duty of 5.82% was fixed against Canada as a result. Although the U.I.C. program for fishermen was not deemed to be a subsidy by the United States, it was ruled that subsidies were involved in some 55 federal and provincial programs.[2]

In this regard, it is hoped that the dispute settlement mechanism mandated by the FTA will provide the fishing industry in Canada with a speedier, fairer and more effective means of defending itself against arbitrary and capricious anti-dumping and countervailing actions against it. Indeed, it is the contention of the Government of Canada and the Canadian fishing industry that in past cases, American trade laws were not correctly applied.

> Provision has been made in the Agreement for an impartial binational panel to be constituted whenever either party considers that countervail or anti-dumping laws have been unfairly applied. For example, in [the case of fresh whole groundfish] . . ., the Canadian industry protested the imposition of countervailing duties by the United States . . . on the basis that:
>
> a) it had not been determined, as required by U.S. trade law, that the petitioner was fully representative of American industry interests on the issue;

[1] United States, *United States-Canada Free Trade Agreement Implementation Act of 1988*, Title III, Section 304.

[2] Some of the programs found countervailable have since been terminated or have undergone substantial modifications.

b) economic assistance programs in Canada were judged to constitute trade subsidies regardless of whether they were generally available to all Canadians or targetted specifically to the fishing sector, or whether they influenced the level of exports;

c) imports from Canada were judged to have injured the U.S. industry without taking into account the fact that much more serious factors such as a declining U.S. resource base were at the heart of the problems facing the U.S. fishing industry.[1]

No less important is the provision in the FTA for harmonizing technical standards between the two countries. On this subject, the Minister of Fisheries and Oceans assured this Committee in April 1988 that marketing difficulties in the United States for Canadian shipments of groundfish, lobsters and scallops, due to various size restrictions imposed by the U.S. federal and state governments, would, under the Agreement, be eliminated.[2] Canadian Crown corporations like the Freshwater Fish Marketing Corporation (FFMC) would be untouched.[3] American subsidiaries established to comply with "buy American" provisions on U.S. federal and state purchases (e.g., armed forces commissaries, school lunch programs), and which require products be processed in the United States, would no longer be allowed, under the Agreement, to discriminate against Canadian suppliers.

The Canadian fishing industry has yet to face the full implications of the Agreement, good and/or bad. The full significance of its articles, which have so far been subjected to varying and conflicting interpretations, will become apparent only over the next ten years. The manner in which binational panels and working groups are implemented will be of critical importance to Canada.

Some would argue that since the seafood industry in New England lobbied against the Agreement[4], from a Canadian fisheries standpoint, its benefits therefore outweigh its shortcomings. It is, however, too early to say this unequivocally. Too many elements are as yet unknown: whether the FTA will increase or decrease trade conflicts between Canada and the United States; whether or how regional development, social or even fisheries management programs will be modified; whether the Agreement will put upward pressure on the Canadian dollar and offset the benefits resulting from tariff reductions; and whether the Agreement will increase the sector's dependence on the American market, with all the advantages and disadvantages that may bring.

Finally, the Fisheries Committee of the Organisation for Economic Co-operation and Development (OECD) recently noted in a study on fisheries issues and trade that member countries were not able to reach a common view on the "nature and extent of

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[1] Department of Fisheries and Oceans, *The Canada-U.S. Free Trade Agree ment and Fisheries: An Assessment*, Supply and Services Canada, 1988, p. 17.

[2] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 30, 19 April 1988, p. 13.

[3] *Ibid.*, p. 20. Article 2010 of the FTA requires notification and consultation prior to the establishment of a monopoly. Both parties to the Agreement are to ensure that sales will not be discriminatory or contrary to the principles of the Agreement.

[4] Canada, the Senate, *Proceedings of the Standing Senate Committee on Fisheries*, Issue No. 50, 14 September 1988, p. 49.

[the] link between resource management, access to resources and international trade" and accordingly were "not able to develop recommendations."[1]

The Committee recommends:

(38) That the Government of Canada negotiate the subsidies code and implement the dispute settlement procedures under the Canada-U.S. Free Trade Agreement in a manner consistent with Canadian expectations and with the interests of the Canadian fish plant workers and fishermen. The federal government should, in no circumstances, make Canada's sovereign right to conserve and manage its fishery resources a trade issue. This Committee is very concerned about the possible repercussions on the East Coast industry of the October 1989 ruling on West Coast salmon and herring by the Canada-U.S. Free Trade panel;

(39) That, in addition to the ongoing review of the implementation of the Canada-U.S. Free Trade Agreement by the Standing Senate Committee on Foreign Affairs, public and private sector groups systematically and closely monitor the effects, both beneficial and adverse, of that Agreement on the Canadian industry;

(40) That the federal government make trade liberalization for *processed* fish products a major priority within the larger context of Canadian international trade policy and within the framework of the General Agreement on Tariffs and Trade. As well as multilateral negotiations, the federal government should actively work to expand trade links through bilateral negotiations to achieve widest possible market access for Canadian seafood. The Canada-U.S. Free Trade Agreement should not be regarded as a substitute for liberalized trading arrangements with other markets such as the European Community and Japan, as pursued on both a multilateral and bilateral basis;

(41) That the federal government continue to pursue its stated policy of separating tariff issues from issues concerning allocations of fish to foreign countries;

(42) That the federal government assess the market/trade impact and implications of "Europe 1992" on the Canadian fishing industry.

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[1] The Organisation for Economic Co-operation and Development, *Fisheries Issues: Trade and Access to Resources*, Paris, 14 April 1989, p. 8. This report is a follow-up of an earlier report entitled *Problems of Trade in Fishery Products*, published in 1985. In this the OECD Committee for Fisheries noted that "given the time permitted and the complexity of the matter," little attention was paid to "the possibilities for further liberalisation of trade." To this end, the OECD Committee for Fisheries examined in 1989 the problem of "access to resources and ways in which the total allowable catch of resources is determined."

CHAPTER VII

Conclusion

> We believe that if your Committee makes the effort, it can gather a host of recommendations from local people actively involved in the industry — fishermen, workers and merchants — and these could be forcefully submitted to federal authorities to make them realize that fishing is our region's basic industry and is just as important to us as oil is to Alberta, wheat to the Prairies, or heavy industry to Ontario and Quebec.
>
> It amazes us, sometimes, to see that as soon as a disaster strikes one of these sectors, the government is always ready to come to the rescue, but when the fishery is hit, either no one shows any interest, or there is a lot of indecision before a solution is proposed, and sometimes these solutions are nothing more than a bandage on a wooden leg.
>
> *Proceedings*, 16 June 1988, p. 62
>
> To be frank, all of us do know why we are here. First, it's to blow off a little steam, and secondly, it's because we still have some hope for the future. While we wait for better days, we have no choice but to let the storm pass over, and hope that it will not destroy everything in its path.
>
> *Proceedings*, 17 June 1988, p. 20

This report sketches the more immediate concerns of the people who contributed to the Committee's inquiry. Most of the matters submitted are in themselves sufficiently perplexing to warrant special and more detailed investigation. The solutions do not lie totally with the industry or government; a collective effort is required by everyone concerned. Problem-solving will require an integrated, multi-disciplinary and realistic view of problems and opportunities.

The Atlantic fishery presents a disturbing paradox. On the one hand, as a result of extending Canada's fisheries jurisdiction to 200 miles in 1977, Canadians own one of the world's great natural resource bases. Seafood is now a valuable commodity and it should become even more so in the coming years. On the other hand, communities that are economically dependent on fishing in the region, with few exceptions, continue to suffer from chronically low incomes and high unemployment. Between the resource and the market is an industry again "mired in financial crisis, plagued by internal bickering,

beset with uncertainty about the future. . ."[1] A legacy of crises and cyclical failures may have led some people to believe, wrongly, that the industry is either backward or an economic burden on the country.

The fishery resource on the East Coast is the common property of all Canadians, all have a stake in its stability and viability. Obviously, you cannot sell fish if you don't have fish. Resource shortages have market implications. Measures to conserve the resource are an essential part of any strategy to market it. An emphasis on conservation makes good business and marketing sense in the long term. If fisheries managers err, they should err on the side of conservation.

The fortunes of the industry depend not only on the availability of fish, but also on markets — trading conditions, changes in currency values, buyer preferences, competition, technology and a myriad of other factors. In many places in this report, the Committee calls for an increase in the incentives to the private sector, small and medium-sized processors. It believes this would brighten the industry's prospects and help keep it on an even keel in a changing and demanding marketplace.

East Coast seafood is one of the most "under-marketed" protein foods produced in Canada. Worse, the industry at the moment is without the promotional programs needed for it to keep pace with its major competitors. Where processors once "sold" fish, they must now "market" products creatively, aggressively and internationally if they are to maintain market share and profitability. Those communities and families whose livelihoods have long depended on the sector deserve no less.

[1] Task Force on Atlantic Fisheries (1982), p. 9.

CHAPTER VIII

Summary of Recommendations

(1) That should the 1987 Constitutional Accord be ratified, consideration be given to amending the Constitution of Canada by moving the subject of fisheries from the agenda of the constitutional meetings to the agenda of the annual conferences of the first ministers on the economy.

(2) That the federal government give higher priority to controlling and reducing all forms of pollution. The responsible federal departments should vigorously promote bilateral and international initiatives to control and prevent freshwater and marine pollution. Federal regulations should be strictly enforced and polluters prosecuted. More stringent laws and regulations must be enacted;

(3) That the Department of Fisheries and Oceans expand and strengthen its research programs on fish habitat in the region. In applying the "no net loss" principle in pursuing its habitat policy, the Department should disallow developments which impinge on fish habitats unless it can be shown, after extensive public input, that such developments are clearly in the interest of Canada;

(4) That the Department of Fisheries and Oceans substantially increase the level of funding for research on new methods of fertility control in seals. If a solution to the grey seal problem is not forthcoming within two years, the federal government should proceed with a cull in accordance with the recommendations put forward in the Report of the Royal Commission on Seals and Sealing in Canada. Meanwhile, a substantial research effort should be undertaken to: (a) assess the population and growth rate of seal stocks and document precisely the losses incurred by the fishing industry due to seals so as to produce irrefutable evidence to show that a cull is necessary; and (b) determine the magnitude of a cull needed to reduce the nematode burden in fish;

(5) That government and industry consider jointly planning and funding an aggressive and direct public relations campaign aimed at countering any future boycotts of Canadian products at home or abroad resulting from the seal management issue;

(6) That the federal government step up sanctions beyond port closures and the curtailment of preferential access to surplus fish stocks within the 200-mile limit to

bring pressure on those countries who overfish the so-called straddling stocks. The Prime Minister, the Secretary of State for External Affairs, and the Minister of Fisheries and Oceans should develop a strategy to establish full functional Canadian fisheries jurisdiction over the whole Continental Shelf;

(7) That the Department of Fisheries and Oceans substantially increase penalties for domestic violators of fisheries regulations. The Department should periodically review and increase penalties if need be so that sanctions greatly exceed potential gains from fishing illegally. Fines should be pro-rated according to the severity of the offence. Fishing privileges should be withdrawn to deter repeat offenders:

(8) That the Department of Fisheries and Oceans adopt measures, such as selected fish plant audits, which would encourage more accurate reporting of catches. The Department should be provided with the resources necessary to enforce its fisheries regulations;

(9) That a major peacetime role of the Canadian military should be the surveillance of Canada's coastlines;

(10) That the Department of Fisheries and Oceans pursue means to improve the frequency and quality of communications between departmental scientists and fishermen and fishermen's organizations. The Department should make available to client groups workshops or seminars on fisheries science and resource management concepts;

(11) That the Department of Fisheries and Oceans take further steps to involve the participation of actual fishermen in the resource assessment, consultative and decision-making process. The Department should take advantage of fishermen's ability to collect data and allow scientists to work on board commercial fishing vessels. Membership on Advisory Committees should be periodically reviewed to ensure the fullest possible involvement of all those concerned;

(12) That the Department of Fisheries and Oceans determine the precise economic effects of harvesting and processing small and immature Atlantic cod;

(13) That the Department of Fisheries and Oceans review the effectiveness of regulations pertaining to fishing gear and their effects on the size of Atlantic cod landed and promote fishing methods, such as the use of square mesh gear, that reduce the harvesting of immature fish. Fishing in areas where there are spawning stocks should be severely curtailed;

(14) That the Department of Fisheries and Oceans significantly increase its support of fisheries research to ensure that it has at its disposal a pool of highly qualified scientists. Additional studies are urgently needed not only to increase the Department's knowledge of the dynamics of individual species and stocks in the region, but also their interaction and interdependencies in the ecosystem;

(15) That federal and provincial government departments and agencies expand the range of marketing services to fishing companies needing professional assistance;

(16) That the Department of Fisheries and Oceans determine the extent of dumping fish and fish waste at sea. Jointly with commercial fishermen, the Department should continue to develop and promote measures to reduce the incidental catch of non-target fish stocks. Every effort should be made to determine possible uses for by-catches;

(17) That federal and provincial government departments and agencies increase the level of financial assistance through regional development programs to companies wishing to develop from fish waste marketable products such as animal feeds, fertilizers and food. Capital investment aimed at obtaining higher yields from harvested fish should be supported. Governments should devise policies which encourage the processing of all usable parts of harvested fish;

(18) That the federal government conduct a comprehensive review of Canada's foreign allocations policy, including its policy on over-the-side sales, so as to document its net benefits to the Canadian fishing industry and economy. The review should include the costs and benefits, in terms of current and potential markets, of further displacing the foreign fishing fleet from the Canadian zone. The results of this review should be made available to the fishing industry;

(19) That the Department of Fisheries and Oceans formulate a national strategy to develop underutilized species and stocks. The Department should establish a product and market development unit in support of the fishing industry, to: (a) identify and provide detailed information on species and stocks which show the greatest potential for development; (b) examine and coordinate research and technological development initiatives; and (c) coordinate the activities of its various branches with those of the Department of External Affairs in identifying market opportunities as they arise;

(20) That the Department of Fisheries and Oceans commission an independent and thorough evaluation of its national policy on factory freezer trawlers to determine if this technology has a useful place in the industry. The Department should enunciate more clearly its policy on the use of factory freezer trawlers for underutilized species and stocks;

(21) That the federal government increase technological and financial assistance for the development of underutilized fishery resources through its regional development programs. Canadian operators already actively involved in the fishing industry, either in harvesting or processing, and those adjacent to the resource should be given priority in the development of new fisheries. Offshore companies having Enterprise Allocations with a low record of utilization over a period of time should be required to release their unused quota to other applicants wanting to utilize the resource;

(22) That federal and provincial governments increase the assistance provided to smaller companies wishing to diversify and reduce their dependency on single markets. The Department of External Affairs, in coordination with the Department of Fisheries and Oceans, should provide an ongoing and quarterly assessment of seafood export markets to assist the industry in formulating country-

specific marketing strategies. An analysis of how the Canadian industry compares with its major competitors should be incorporated;

(23) That government and industry seriously reconsider establishing the Marketing Commission and Product Marketing Councils outlined in the Report of the Task Force on Atlantic Fisheries;

(24) That the Department of External Affairs, in cooperation with other federal and provincial government departments, increase its contacts with fish processors on the East Coast. The Department should enlarge the fish component of its Program for Export Market Development;

(25) That the federal government commission a comprehensive study of the size, nature and potential of the Canadian fish and seafood market. The study should include an analysis of per capita seafood consumption in terms of edible and roundweight equivalents by species, product form and country of origin. This study should be periodically updated and made available to the Canadian fishing industry;

(26) That government encourage East Coast seafood producers to work cooperatively toward creating a more effective distribution system for the Canadian domestic market;

(27) That the federal government consider increasing the fish component of Canada's food aid programs;

(28) That government provide the financial assistance necessary to help existing small- and medium-sized fish plants to become better equipped in producing value-added products;

(29) That research and development in surimi processing be stepped up and funded jointly by government and industry. The federal government should, within the context of sound resource management, encourage the development of a surimi industry in the region based on discards from fish processing and underharvested species of fish;

(30) That the Department of Fisheries and Oceans undertake a detailed assessment of the effects of aquaculture operations on the marine environment;

(31) That the Department of Fisheries and Oceans create a senior level service headed by an Assistant Deputy Minister to coordinate all aquaculture activities. The federal and provincial governments should fully coordinate their efforts to ensure the orderly development of the sector. Both levels of government should develop a clear policy towards aquaculture based on well-defined goals, careful planning and regulation, and public and industry consultation;

(32) That the transfer to the Canadian industry of new aquaculture technology, particularly that relating to high value species, be effected as quickly as possible;

(33) That federal agencies increase their support of the industry by cost-sharing market research studies and by assisting the aquaculture sector in developing promotional and market development programs. An assessment of world farmed-salmon

production and markets should be undertaken by a federal government-industry team to establish the relative performance of the Canadian aquaculture industry in terms of its production cost and market acceptance for its products;

(34) That the Fish Inspection Program be used as a marketing tool to create awareness among domestic and international consumers that Canadian seafood has undergone the most stringent quality control system in the world;

(35) That industry and government seriously reconsider the establishment of: (a) a system of dockside grading; and (b) finished or end product grades and labels so that consumers can readily identify differences in fish quality. The Department of Fisheries and Oceans should encourage East Coast fishermen to improve fish handling techniques, such as gutting, bleeding, washing, boxing and icing, at sea.

(36) That the federal government enlist the wider support of the East Coast fishing industry in funding generic promotion of the region's fish products domestically and internationally. A means of self-assessment should be introduced to finance future generic advertising. Any federal funding should be provided on a cost-shared basis. In Canada, the federal government should enlist the funding support of private and public organizations concerned with diet and health issues. Future promotions should include educational materials for the general public, and should cover new products and species;

(37) That government support any industry attempts to mount a national trade show to introduce East Coast fish processors to retailers and food service operators from other regions of Canada. The Department of External Affairs should work toward expanding Canadian industry participation at international trade shows. A more unified Canadian presence should be sought where government funding is involved;

(38) That the Government of Canada negotiate the subsidies code and implement the dispute settlement procedures under the Canada-U.S. Free Trade Agreement in a manner consistent with Canadian expectations and with the interests of the Canadian fish plant workers and fishermen. The federal government should, in no circumstances, make Canada's sovereign right to conserve and manage its fishery resources a trade issue. This Committee is very concerned about the possible repercussions on the East Coast industry of the October 1989 ruling on West Coast salmon and herring by the Canada-U.S. Free Trade panel;

(39) That, in addition to the ongoing review of the implementation of the Canada-U.S. Free Trade Ageeement by the Standing Senate Committee on Foreign Affairs, public and private sector groups systematically and closely monitor the effects, both beneficial and adverse, of that Agreement on the Canadian industry;

(40) That the federal government make trade liberalization for *processed* fish products a major priority within the larger context of Canadian international trade policy and within the framework of the General Agreement on Tariffs and Trade. As well as multilateral negotiations, the federal government should actively work to expand trade links through bilateral negotiations to achieve widest possible market access for Canadian seafood. The Canada-U.S. Free Trade Agreement should not

be regarded as a substitute for liberalized trading arrangements with other markets such as the European Community and Japan, as pursued on both a multilateral and bilateral basis;

(41) That the federal government continue to pursue its stated policy of separating tariff issues from issues concerning allocations of fish to foreign countries;

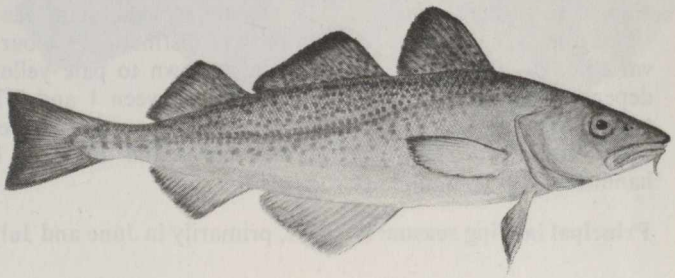
(42) That the federal government assess the market/trade impact and implications of "Europe 1992" on the Canadian fishing industry.

APPENDIX 1

SELECTED SPECIES OF FISH

ATLANTIC COD *(Gadus morhua)*

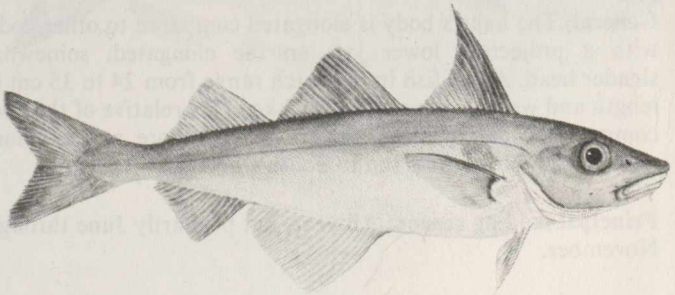
General: Codfish has been called "the king of the sea" and remains today, as it has through the centuries, the most important groundfish species in Atlantic Canada. Since the times when salt and dried cod was the backbone of the fishery in the western ocean, it continues to be the favourite seafood dish in many nations. The elongated body varies in colour from grey to green or brown to red, with a pale lateral line, whitish belly and familiar barbel on the chin. Although cod has been recorded at a maximum weight of 90 kg, the average is about 2.3 kg. Cod is caught inshore, nearshore and offshore; harvested with otter trawls, pair trawls, seines, line trawls, handlines, jiggers, traps, and gillnets as the fish move in schools from deep to shallow waters in seasonal cycles.



Principal landing season: All year, but primarily January to March, May through July, then September.

HADDOCK *(Melanogrammus aeglefinus)*

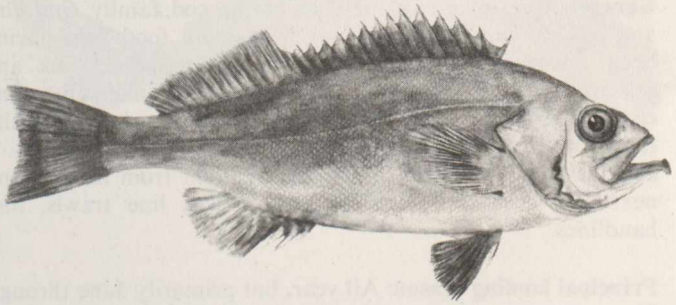
General: Long a popular species on both sides of the Atlantic, this member of the cod family ranges in North American waters from the Strait of Belle Isle to Cape Cod. It is occasionally referred to as gibber, chat, and pinger. Haddock generally resembles cod, although it is somewhat smaller, ranging from 38 to 63 cm in length and 0.9 to 1.8 kg in weight. The head and back are dark purple-grey with a black lateral line; the underside is silver-grey with a slight pink cast. it is harvested inshore, nearshore, and offshore by otter trawls, traps, baited hooks, and gillnets.



Principal landing season: All year, but primarily in March, November and December.

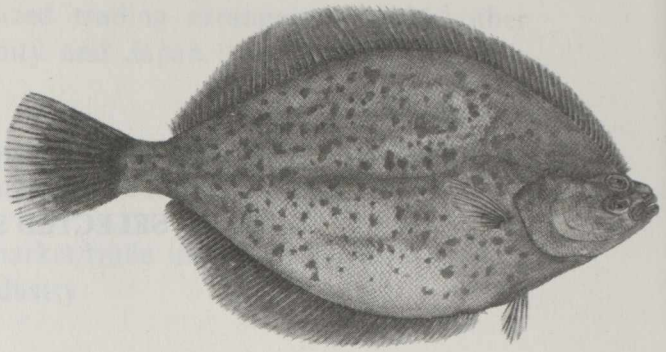
REDFISH/OCEAN PERCH *(Sebastes marinus)*

General: Sometimes called rosefish, the redfish frequents the Gulf of St. Lawrence and the cold, deep water of the Continental Shelf from southern Labrador to the Gulf of Maine. It also is called bream, Norway haddock, sea bream, berghilt, redbarsch, redperch, soldier and sébaste, as well as the trade name in Canada and the U.S. — ocean perch. A relatively small, spiny fish with black eyes and an orange to flame-red body, it is caught in the nearshore and offshore zones by bottom or mid-water trawls. It ranges in length from 20 to 41 cm with an average weight of 0.5 kg.



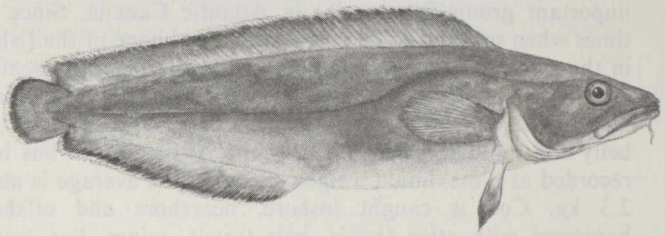
Principal landing season: April, then June through October.

YELLOWTAIL FLOUNDER *(Limanda ferruginea)*



General: Yellowtail flounder is found along the Continental Shelf from southern Labrador southward. Caught chiefly offshore in deep water by otter trawl, it is olive brown with rusty spots and, as the name implies, it has a yellow tail. Its length is up to 40 cm and its weight to 0.6 kg. The yellowtail is sometimes called rusty dab, sandy dab, or mud dab.

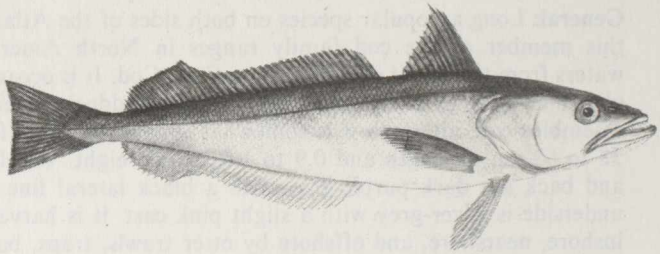
CUSK *(Brosme brosme)*



General: This relative of the cod family *Gadidae* is also known as brismak, brosmius, tusk, torsk, and moonfish, and is gaining increasing interest as a foodfish in North America. With its elongated body, it most closely resembles hake, but has a single dorsal fin as its significant mark of distinction. Colour is variable, from dark red through green-brown to pale yellow, depending on its environment. It weighs between 1 and 7 kg and grows up to 102 cm. Cusk is mainly a northern, deep-water fish, harvested inshore, nearshore, and offshore by handlines, longlines, and otter trawls.

Principal landing season: All year, primarily in June and July.

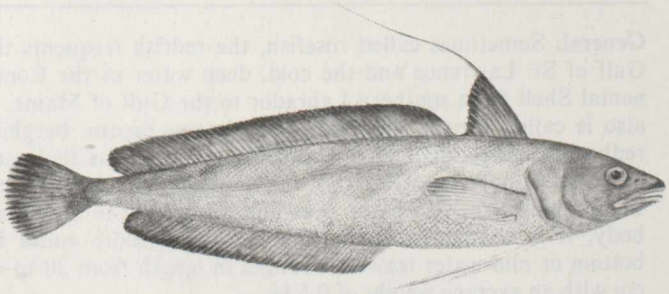
SILVER HAKE *(Merluccius bilinearis)*



General: The hake's body is elongated compared to other cods, with a projecting lower jaw on the elongated, somewhat slender head. Adult fish in the catch range from 24 to 35 cm in length and weigh an average of 0.7 kg. This relative of the cod, commonly called whiting, occurs in nearshore and offshore waters from Newfoundland to South Carolina.

Principal landing season: All year, but primarily June through November.

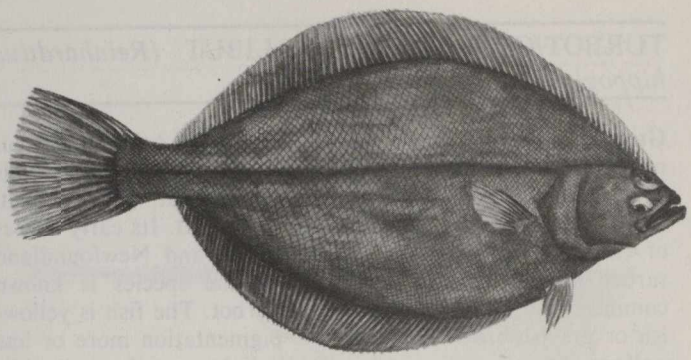
RED HAKE *(Urophycis chuss)*



General: Red hake is a member of the cod family *Gadidae*, and is becoming an increasingly important food fish, having been underutilized for years. Its slender pelvic fins and relatively few teeth distinguish it from silver hake. The many common names for this species include squirrel hake, white hake, mud hake, ling, codling, lingue and merluche. It averages between 1 and 5 kg and is caught from inshore and nearshore coastal waters by otter trawls, line trawls, and handlines.

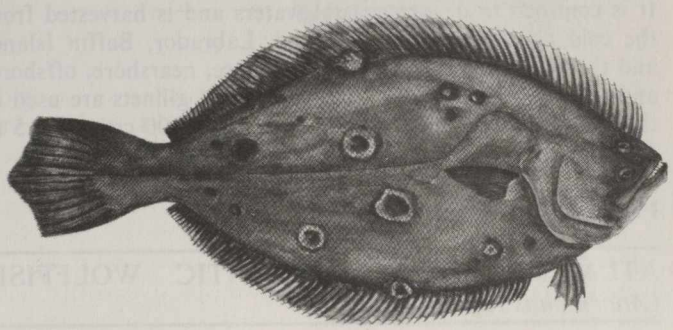
Principal landing season: All year, but primarily June through November.

AMERICAN PLAICE *(Hippoglossoides platessoides)*



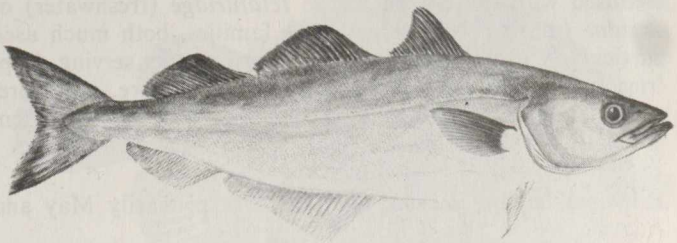
General: American plaice is the most common and commercially-important of the soles and flounders of Canada's Atlantic fishery. Sometimes called Canadian plaice, roughback, dab, sand dab, or simply plaice, it averages 38 to 40 cm in length and 0.9 to 1.4 kg in weight. This deep-water flatfish is found southward from Labrador and the Grand Banks, and is harvested primarily by offshore otter trawls, seine nets, and longlines.

SUMMER FLOUNDER *(Paralichtbhs dentatus)*



General: Often called fluke, summer flounder is the largest of the flounders. It has a compressed, oblong body, commonly brown or grey with a white underbelly, and ranges from Nova Scotia to South Carolina. It reaches a maximum length of 93 cm, and the average-sized fish weighs 6.8 kg. It is harvested largely offshore.

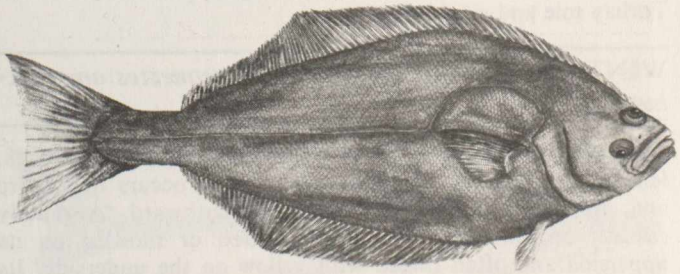
POLLOCK *(Pollachius virens)*



General: Pollock is related to cod and haddock and is perhaps best known commercially as Boston bluefish. Its many common names, however, include blisterback, saithe, coalfish, merlan, merlan noir, and colin. It differs in appearance from others in the cod family by having a pointed snout and projecting lower jaw, a more rounded body, and a forked rather than a square tail. It ranges from 50 to 90 cm in length and 1 to 7 kg in weight. An underutilized species for many years, the pollock is harvested commercially today from inshore, nearshore and offshore waters from southern Labrador to Cape Cod. It is caught by mid-water trawls, otter trawls, purse seines, longlines, and handlines.

Principal landing season: All year, but principal harvest in July and August.

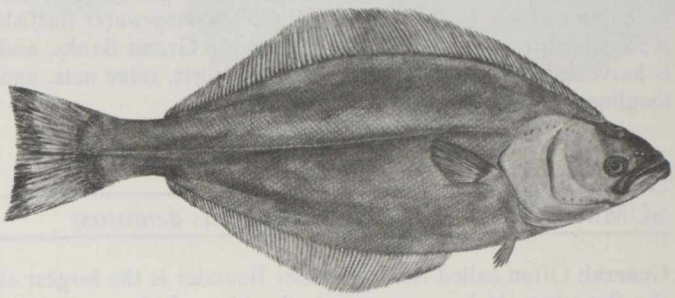
ATLANTIC HALIBUT *(Hippoglossus hippoglossus)*



General: A fish of remarkable size range, this giant member of the flatfish family has been recorded as large as 2.5 m with a weight exceeding 300 kg. Atlantic halibut commands the highest price of any of the flatfishes. Commercial weights are usually between 2.3 and 56 kg. The young fish are called chicken halibut, while the large grading is called whale halibut. The species has a wide mouth and forked tail, with an elongated flat body varying in colour from greenish-brown to dark brown on its upperside and white to grey or mottled grey-white on the bottom part. Halibut range from Labrador to the Gulf of Maine, seldom entering waters less than 60 m deep. They are caught largely in the nearshore and offshore areas with longlines and otter trawls.

Principal landing season: All year, but primarily April through June.

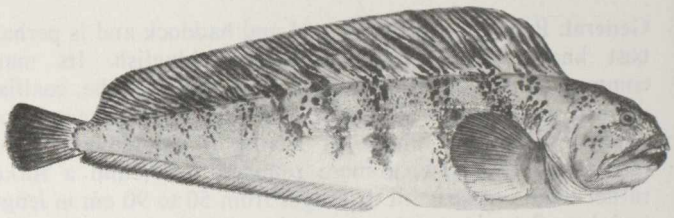
TURBOT/GREENLAND HALIBUT *(Reinhardtius hippoglossoides)*



General: This species resembles its relative Atlantic halibut more than it does the European turbot *Psetta maxima*. It is sometimes called black halibut, blue halibut, grey halibut, lesser halibut and (in the U.K.) mock halibut. Its early names of Greenland halibut, Greenland turbot, and Newfoundland turbot have also survived, although the species is known commercially in North America as turbot. The fish is yellowish or greyish-brown, with a dark pigmentation more or less uniform over the entire body, slightly lighter on the underside. It is confined to deeper coastal waters and is harvested from the cold depths around Greenland, Labrador, Baffin Island, and the Gulf of St. Lawrence by inshore, nearshore, offshore, and expeditionary vessels. Line trawls and gillnets are used in the catch. Individual fish range from 50 to 100 cm and 4.5 to 11.5 kg.

Principal landing season: May to October.

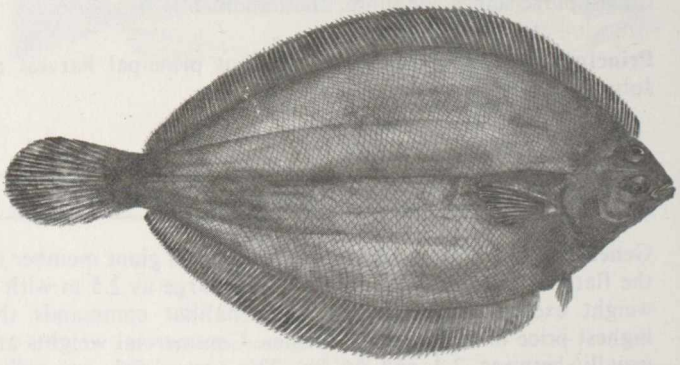
ATLANTIC CATFISH/ATLANTIC WOLFFISH *(Anarhichas lupus)*



General: The good eating qualities of the Atlantic catfish (also called ocean catfish, Atlantic wolffish, striped wolffish and ocean whitefish) are belied by its grey skin, toothy face, and generally ungraceful appearance. This species should not be confused with the catfish of the *Ictaluridge* (freshwater) or *Ariidae* (marine — "sea catfish") families, both much used particularly in the southern U.S. in restaurants serving deep-fried fish. Along the coast, it is harvested inshore, nearshore, and offshore, with individual specimens growing up to 85 cm in length and 1 to 10 kg in weight.

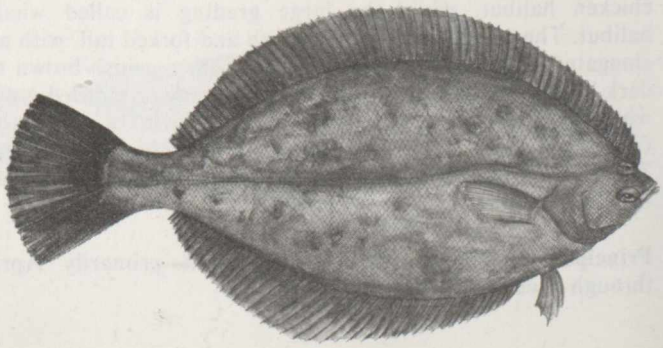
Principal landing season: All year, but primarily May and August.

WITCH FLOUNDER *(Glyptocephalus cynoglossus)*



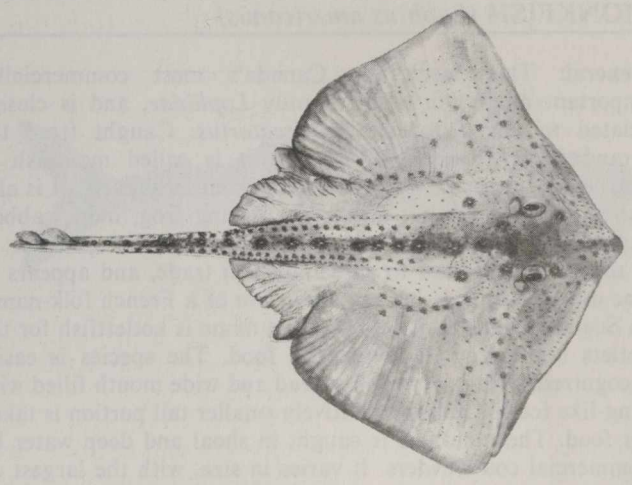
General: Commonly known as gray sole or greysole, witch flounder is greyish brown on the eyed side and greyish white on the underside. It is caught in moderately deep waters in the Gulf of St. Lawrence and off the coasts of Newfoundland, Labrador and Nova Scotia by otter trawls and seines. It averages 45 cm in length and 0.7 kg in weight. Other common names include craig fluke, pale flounder, pole dab, pade dab, Torbay sole and white sole.

WINTER FLOUNDER *(Pseudopleuronectes americanus)*



General: Winter flounder is sometimes called blackback, lemon sole and Georges Bank flounder. It occurs in inshore and offshore waters from Labrador southward. A muddy reddish brown, it is sometimes spotted or mottled on its upperside and often tinged with yellow on the underside. Its size varies with locality. In the Bay of Fundy it is about 25 cm, while on the east coast of Newfoundland, about 20 cm. The average landed weight is 1.3 kg. Inshore fishermen harvest winter flounder with handlines and drag trawls; offshore fishermen use otter trawls.

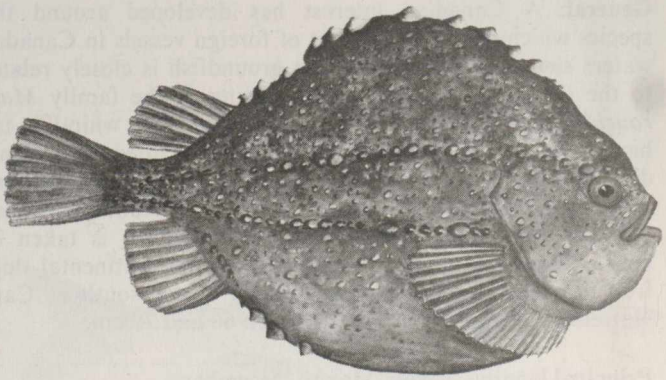
SKATE *(Raja senta)* (smooth), *(Raja radiata)* (thorny)



General: The skate, with its unusual broad "wings" and slender rat-like tail, has a number of folk names including skider, tinker, ginny, flanie, banjo, and roker. Two species are sought: the smooth skate, *R. senta*, is the smaller, reaching a maximum of 62 cm and caught from Newfoundland southward; thorny skate, *R. radiata* is the larger type (also called the starry skate and the Atlantic prickly skate) reaching almost double the size of the smooth skate and roaming the northerly waters of West Greenland, Hudson's Bay and the Atlantic provinces. Both species are taken in deep water by otter trawl.

Principal landing season: All year, but primarily May through July.

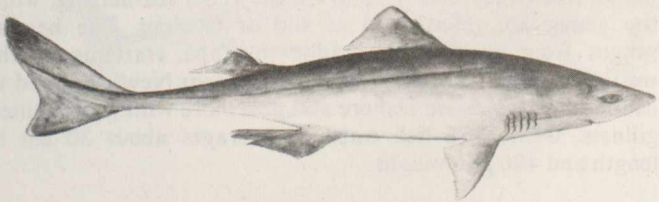
LUMPFISH *(Cyclopterus lumpus)*



General: Long a productive species in European markets where it is commonly called lumpsucker, the lumpfish is gaining increasing commercial attention in Canada for its roe, which is in demand as a caviar alternative, particularly in West Germany. The peculiar pelvic fins of the species are modified to form an adhesive disc enabling it to perch bird-like on bottom rocks, a phenomenon which gives it the folk names seasnail and snailfish. Other names include paddle-cock, sea-hen, henfish, lump, and poule de mer. A bottomfish, it invades shallow shores in late spring and early summer to spawn. It is caught largely in Newfoundland with 28 cm gillnets. A good-sized female averages 45 cm in length and produces 140,000 eggs.

Principal landing season: Early May to end of June.

SPINY DOGFISH *(Squalus acanthias)*

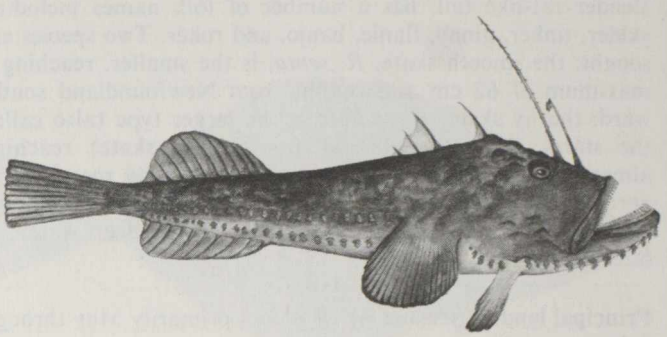


General: The spiny dogfish shark, sometimes called grayfish or spring dogfish, ranges the coast from southern Labrador southward. With sharklike features, its slender body can grow to a maximum of 123 cm and weigh up to 7 kg. Its reputation as rodfish is best known in Europe, and in the U.K. it is commonly called rock salmon. Dogfish are netted along many coastal points.

Principal landing season: June through October, primarily July through September.

MONKFISH *(Lophius americanus)*

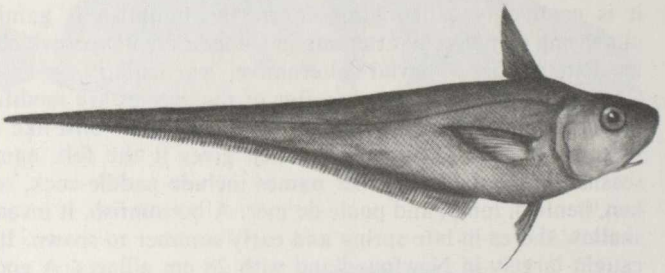
General: This species is Canada's most commercially-important anglerfish of the family *Lophidae*, and is closely related to the European *L. piscatorius*. Caught from the Grand Banks to North Carolina, it is called monkfish in northerly waters and goosefish in the southerly parts. It is also called common angler, all-mouth, fishing frog, monk, abbot, rape, sea-devil, angler, diable de mer, and poisson-pêcheur. It is sometimes referred to as bellyfish in trade, and appears in fine dining rooms as lotte, a derivative of a French folk-name. In Scandinavian countries a market name is kotlettfish for the cutlets taken from it, a favorite food. The species is easily recognized, with a large spiny head and wide mouth filled with fang-like teeth. Only the relatively smaller tail portion is taken for food. The monkfish is caught in shoal and deep water by commercial cod trawlers. It varies in size, with the largest on record being 1.2 m long, weighing 27 kg.



Principal landing season: June to September.

ROUNDNOSE GRENADIER *(Macrourus rupestris)*

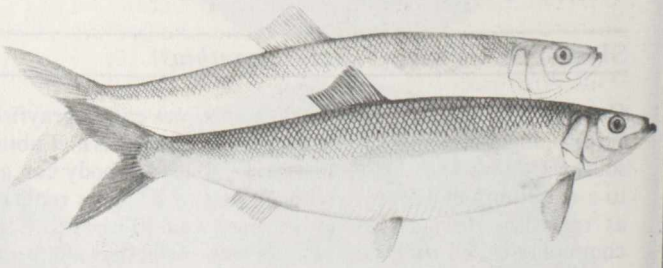
General: A Canadian interest has developed around this species which has been a target of foreign vessels in Canada's waters since the late 1960s. This groundfish is closely related to the *Gadidae*—the cod family—being of the family *Macrouridae*. Its large head and tapering body with whip-like tail have earned it the name rat-tail. It is also called rock grenadier. It is medium brown with fins of deep brown to violet, and is distinguished from other grenadiers by the blunt rather than pointed snout from which it gets its name. It is taken by bottom trawl and mid-water trawl along the continental slope from northern Labrador and is found as far south as Cape Hatteras. Its length is usually between 60 and 70 cm.



Principal landing season: May to December.

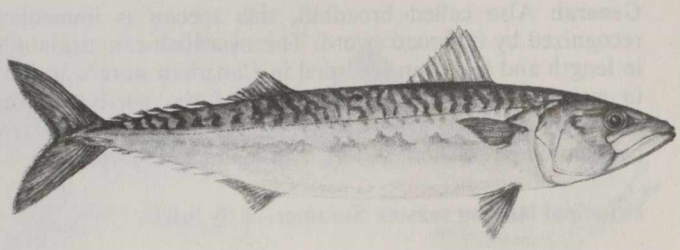
HERRING *(Clupea harengus harengus)*

General: This versatile, flavourful, highly nutritious foodfish has long been a significant commercial species, and has been salted and smoked for centuries. Its blue-green back, silver belly, and general appearance are familiar worldwide. The species is sometimes referred to by other common or regional names like Digby, mattie, and (in the U.S.) sea-herring, while the young are referred to as sild or yawling. The herring ranges from northern Labrador to Cape Hatteras in the western Atlantic, but is abundant only from Newfoundland to Maine. It is harvested inshore and nearshore with purse seines, gillnets, weirs, and fish traps. It averages about 30 cm in length and 400 g in weight.



Principal landing season: All year, principally April through September.

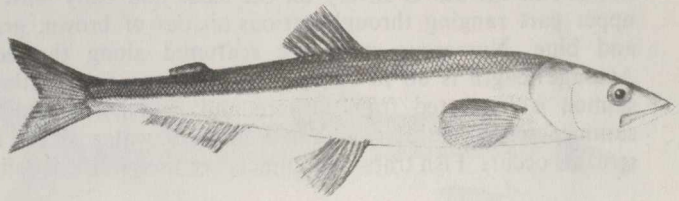
ATLANTIC MACKEREL *(Scomber scombrus)*



General: A pelagic fish, the Atlantic mackerel inhabits the open sea as do other *Scombridae* such as tuna, and is an important foodfish. It can reach a length of 55 cm and a weight of 2 kg, but is usually caught between 0.2 and 1 kg. Its steely-blue upper surface, silvery iridescent sides, and silvery-white belly makes it an attractive species. It is caught by gillnets, traps, purse seines, and jigging in inshore, nearshore and offshore waters from Newfoundland to Cape Hatteras.

Principal landing season: May through November.

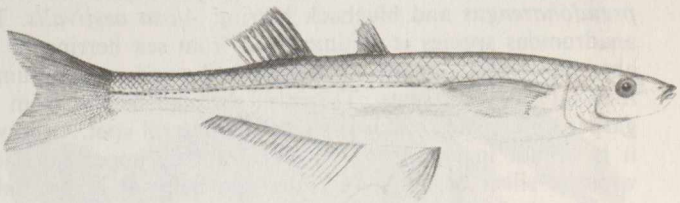
CAPELIN *(Mallotus villosus)*



General: The capelin is a fish of the high seas coming inshore to spawn on coarse sand and fine-gravel beaches from Greenland to Maine. The largest concentrations are around Newfoundland. Like its cousin the American smelt, capelin (sometimes spelled caplin) is a small fish, transparent olive to bottle-green on the upperside, with silvery sides and a white belly. It has smaller scales, however, and does not have the smelt's fang-like teeth on the tongue. Capelin can reach 23 cm in length. The species can be harvested inshore, nearshore, offshore, and by expeditionary vessels, but the frenzied inshore spawning run occurs in June and July and occasionally in late August.

Principal landing season: June and July for the inshore fishery.

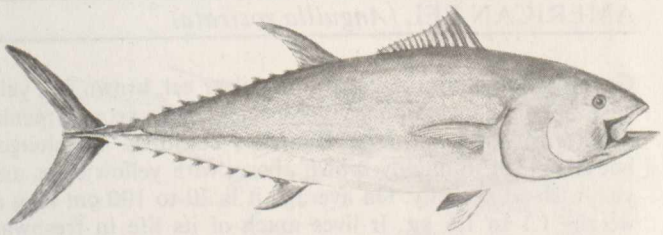
ATLANTIC SILVERSIDE *(Menidia menidia)*



General: Known as sand smelt and sometimes erroneously referred to as capelin, silverside is similar in appearance to its smelt and capelin relatives with the same transparent-green colour on the upperside, white belly and silver body band. However, it is smaller than smelt or capelin, having a maximum size of 14 cm. It is netted along shores and estuaries where it occurs in large schools.

Principal landing season: October and November.

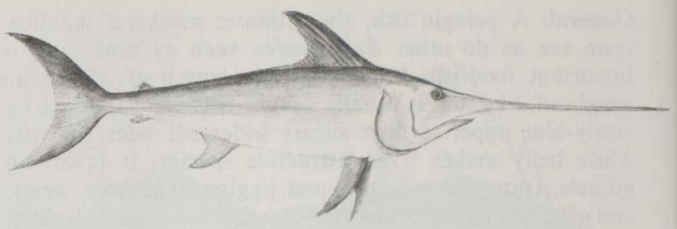
BLUEFIN TUNA *(Thunnus thynnus)*



General: The tuna species available off Canada's east coast in inshore and nearshore waters is the bluefin tuna, *Thunnus thynnus*. It is also known as tunny, horse mackerel, albacore, tuna, and bluefin. It is the largest of the tuna family, sometimes exceeding 300 cm in length and 500 kg in weight. It is widely recognized as a sportfish, but is also fished commercially for sale fresh to Japan and other markets. Other species of tuna found in offshore Atlantic waters include the albacore, *Thunnus alalunga*; Atlantic bonito, *Sarda sarda*; blackfin tuna, *Thunnus atlanticus*; bigeye tuna, *Thunnus obesus*; little tunny, *Euthynnus alletteratus*; skipjack tuna, *Euthynnus pelamis*; and yellowfin tuna, *Thunnus albacares*.

Principal landing season: August to November.

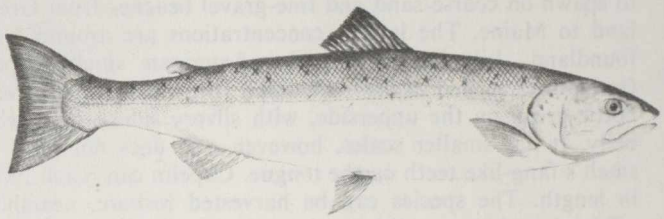
SWORDFISH *(Xiphias gladius)*



General: Also called broadbill, this species is immediately recognized by its broad sword. The swordfish can attain 4.5 m in length and has been recorded in Canadian waters at 415 kg in weight. It occurs on both sides of the north and south Atlantic oceans, a truly oceanic traveller. It is taken from nearshore and offshore waters by longline and harpoon.

Principal landing season: Summer, early fall.

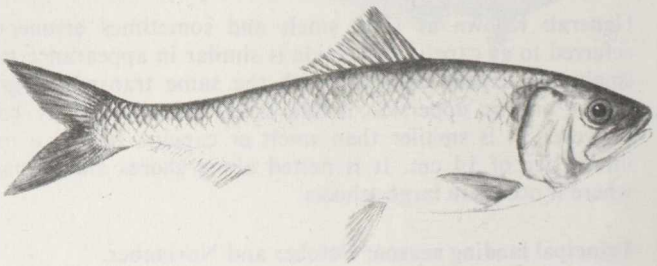
ATLANTIC SALMON *(Salmo salar)*



General: Atlantic Canada produces much of this anadromous species which is found on both sides of the north Atlantic Ocean. Recorded as the world's most ancient gourmet food, it is still sought as an unequalled gastronomic experience. Salmon in the sea is silvery on the sides and belly with the upper part ranging through various shades of brown, green, and blue. Numerous spots are scattered along the body. Average length is 80 to 85 cm and weight, 4.5 kg. Atlantic salmon is harvested from inshore and nearshore waters in summer when the spawning run to freshwater rivers and streams occurs. Fish traps and gillnets are used in the catch.

Principal landing season: May through August.

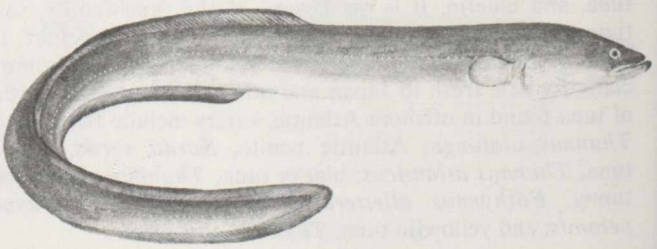
AMERICAN SHAD *(Alosa sapidissima)*



General: American shad is a member of the herring family *Clupeidae*, as are its cousins gaspereau/alewife *Alosa pseudoharengus* and blueback herring *Alosa aestivalis*. This anadromous species is distinguished from sea herring by the absence of teeth, relatively deeper body and a minimum of four lateral dark spots. This also distinguishes it from the gaspereau/alewife, which has only one lateral spot. Otherwise it is similar in appearance, with dark blue upper sides, and white to silver on the lower sides and belly. It is also called shad or alose and is harvested in rivers and estuaries by weirs, traps, and gillnets.

Principal landing season: May through June.

AMERICAN EEL *(Anguilla rostrata)*

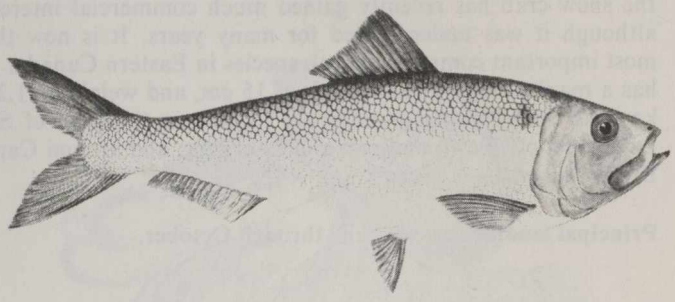


General: Sometimes referred to as silver eel, brown eel, yellow eel and anguille commune, this species ranges from Greenland southward along much of Canada's coastline. Its elongated body is black to muddy-brown above, with yellow sides and a yellowish-white belly. On average it is 70 to 100 cm long and weighs 1.1 to 1.6 kg. It lives much of its life in freshwater, returning to the sea to breed. It is caught by traps in rivers and estuaries.

Principal landing season: August through November.

ALEWIFE *(Alosa pseudoharengus)*

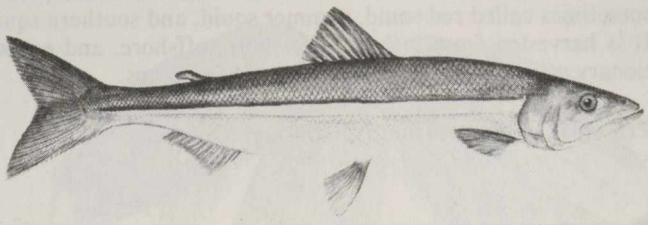
General: As the Latin name suggests, alewife is something of a pseudo herring, and is sometimes called river herring, being grouped with *(Alosa spp.)* as a shad. It is also called gaspereau, from the French name gaspareau given to the species by Canada's first settlers, the Acadians. In Acadia today (Part of Nova Scotia), the Gaspereau River, which flows through a spectacular valley of farmland, is still a good source of the gaspereau harvest. The principal catch, however, is netted from rivers and estuaries in New Brunswick. Other folk names include sawbelly, kyak, glut herring and mulhaden. Alewife is greyish-green on the upperside and has silver sides and belly. It is usually 25 to 30 cm long and weighs about 225 g.



Principal landing season: May through June.

AMERICAN SMELT *(Osmerus mordax)*

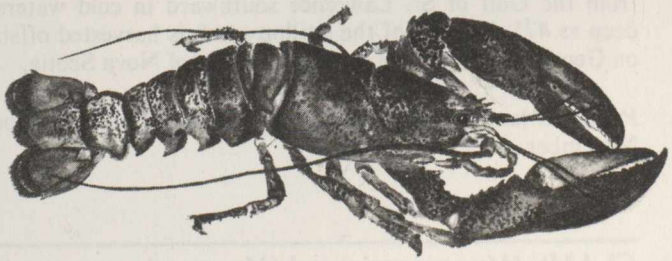
General: A small, delicate, trout-like species which, along with its capelin cousin, is gaining increasing commercial importance. Colour is transparent olive to bottle green on the back, with paler sides and a silvery belly flecked with tiny dusky dots. Smelt 2 and 3 years old, from 12 to 20 cm in length comprise the greatest part of the commercial catch. Smelt is often called sparling in the U.S. It is anadromous, occurring in coastal waters and streams from Hamilton Inlet to Virginia. It is netted chiefly inshore with boxnets, bagnets, and gillnets. The landlocked *O. mordax* is also harvested in Canada, and the ocean harvest often is referred to as "sea-smelt".



Principal landing season: October through November.

AMERICAN LOBSTER *(Homarus americanus)*

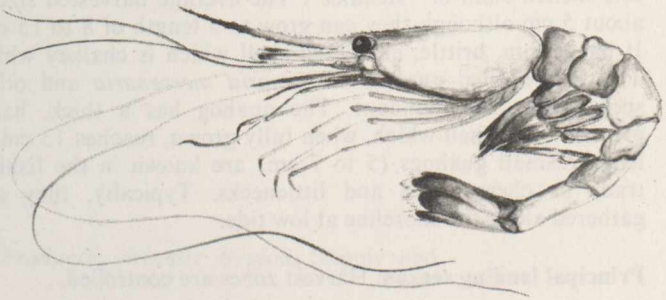
General: Sometimes called northern lobster, this species has become a familiar product worldwide. Transport by air of live lobsters, plus the advanced technology and efficiency of refrigerated container ships, have made wide distribution possible. Lobster occurs from the Strait of Belle Isle as far south as North Carolina, with the Maritime Provinces and Newfoundland providing an important part of the world's supply. Trapped from depths of 3 to 60 m, its size ranges from 0.2 to 2.3 kg. Small "canners" of under 500 g, along with the oversized "jumbos", are used in factory production.



Principal landing season: March through December.

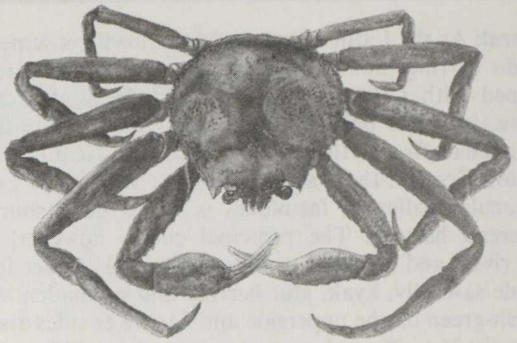
PINK SHRIMP *(Pandalus borealis)*

General: Of increasing commercial importance in recent years, this species is known as the Great Northern Prawn or Canadian Pink Shrimp and ranges from western Greenland to Maine. It is pinky-red with an average size of 7.4 to 10 cm. It is harvested in inshore, nearshore, offshore, and in expeditionary waters. Although freezer vessels are used in the harvest, pink shrimp is usually landed fresh.



Principal landing season: Spring, summer, and fall.

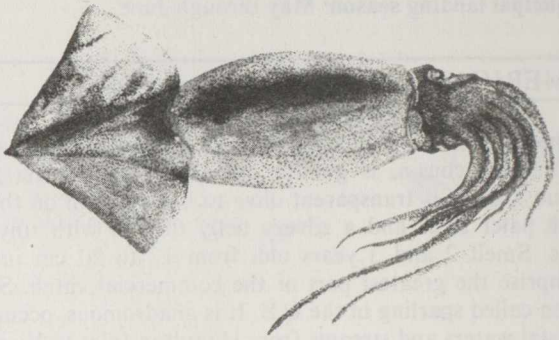
SNOW CRAB *(Chionoecetes opilio)*



General: Known variously as the spider crab and queen crab, the snow crab has recently gained much commercial interest although it was underutilized for many years. It is now the most important commercial crab species in Eastern Canada. It has a maximum carapace length of 15 cm, and weight of 1.25 kg. The main fishing grounds are located in the Gulf of St. Lawrence, off Newfoundland and Labrador, and around Cape Breton Island.

Principal landing season: June through October.

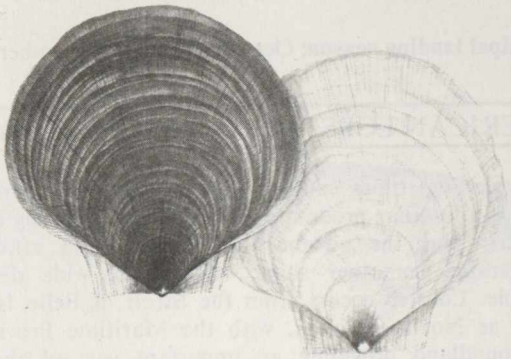
SQUID *(Illex illecebrosus)*



General: This species occurs from the shores of Newfoundland southward. A highly-specialized mollusc with 10 arms and a tubular body, its colour varies somewhat, but the background is usually white covered with reddish spots of different sizes. It grows to between 30 and 46 cm. In North America, *Illex* is sometimes called red squid, summer squid, and southern squid. It is harvested from inshore, nearshore, offshore, and expeditionary waters by otter trawls, jigs, and fish traps.

Principal landing season: July through October.

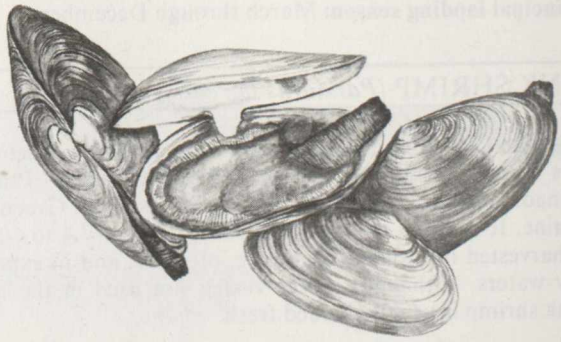
SEA SCALLOP *(Placopecten magellanicus)*



General: Of some 400 scallop species in the world's oceans, this is one of the few commercially harvested. It is also called giant scallop and smooth scallop. The hinge of the shell has distinct "ears" or "wings". Shell size can be from 13 cm to 20 cm and muscles are graded by size. The sea scallop is dredged from the Gulf of St. Lawrence southward in cold waters as deep as 475 m. Most of the scallop catch is harvested offshore on Georges Bank off the southwestern tip of Nova Scotia.

Principal landing season: All year, primarily March through November.

CLAMS *(Mya arenaria)* and *(Mercenaria mercenaria)*



General: The predominant clam harvested in the Atlantic region is *Mya arenaria*, (shown above) commonly called the soft-shelled clam or "steamer". The average harvested size is about 5 cm although they can grow to a length of 8 to 15 cm. It has a thin, brittle, elongated shell which is chalkey white. The hard-shelled quahog *Mercenaria mercenaria* and other species are less abundant. The quahog has a thick, hard, greyish-white shell which, when fully grown, reaches 13 cm in length. Small guahogs (5 to 7 cm) are known in the fishing trade as cherrystones and littlenecks. Typically, they are gathered along the shoreline at low tide.

Principal landing season: Harvest zones are controlled.

OYSTER *(Crassostrea virginica)*

General: This species is by far the most common North American oyster and, depending upon where it is harvested and landed can be called Blue Point, Malpeque, Cape Cod Chincoteague, Apalachicola, Kent Island oyster, and so on. It is also sometimes called American oyster. While all of them are *C. virginica*, they vary in shape, growth, and meat characteristics according to their habitat and food supply. The shell can be flat or deep and rounded; it can grow large or small; and, the colour of the meat can range from pearly to beige, from pale grey to green. Oysters in the commercial catch range in length from 8 to 25 cm. The Canadian Malpeque type from colder waters has achieved significant international acclaim. These oysters are harvested from natural beds in coastal inlets and estuaries, and from leased areas operated under controlled conditions. The Belon oyster *Ostrea edulis*, commonly known as the European oyster, is also grown in Nova Scotia.

Principal landing season: Fall to winter months.

BLUE MUSSEL *(Mytilus edulis)*

General: Blue mussel has played a noteworthy role in gastronomy for thousands of years. The hard shell is blue-black, brown, and sometimes brown with black rays. It is abundant throughout Canada's Atlantic region. Along the coastline it is found attached to pebbles, seaweed, and rocks; larger ones are taken along the waterline at low tide. Today the main commercial source of mussels is through aquaculture.

Principal landing season: All year except summer.

Source: Department of Fisheries and Oceans, *Canadian Fish Products: Atlantic Region*, Supply and Services Canada, 1985.

APPENDIX 2

SELECTED SPECIES OF THE ATLANTIC REGION

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Abalone	*Haliotis sp.*	ormeau	
Alewife	*Alosa pseudoharengus*	gaspareau	Gaspereau, River Herring, Sawbelly, Kyak, Glut Herring, Mulhaden
Argentine, Atlantic	*Argentina silus*	grande argentine	Great Silver Smelt, Smelt, Herring Smelt
Bass, Striped	*Morone saxatilis*	bar d'Amérique	Rockfish, Rock
Bonito	*Sarda sarda*	bonite à dos rayé	Atlantic Bonito, Pelamid, Belted Bonito, Short Finned Tunny, Horse Mackerel
Catfish, Atlantic/ Wolffish, Atlantic	*Anarhichas lupus*	loup atlantique	Ocean Catfish, Striped Wolffish, Ocean Whitefish
Capelin	*Mallotus villosus*	capelan	Caplin, lodde

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Char, Arctic	*Salvelinus alpinus*	omble chevalier	Sea Trout, Ilkalu, Ekaluk (Eqaluk), Hudson Bay Salmon, Alpine Char, Hearne's Salmon Ivitaruk (in fresh water), European Char, Arctic Salmon, Arctic Charr, Trout, Copper-mine River Salmon, Blueback Trout, Greenland Charr, Quebec Red Trout
Clam, Razor	*Ensis directus*	couteau	
Clam, Soft-shell	*Mya arenaria*	mye	Soft Clam, Clam, Steamer Clam, Hard Clam, Gaper, Long Clam, Long Neck, Mananose, Maninose, Nanny-Nose, Old Maid, Sand Clam, Sand Gaper, Squirt Clam, Strand-Gapser

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Clam, Surf	*Spisula solidissima*	mactre d'Amérique	Bar Clam, Atlantic Surf Clam
Cod, Arctic	*Boreogadus saida*	saïda	Polar Cod
Cod, Atlantic	*Gadus morhua*	morue de l'Atlantique	Cod, Codfish
Crab, Jonah	*Cancer borealis*	crabe nordique	
Crab, Rock	*Cancer irroratus*	crabe commun	
Crab, Snow	*Chionoecetes opilio*	crabe des neiges	Queen Crab, Spider Crab, Atlantic Snow Crab
Cusk	*Brosme brosme*	brosme	Brismak, Brosmius, Tusk, Torsk, Moonfish
Dogfish, Spiny	*Squalus acanthias*	aiguillat commun	Dogfish, Spring Dogfish, Grayfish, Picked Dogfish, Spiky Dogfish, Common Spiny fish, Blue Dog, Darwen Salmon,

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Dogfish, Spiny (Cont'd)	*Squalus acanthias*	aiguillat commun	Spurdog, Rock Salmon, Pacific Dogfish Harbour Halibut, Dogs, Horned Dogfish, Picked Dogfish
Dulse	*Rhodymenia palmata*	rhodyménie palmé	
Eel, American	*Anguilla rostrata*	anguille d'Amérique	Silver Eel, Brown Eel, Yellow Eel
Eel, Conger	*Conger oceanicus*	congre	Conger
Flounder, Summer	*Paralichthys dentatus*	cardeau d'été	Fluke, Gulf Flounder
Flounder, Winter	*Pseudopleuronectes americanus*	plie rouge	Blackback, Lemon Sole, Georges Bank Flounder, Sole, Flounder, Dab
Flounder, Witch	*Glyptocephalus cynoglossus*	plie grise	Witch, Gray Sole, Greysole, Craig Fluke,

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Flounder, Witch (Cont'd)	*Glyptocephalus cynoglossus*	plie grise	Pale Flounder, Pole Dab, Pole Flounder, Pade Dab, Torbay Sole, White Sole, Whitch
Flounder, Yellowtail	*Limanda ferruginea*	limande à queue jaune	Rusty Dab, Sandy Dab, Mud Dab, Yellowtail
Grenadier, Roundnose	*Macrourus rupestris* *or* *Coryphaenoides rupestris*	grenadier de roche	Rat-Tail, Rock Grenadier, Rattail
Grouper	*Epinephelus sp.*	mérou	
Haddock	*Melanogrammus aeglefinus*	aiglefin	Gibber, Chat, Pinger, Jumbo
Hake, Red	*Urophycis chuss*	merluche-écureuil	Squirrel Hake, White Hake, Mud Hake, Ling, Codling

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Hake, Silver	*Merluccius bilinearis*	merlu argenté	Whiting
Hake, White	*Urophycis tenuis*	merluche blanche	
Halibut, Atlantic	*Hippoglossus hippoglossus*	flétan de l'Atlantique	Halibut, Chicken Halibut, Whale Halibut
Herring, Atlantic	*Clupea harengus harengus*	hareng	Herring, Digby, Mattie, Sea Herring, Sardine
Irish Moss	*Chondrus crispus*	mousse d'Irlande	Carrageen, Carrageen Moss
Kelp	*Laminaria longicruris*	laminaire à long stipe	Tangle, Sea Cabbage
	Laminaria digitata	laminaire digitée	Horse Tail
	Laminaria saccharina	laminaire saccharine	
Lamprey	*Petromyzon marinus*	lamproie	Sea Lamprey
Lobster, American	*Homarus americanus*	homard d'Amérique	Lobster, Northern Lobster

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Lumpfish	*Cyclopterus lumpus*	lompe	Lumpsucker, Seasnail, Snailfish, Paddle-Cock, Sea-hen, Henfish, Lump
Mackerel, Atlantic	*Scomber scombrus*	maquereau bleu	Mackerel, Common Mackerel
Monkfish	*Lophius americanus*	baudroie d'Amérique	American Goosefish, Monk Fish, Angler, Goosefish, Common Angler, All-Mouth, Fishing Frog, Monk, Abbot, Rape, Sea-Devil, Bellyfish
Mussel, Blue	*Mytilus edulis*	moule bleue	Edible Mussel, Common Mussel
Oyster	*Crassostrea virginica*	huître	Eastern Oyster, Blue Point Oyster, American Oyster, Blue Point, Malpeque, Cape Cod Chincoteague, Apalachicola, Kent Island Oyster

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Perch, White	*Morone americana*	baret	
Periwinkle, Common	*Littorina littorea*	bigorneau	Periwinkle
Plaice, American	*Hippoglossoides platessoides*	plie du Canada	Sole, Canadian Plaice, Roughback, Dab, Sand Dab, Plaice, Long Rough Dab, Flounder, Blackback, Black back Flounder
Pollock	*Pollachius virens*	goberge	Boston Bluefish, Saithe, Blisterback, Coalfish, Black Cod, Rock Salmon, Coley, Black Pollack, Blochan, Green Cod, Scotch Hake, Sullock
Quahaug Bay	*Venus mercenaria or Mercenaria mercenaria*	palourde américaine	Hard Shell Clam, Hard Clam, Quahog, Round Clam, Cherrystone, Littleneck

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Quahog, Ocean	*Arctica islandica*	quahog nordique	Ocean Quahaug, Cyprine, Iceland Cyprine
Redfish/Ocean Perch	*Sebastes marinus* *Sebastes mentella* *Sebastes fasciatus*	sébaste	Rosefish, Bream, Norway Haddock, Sea Bream, Berghilt, Redbarsch, Redperch, Soldier
Rockweed	*Ascophyllum nodosum*	ascophylle noueuse	Knotted Wrack
Salmon, Atlantic	*Salmo salar*	saumon de l'Atlantique	Lake Atlantic Salmon, Ouananiche, Common Atlantic Salmon, Kennebec Salmon, Landlocked Salmon, Sebago Salmon, Black Salmon, Grayling (in N.S.), Grilt, Fiddler, Bratan
Sand Lance	*Ammodytes dubius* *and/or* *Ammodytes americanus*	lançon	Sand Launce, Sand Eel

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Saury, Atlantic	*Scomberesox saurus*	balaou	Needlenose, Saury Pike, Skipper, Billfish
Scallop, Iceland	*Chlamys islandicus*	pétoncle d'Islande	
Scallop, Sea	*Placopecten magellanicus*	pétoncle Géant	Giant Scallop, Giant Sea Scallop, Smooth Scallop
Shad, Allis	*Alosa alosa*	alose	Allice Shad, Rock Herring
Shad, American	*Alosa sapidissima*	alose canadienne	Alose, Common Shad, Atlantic Shad, North River Shad, Potomac Shad, Connecticut River Shad, Delaware Shad, Susquehanna Shad, White Shad
Shrimp, pink	*Pandalus borealis*	crevette rose	Northern Shrimp, Deep-water Red Shrimp, Shrimp, Deep-Water Prawn, Cold Water Shrimp, Great Northern Prawn, Canadian Pink Shrimp

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Silverside, Atlantic	*Menidia menidia*	capucette	Sand Smelt
Skate, Smooth Thorny	*Raja senta* *Raja radiata*	raie, lisse épineuse	Skider, Tinker, Ginny, Flanie, Banjo, Roker, Starry Skate, Atlantic Prickly Skate, Starry Ray
Smelt, American	*Osmerus mordax*	éperlan d'Amérique	Smelt, American Smelt, Leefish, Freshwater Smelt, Frost Fish, Rainbow Smelt, Atlantic Smelt, Sparling, Sea-Smelt
Squid, Long-finned	*Loligo pealei*	calmar à longues nageoires	
Squid, Short-finned	*Illex illecebrosus*	calmar à courtes nageoires	Boreal Squid, Red Squid, Summer Squid, Southern Squid

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Sturgeon, Atlantic	*Acipenser oxyrhynchus*	esturgeon noir	American Sturgeon
Swordfish	*Xiphias gladius*	espadon	Broadbill
Tilefish	*Lopholatilus chamaeleonticeps*	tile	
Tomcod, Atlantic	*Microgadus tomcod*	poulamon	Tomcod
Trout, Brook	*Salvelinus fontinalis*	omble de fontaine	Brook Char, Speckled Trout, Red Trout, Salmon Trout, Squaretail, Sea Trout
Trout, Brown	*Salmo trutta*	truite brune	Sea Trout, Galway Sea Trout, Orkney Sea Trout, Orange Fin, Blacktail, Finnock, Gillaroo, Peal, Sewin, Whitefish, Whitling, Herling, Truff, Scurf, Bull Trout, Migratory Trout, River Trout

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Trout, Rainbow	*Salmo gairdnerii* or *salmo irideus*	truite arc-en-ciel	Kamloops Trout, Steelhead Trout, Steelhead Salmon, Coast Rainbow Trout, Silver Trout, Finger Trout
Tuna, Bluefin	*Thunnus thynnus*	thon rouge	Tunny, Atlantic Tuna, Southern Bluefin, California Bluefin Horse Mackarel, Tuna, Bluefin, Albacore, Great Albacore Black Fish
Turbot/Greenland Halibut	*Reinhardtius hippoglossoides*	flétan/turbot du Groenland	Black Halibut, Blue Halibut, Lesser Halibut, Mock Halibut, Greenland Turbot, Newfoundland Turbot, Grey Halibut
Urchin, Sea	*Strongylocentrotus droebachiensis*	oursin vert	Urchin, Green Sea Urchin, Sea Egg

ENGLISH COMMERCIAL NAME	LATIN NAME	FRENCH COMMERCIAL NAME	OTHER ENGLISH NAMES
Urchin, Red sea	*Strongylocentrotus franciscanus*	oursin rouge géant	
Whelk	*Buccinidae*	buccin	
Whitefish, Lake	*Coregonus clupeaformis*	corégone	Common Whitefish, Sault Whitefish, Whitefish, Eastern Whitefish, Great Lakes Whitefish, Humpback Whitefish, Inland Whitefish, Gizzard Fish
Whiting	*Merlangus merlangus*	merlan	Marling
Wolffish, spotted	*Anarhichas minor*	loup tacheté	Spotted Sea Cat, Spotted Catfish

Sources: (Compiled by Alan Richardson) American Fisheries Society, *A List of Common and Scientific Names of Fishes from the United States and Canada*, 4th ed., special publication No. 12, Bethesda, Maryland, 1980; Nova Scotia Department of Fisheries, *Nova Scotia Directory of Fish Products*, June 1987; Bureau de nomalisation du Québec, Conseil des denrées alimentaires du Québec, *Guide, Produits de la pêche, Identification des principales espèces présentant un potentiel commercial au Québec*; Department of Fisheries and Oceans, Marketing Directorate, Promotions Branch, *Canadian Fish Products: Atlantic Region*, Supply and Services Canada, 1985; Organisation for Economic Co-Operation and Development, *Multilingual Dictionary of Fish and Fish Products*, 2nd ed., Fishing News Books Limited, Farnham, England, 1978; Department of Fisheries and Oceans, Communications Directorate, *Underwater World* factsheet series, Supply and Services Canada; Department of Fisheries and Oceans, D.J. Scarratt, editor, *Canadian Atlantic Offshore Fishery Atlas*, Canadian Special Publication of Fisheries and Aquatic Sciences 47 (revised), Supply and Services Canada, 1982.

APPENDIX 3

GLOSSARY OF TERMS

Allocation – The process of dividing the quota among the various fishing interests such as the Canadian fleet and the foreign fleets.

Anadromous Fish – Any fish which migrate from the sea into fresh-water rivers for the purpose of spawning. Fish which migrate in the reverse direction for spawning are known as catadromous.

Aquaculture – Culture or husbandry of finfish, shellfish and aquatic plants.

Biomass – The total weight of a fish stock.

Bleeding and Gutting – One of the sequence of events in the proper on-board handling of groundfish. While the fish is still alive, it is bled (by severing the main artery) to reduce the chance of blood spots and bruising. It is then dressed by slitting its belly and removing the stomach and other organs so as to retard the process of decomposition. The fish is then washed and put on ice, preferably in boxes.

Block – A 16-pound frozen slab of fish fillets or pieces of fillets packed into metal pans and frozen. Blocks are later cut into fish sticks or other shaped portions, battered, cooked and refrozen for retail or food service sales.

Boxing – The use of boxes on-board a fishing boat to hold fish in ice.

Catch Rate – The catch per unit of effort. This is a measure of fishing success.

Continental Shelf – The underwater shelf of land that slopes from the exposed edge of a continent for a variable distance to the point where the steeper descent (continental slope) to the ocean floor begins.

Cured Fishery Products – A preservation method that can involve any combination of smoking, salting, drying, fermenting or acid curing. Mild-cured fish means low salt content.

Dressed Fish – Fish that has been gutted and had the organs removed.

Ecosystem – A system made up of a community of animals, plants and bacteria and its interrelated physical and chemical environment.

Edible Weight – The edible weight of individual products as consumed.

Enterprise Allocation (EA) – A specified amount of a particular species of fish which a fishing enterprise may harvest during a given period of time.

F0.1 Level – The level of fishing mortality at which the increase in yield (marginal yield) by adding one more unit of fishing effort is 10% of the increase in yield by adding the same unit of effort in a lightly exploited stock.

Factory Freezer Trawler (FFT) – A fishing vessel that harvests, processes and freezes all of its catches on board. It may also be referred to as a floating fish plant.

Fillets – Strips of flesh from the sides of fish, cut away from the bone frame.

Finfish – Fish with fins; not shellfish.

Fish Habitats – Spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly to carry out their life processes.

Fishery – This term refers to the industry of catching, processing and marketing fish, but it may also be used to define a fishing ground or the legal jurisdiction to catch fish in specified waters.

Freezer Trawler – A fishing vessel that can freeze the catch on board. The fish are typically headed and gutted, then frozen in large blocks, to be thawed and filleted later.

Fresh Fish – Fish that has not been subjected to preservation.

Frozen Fish – Fish which, if in the form of a 25 millimetre-thick block of unpackaged fillets, has been frozen to a centre temperature of no more than –21°.

Gillnet – A long rectangular net, usually anchored near the ocean bottom, which catches fish by entanglement or snaring at the gills. If such nets are not tended frequently, fish die in them and fish quality deteriorates.

Glut – A period during which large quantities of fish are caught and fish plants are unable to handle all fish presented for processing.

Groundfish – The collective term used to describe species that feed near the ocean bottom.

Growth Rate (of a stock) – The weight a fish stock acquires in the course of a year.

Habitat Conservation – The management of human activities to prevent the destruction of fish habitats.

Hail Report – A daily report made to DFO by vessels, specifying its estimated catch, by species.

Inshore Fleet – All mobile and fixed gear (longline, traps, gillnets, weirs and handlines) less than 100 ft. LOA.

Inshore/Offshore Split – The relative percentage shares between the inshore and offshore fleets of the Canadian portion of the TAC for a particular stock.

Interception – The capture of fish in a fishery directed to another stock or species. The term is mostly used in connection with salmon which are fished during their shoreward migration. The "by-catch" is the result of such interception.

Landed Value – Prices paid for the first sale of the fish or shellfish as landed by fishermen.

Length Overall (LOA) – The horizontal distance measured between the perpendiculars erected at the extreme ends of the outside of the main hull of a vessel.

Longline – A line of baited hooks, anchored to the ocean bottom and retrieved at intervals by a vessel called a longliner.

Marketing – A group of related business activities whose purpose is to satisfy consumer demands for goods and services. Involved are product design, development, distribution, advertising, promotion and publicity, as well as market analysis. In simple terms, marketing is the total process of moving goods and services from the producer to the end-user.

Maximum Sustainable Yield (MSY) – The largest annual harvest in weight that can be taken from a fish stock while maintaining the size of that stock.

NAFO Areas – The waters off Canada's East Coast were divided by the International Commission on the North Atlantic Fisheries (ICNAF) into a set of zones defined by an alpha-numeric code. Following the extension of fisheries jurisdiction, ICNAF was replaced by NAFO, the Northwest Atlantic Fisheries Organization.

Natural Mortality – The rate at which fish die of natural causes, from disease, old age, parasites or predation. "Fishing mortality" is the rate of death as a result of fishing.

Non-Surplus Stocks – These are stocks deemed necessary to Canada's needs and which can be harvested with existing Canadian harvesting capacity; however, to meet international or bilateral commitments, a fixed amount of these may be allocated to a foreign nation(s).

Northern Cod – The popular term for the population of cod found from the northern half of the Grand Bank to the Hamilton Inlet Bank off Labrador (NAFO areas 2J, 3KL). It is the largest fish stock off Canada's East Coast and is also considered the largest cod population in the world.

Offal – Waste material (guts, blood, head, tail, bones, skin) resulting from dressing and processing of fish.

Offshore Fleet – All mobile and fixed gear (longline) vessels over 100 ft. LOA.

Omega-3 – Fatty acid found in seafood believed to have a therapeutic effect on the human cardiovascular system.

Over-the-Side – Sales of fish from a fishing vessel direct to a processing vessel.

Pelagic Species – Fish that swim near the surface, often in large schools.

Per Capita Consumption – The amount consumed per person in a given population.

Pot – A baited chamber which fish can easily enter but from which they are unable to escape.

Purse Seine – A commercial fishing net that is particularly suitable for capturing schools of fish such as herring and mackerel. When placed in position, it stands like a fence in the water around a school of fish. It is supported at the surface by floats of metal, cork or glass, and held down by weights along the bottom. A pursing rope is strung through large metal rings along the bottom of the net. When the rope is tightened, the bottom is drawn, to form a huge purse. The vessel pursuing this method of fish capture is called a seiner.

Quota – The regulated portion of a TAC.

Recruitment – The number of young fish which enter the commercial fishery for the first time in a given year.

Roe – Fish eggs, usually still enclosed in the ovarian membrane. For commercial purposes, roe must be obtained at a specified range of maturity.

Round Weight – This term is generally used in the industry to refer to the weight of fish as purchased from a vessel. Fisheries statistics use the term "round weight" to refer to the live weight of fish.

Saltfish – Fish cured by use of salt; depending on moisture content, it may be classified as 'wet' or 'dry.'

Shellfish – Any aquatic invertebrate animal with a shell, such as a mollusc or crustacean. The term may also include echinoderms.

Species – A discrete group of plants or animals that transmit specific characteristics from parent to offspring.

Stock – A population of fish of one species that congregates and/or migrates within a given geographical area. There may be several stocks of fish within each species. As in the case of salmon, the fish in each stock are genetically distinct, even though they belong to the same species.

Surimi – A semi-processed fish protein. There are two types of surimi: frozen surimi, a frozen block of washed minced fish meat to which sugar and other ingredients have been added, and fresh surimi, consisting of wet fish protein only.

Surplus Stocks – These are stocks (or species) within the 200-mile zone determined to be surplus to the Canadian fishing fleets' needs.

Tonne (Metric Ton) – One thousand kilograms (2,204 lbs.). A standard unit of measurement in fisheries statistics.

Total Allowable Catch (TAC) – For each distinct stock of fish, an annual determination of a total catch level is made by biologists according to management criteria to

ensure the size and stability of the fish population and to rebuild the stock if it has been depleted.

Trap – Any of a variety of devices that lead fish into empoundment. The cod trap is the main traditional gear on Newfoundland's East Coast.

Trawling – A method of commercial fishing in which a boat drags a large conical net or trawl along the sea bottom. The net is closed at the small end and held open mechanically at the mouth or large end. Trawls may be floated and dragged at various depths between the surface and bottom.

Two-Hundred Mile Limit – The area of ocean over which Canada has exclusive rights to manage and control fisheries and related matters.

Value of Production – Value of fishery products after processing. In most cases, this is "free-on-board" (f.o.b.) plant value.

Wet Fish Trawler – An offshore fishing vessel that preserves its catch by storage on ice.

Year Class – Fish born to a given stock during a given year.

Yield – The percentage of edible meat recoverable from a fish or shellfish.

APPENDIX 4

ABBREVIATIONS

ABTAC	Atlantic Bluefin Tuna Advisory Committee
ACFM	Atlantic Council of Fisheries Ministers
ACOA	Atlantic Canada Opportunities Agency
AGAC	Atlantic Groundfish Advisory Committee
ARC	Atlantic Regional Council
ASAB	Atlantic Salmon Advisory Board
CAFSAC	Canadian Atlantic Fisheries Scientific Advisory Committee
CIDA	Canadian International Development Agency
COGLA	Canada Oil and Gas Lands Administration
CSAC	Canadian Seafood Advisory Council
DEA	Department of External Affairs
DFO	Department of Fisheries and Oceans
EA	Enterprise Allocation
EC	European Community (also known as the European Economic Community or EEC)
EEZ	Exclusive Economic Zone
ERDA	Economic and Regional Development Agreement
FADA	Fish Aid Development Agency
FCC	Fisheries Council of Canada
FFMC	Freshwater Fish Marketing Corporation
FFT	Factory Freezer Trawler
FORAC	Fisheries and Oceans Research Advisory Council
FPAFC	Federal-Provincial Atlantic Fisheries Committee
FTA	Canada-U.S. Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GSAC	Gulf Shrimp Advisory Committee
GSPAC	Gulf Small Pelagics Advisory Committee
ICCAT	International Convention for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
ICNAF	International Commission for the Northwest Atlantic Fisheries
INPFC	International North Pacific Fisheries Commission
IOG	Independent Offshore Group
LOA	Length Overall
MSY	Maximum Sustainable Yield
NAFO	Northwest Atlantic Fisheries Organization
NASA	North Atlantic Seafood Association
NASCO	North Atlantic Salmon Conservation Organization
NSAC	Northern Shrimp Advisory Committee
OECD	Organisation for Economic Co-operation and Development
OSAC	Offshore Scallop Advisory Committee
OVOWG	Offshore Vessels Owners' Working Group
PEMD	Program for Export Market Development
RSPP	Resource-Short Plant Program
TAC	Total Allowable Catch
TGNIF	Task Group on the Newfoundland Inshore Fisheries
UNCLOS	United Nations Convention on the Law of the Sea

APPENDIX 5

STANDING SENATE COMMITTEE ON FISHERIES
LIST OF WITNESSES
Second Session — Thirty-third Parliament

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
20	June 16, 1987 Ottawa, Ont.	**Department of Fisheries and Oceans** Miss Nancy Dale Assistant Director Market Analysis Policy and Program Planning Mr. Daniel G. Caron Chief Economics Services, Quebec Region Mr. Hugh Trudeau Area Manager Southern New Brunswick Scotia-Fundy Region Mr. Jim B. Jones Director Program Coordination & Economics Gulf Region Mr. Martin Foubert Senior Market Analyst Market Analysis, Economic and Commercial Analysis Directorate Mr. Bertin Leblanc Senior Analyst Marketing and International Policy, Gulf Region.
21	December 1, 1987 Ottawa, Ont.	**IGA — Convent Glen** Mr. Gilles Faubert Manager Fish Department

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
22	December 8, 1987 Ottawa, Ont.	**Department of Fisheries and Oceans** Mr. Karl Laubstein Director Resource Allocation Branch
24:6-8	February 2, 1988 Sept-Îles, Quebec	**City of Sept-Îles** Mr. Aylmer Whithom Municipal Councillor
24:8-9		**Chamber of Commerce of Sept-Iles** Mr. Allan Parvu President
24:11-25, 69-71		***Alipêche Inc.*** Mr. André Fortier President
24:26-37		**Department of Fisheries and Oceans** Mr. Roger Gélinas Chief Laboratories and Technical Services, Inspection Branch, Quebec Region.
24:38-42		***Association des gestionnaires de la rivière Moisie Inc.*** Mrs. Pauline Poirier President
24:42-49		**Atlantic Salmon Federation** Mr. Charles Langlois Director
24:50-62, 77-78		**Primonor Inc.** Mr. Gerald Organ Manager
24:50-62, 77-78		Mr. Paul Nadeau Liaison Officer
24:62-69, 71		***Syndicat des métallos (Sept-Iles)*** Mr. Jean-Claude De Grasse Representative

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
24:72-77, 81-82		***Regroupement des associations des pêcheurs de la Haute et Moyenne Côte Nord***
		Mr. Clovis Poirier President
24:72-77, 81-82		Mrs. Sylvie Anctil Liaison Officer
24:78-81		**Department of Fisheries and Oceans**
		Mr. Daniel Caron Chief Economic Services, Quebec Region
24:83-85		**Squidly's**
		Mr. Barry Blanchette Owner
25:7-8	February 3, 1988 Mont-Joli, Que.	**Town of Mont-Joli**
		Mr. Marcel Lafrance Pro-Mayor
25:11-31		***Les Frères Hubert Inc.***
		Mr. Georges Hubert President
25:11-31		Mr. Paul E. Hubert Lobster fisherman
25:11-31		***Pêcheries Hubert Inc.***
		Mr. Marcel Hubert President
25:11-31		***Multi-Pêches Inc.***
		Mr. Isaac Hubert Director General
25:32-46		***Société de Pêche Nova Nord Ltée***
		Mr. Bernard Blais Chairman
25:32-46		Mr. Robert Huard Director
25:46-56		***Association des Pêcheurs de Les Méchins Inc.***
		Mr. Alain Dugas President
25:46-56		Mr. Roy L'Italien Secretary

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
25:56-63		***Association des mytiliculteurs madelinots***
		Mr. Mario Cyr President
25:63-75		***Société de développement économique du St. Laurent***
		Mr. Marc Gagnon Chairman
25:63-75		Mr. Maurice Gauthier Chairman of the Fisheries Committee
25:63-75		Mr. Raymond Dufour
25:63-75		Mr. Benoît Bouffard
25:75-85		***Centre d'interprétation du saumon atlantique***
		Mr. René Trépanier Director
25:75-85		Mr. François Lévesque Financial Director
25:85-98		**Department of Fisheries and Oceans**
		M. Jean-Jacques Maguire Chief Research Division, Quebec Region
25:85-98		Mr. Allain Fréchette Biologist
25:98-109	February 3, 1988 Mont-Joli, Que.	***Société des Pêches de Newport Inc.***
		Mr. Robert Huard Chairman
25:109-110		***Association des pêcheurs de la région de Rimouski***
		Mr. Robert Parent Member
25:110-128, 149-150		**Department of Fisheries and Oceans**
		Dr. Jean Boulva Director Institut Maurice Lamontagne

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
25:129-142		***Centre de recherche en ressources maritimes de l'Est du Québec*** Mr. Armand Lachance Director
25:142-148		***Groupe d'étude des ressources maritimes — Université du Québec à Rimouski*** Mr. Daniel Martin Research Officer
25:142-148		Mrs. Josée Lavoie Research Officer
26:9-23	February 5, 1988 Quebec, Que.	***Association québécoise de l'industrie de la pêche*** Mr. Jones R. Sheehan Chief Executive Officer
26:23-32		**Department of Fisheries and Oceans** Mr. Denis Martin Director General Quebec Region
26:23-32		Mr. Serge Labonté Chief Resource Allocation Division Quebec Region
26:33-45		***Association québécoise de commercialisation de poissons et fruits de mer*** Mr. Jean Gagné Vice-President Director General Dellixo-St-Laurent/Waldman
26:45-55		***Exportation Gaspé Cured Inc.*** Mr. Marc Bunton Director General
26:55-69		**Individual presentations** Mr. Marcel Daneau Professor Economics Department Laval University

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
26:69-75		Mrs. Rebecca Lent Professor Rural Economics Department Laval University
26:75		**Department of Fisheries and Oceans** Mr. Daniel Caron Chief Economic Services Quebec Region
26:76-83		***Fédération Québécoise pour le Saumon Atlantique*** Mr. Jean Racine President
26:83-92		**Quebec Wildlife Federation** Mr. Yves Jean Vice-President
26:92-95		**Individual presentation** Mr. Hubert Sohet
27	February 9, 1988 Ottawa, Ont.	**Individual presentation** Mr. Archie L.W. Tuomi Recreational Fisheries Economist and consultant
28	March 1, 1988 Ottawa, Ont.	**Eastern Fishermen's Federation** Mr. Allan Billard President
29	March 15, 1988 Ottawa, Ont.	**Fisheries Council of Canada** Mr. Ron Bulmer President
30:5-28	April 19, 1988 Ottawa, Ont.	The Hon. Thomas E. Siddon, P.C., M.P. Minister of Fisheries and Oceans
30:5-28		**Department of Fisheries and Oceans** Mr. R.W. (Ron) Crowley Director General Economic and Commercial Analysis Directorate

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
31	April 26, 1988 Ottawa, Ont.	**Department of Fisheries and Oceans** Mr. Louis Tousignant Senior Assistant Deputy Minister Corporate and Regulatory Management Mr. David Tobin Director General Atlantic Fisheries Operations Mr. Peter Flewwelling Acting Director Regulations and Enforcement Mr. Jim Beckett Chairman Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC)
32:5-9	May 3, 1988 Ottawa, Ont.	**Department of Fisheries and Oceans** Mr. Paul MacNeil Director General Strategic Policy and Planning Directorate Mr. Larry Doucette Assistant Director Commercial & Market Analysis Division
32:21		Dr. Ian Pritchard Director Aquaculture and Resource Development Branch
32:9-15		Mr. Yves Tournois Acting Director Atlantic Fisheries Development Branch Mr. David Rideout Acting Director Field Operations Inspection Services Directorate

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
32:20-23		Dr. Jean Worms Scientist Gulf Region
32:15-19, 22-23		**Connors Brothers Limited** Mr. Chris Frantsi Manager Aquaculture Division
33:6	May 9, 1988 Charlottetown P.E.I.	**City of Charlottetown** His Worship Mr. John E. Ready Mayor of Charlottetown
33:7		**Chamber of Commerce** Mr. Bill Simmons Vice-President
33:9-26, 28, 33		Honourable Johnny Ross Young, M.L.A. Minister of Fisheries for Prince Edward Island
33:26-27		Mr. H. Douglas Johnson Deputy Minister of the Department of Fisheries of the Province of Prince Edward Island
33:33-47		**Abegweit Seafoods Inc.** Mr. Garth Jenkins President
33:47-55		**P.E.I. Environmental Advisory Council** Mr. Daryl Guignion Member
33:55-65		**P.E.I. Shellfish Association** Mr. Bill Warren President
33:65-80		**P.E.I. Fishermen's Association** Mr. Cliff Thomson Managing Director
33:80-92		**University of Prince Edward Island** Dr. Jerry R. Johnson Atlantic Veterinary College

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
33:92-99		**P.E.I. Cultured Mussel Growers' Association** Mr. George Vessey President
33:99-108		**Prince County Fishermen's Association** Mr. Keith Paugh Vice-President
33:108-116		**P.E.I. Flyfishers Federation** Mr. Wayne Gairns President
33:108-116		Mr. Al Ledgerwood Director
33:116-125		**The Maritime Fishermen's Union** Mr. Bernie Conway Managing Director
33:126-133		Mr. Roddy Pratt, M.L.A. for Second Kings, P.E.I.
34:7	May 11, 1988 Yarmouth, N.S.	**City of Yarmouth** Her Worship Mrs. Marjorie McEachen Mayoress of Yarmouth
34:8		**Chamber of Commerce** Mrs. Linda Deveau Second Vice-President
34:8-27		**Nova Scotia Draggers Fishermen's Association** Mr. S. Clifford Hood, C.R., President
34:27-38		**Université Sainte-Anne** Dr. Roseann Runte President
34:27-38		Dr. Julius Comeau Chairman of the Board
34:27-38		Mr. Léger Comeau Deputy Rector for External Affairs
34:27-38		Mr. Charles Gaudet Director of the School of Adult Vocation Training

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
34:38-52		**Seafood Unlimited** Mr. Wade Nickerson Wholesale Distributor
34:52-59		**Lunenburg Foundry & Engineering Ltd.** Mr. Peter J. Kinley, P.Eng. Vice-President of Research and Development
34:59-62		**Comeau Sea Foods Ltd.** Mr. Marcel R. Comeau President
34:62-83		Honourable John G. Leefe Minister of Fisheries for Nova Scotia
34:62-83		**Department of Fisheries, Province of Nova Scotia** Ms. Janice Raymond Director of Marketing
34:62-83		Mr. Neil LeBlanc, M.L.A. for Argyle, Nova Scotia
34:83-89		**Individual presentation** Mr. Clayton d'Entrement
34:89-90		**F.W. Bryce** Mr. C. Robert Del Torchio Marketing Manager
34:91-103		**Canadian Institute of Fisheries Technology** Dr. Thomas A. Gill
34:103-109		**Atlantic Herring Co-Operative Ltd.** Mr. L.G. Stewart Manager
34:110-119		**IMA Aquatic Farming Ltd.** Mr. Brian Ives President
34:120-131		**Crowell Eel Processor Limited** Ms. Dianne Crowell

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
35:5-5	May 12, 1988 Halifax, N.S.	**Board of Trade** Mr. Kenneth A. Mader Senior Vice-President
35:6-17		**SGS Supervision Services** Mr. Ross Piercey Manager
35:18-30		**Seafood Producers Association of Nova Scotia** Mr. Roger Stirling President
35:18-30		Mr. Eric Roe Vice-President
35:30-38		**Baader Canada Ltd.** Mr. Austin Kerr Vice-President and General Manager
35:30-38		Mr. Wayne F. van Norden Sales Representative
35:38-53		**The Nova Scotia Clam Company** Mr. David O'Brien President
35:53-61		**Cansov Marine Products Ltd.** Mr. Allan Farmer President
35:61-74		**National Sea Products Ltd.** Mr. John P. MacNeil Executive Vice-President (North American Retail)
36:6-7	May 13, 1988 Sydney, N.S.	**Town of Sydney** Mr. Fabian Smith Alderman
36:7-17		**Highland Fisheries Co. Ltd.** Mr. Stephen Greene Assistant to the President of Clearwater Fine Foods
36:7-17		Mr. Bob Cooper Comptroller of Highland Fisheries Co. Ltd.

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
36:7-17		Mr. Ed Grant General Manager of Cape Breton Operations
36:7-17		Mr. Greg Mitchelitis Manager of Highland Fisheries in Glace Bay
36:17-29		**Cape Breton Fisheries Advisory Committee** Ms. Eileen MacNeil Executive Director
36:30-38		**Individual presentation** Mr. John Kehoe Fisherman
36:38-49		**Stuart Salmon Farm Ltd.** Mr. Robin Stuart Fish Farmer
36:49-63		**Nova Scotia Wildlife Federation** Mr. C. Perry Munro Representative
36:63-75		**Retail — Wholesale and Department Store Union** Mr. Bernard Campbell Business Agent
36:75-82		**Canadian Seafood & Allied Workers' Union** Mr. Robert Hawley President
36:83-100		**Cheticamp Fishermen's Co-Operative Ltd.** Mr. Yvon Deveau Director
37	May 13, 1988 Sydney, N.S.	**Red Lobster Canada** Mr. Bill Dover President Ms. Barbara Worden Manager of Menu Planning Ms. Jane Nicholson Manager of Corporate Communications

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
38:7-10	May 21, 1988 Goose Bay, Lab.	**City of Goose Bay** His Worship Henry Shouse Mayor of Happy Valley-Goose Bay
38:10-22		**Individual presentation** Mr. Danny H. Dumaresque
38:22-36		**Labrador Inuit Association** Mr. Toby Andersen
38:36-44		**Eagle River Development Association** Miss Marion Pardy
38:45-57		**Individual presentation** Mr. Laurence Jackson Freelance Writer/Consultant
38:58-62		**Individual presentation** Ms. Susan Felsberg
38:62-74		**Torngat Fish Producer's Co-operative** Mr. William Flowers
38:74-89		**J.W. Hiscock & Sons Ltd.** Mr. Bart Higgins Manager
38:89-101		**Naskapi Montagnais Innu Association** Mr. Bart Jack
39:7-9	May 24, 1988 St. John's, Nfld.	**City of St. John's** His Worship John Murphy Mayor of St.John's
39:10-26		**The Fish Aid Development Agency** Mr. Brendan T. Foley President
39:26-41		**Fisheries Association of Newfoundland and Labrador Limited** Mr. Bruce W. Chapman President
39:26-41		Mr. A.A. Etchegary Executive Vice-President International Marketing

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
39:26-41		Mr. D. Lenic Executive Assistant International Marketing
39:41-49		Mr. Peter Fenwick, M.H.A. Leader of the NDP Newfoundland
39:49-65		**Morgan International Marketing Co. Ltd.** Mr. C.J. (Jim) Morgan, President
39:65-75		**Lower Trinity South Development** Mr. Fred Grant President
39:75-87		**Memorial University** Dr. Michael Voigt Department of Biochemistry
39:87-96		**Inshore Fishermen's Improvement Committee** Mr. Owen Meyers
39:96-105		**Coastal People Resource Protection Group** Mr. Michael Kehoe Chairman
39:105-126		**Institute of Fisheries & Marine Technology** Dr. Chris Campbell Vice-President Fisheries Division
39:126-136		Mr. Richard Whitaker President Newfoundland Salmonid Association
39:126-136		Mr. Eugene Hiscock, M.H.A. Eagle River District
39:136-150		**Newfoundland & Labrador Wildlife Federation** Mr. Richard Bouzan President

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
39:150-159		**Placentia Area Fishermen's Committee** Mr. Pius Murphy Chairman
39:159-169		**Individual presentation** Mr. Patrick Layman Fisherman
39:169-178		**Atlantic Ocean Farms Ltd.** David Walsh President
39:178-183		**Contrawl Limited** Mr. Thomas T. Rose Secretary Treasurer
40:5-6	May 25, 1988 Gander, Nfld.	**Town of Gander** Ms. Sandra Kelly Deputy Mayor of Gander
40:6-24		**Three Island Development Association** Mr. Winston Jennings Co-ordinator
40:25-52		**Individual presentation** Mr. Wilfred Bartlett Fisherman
40:52-66		Mr. George Baker, M.P. (Gander-Twillingate)
40:67-89		**Town of Gander Development Committee** Mr. Fraser Lush Chairman-Councillor
40:67-89		Mr. Carl Tessier Councillor
40:67-89		Mr. Patrick Kane Councillor
40:67-89		Mr. Lew Holloway Town Manager
40:89-113		**Port au Port East Development Association/Newfoundland and Labrador Rural Development Council** Mr. Gerald Smith President

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
40:89-113		Mr. Tony Collins Executive Director
41:6-7, 22-23	May 26, 1988 St. Anthony, Nfld.	**Town of St. Anthony** His Worship Raymond Squires Mayor of St. Anthony
41:8-22		The Honourable William Rompkey, P.C., M.P.
41:23-35		**Individual presentation** Mr. Wade Lavers Fisherman
41:35-44		**Individual presentation** Mr. Robert "Jock" Gardiner Fisherman
41:45-58		**White's Fisheries Ltd.** Mrs. Julie White
41:58-63		**Individual presentation** Mr. Baxter Rose Fisherman
41:63-74		**Fishermen's Association of St. Lewis** Mr. Roy Mangrove President
41:74-80		**Nameless Cove Fishermen's Committee** Mr. Clyde Roberts Chairman
41:80-84		**Newfoundland/Labrador Rural Economic Development Council** Mr. Boyd Nole, Northern Director.
41:84-91		**Individual presentation** Mr. Raymond Elliott, Fisherman.
42:6-7	May 28, 1988 Stephenville, Nfld.	**Town of Stephenville** His Worship Kevin Walsh Mayor of Stephenville
42:8-18		**Government of Newfoundland** Ms. Cheryl Stagg Development Officer Department of Development and Tourism

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
	42:19-30	**Bayside Seafood** Mr. Edward English President
	42:30-53	**Superior Seafood Ltd.** Mr. Ron Callahan President
	42:53-63	**Parson Pond Seafoods** Mr. Fraser Keough President
	42:53-63	Mr. George Payne General Manager
	42:63-82	Mr. Walter Carter, M.H.A. (Twillingate)
	42:63-82	Mr. Kevin Alyward, M.H.A. (Stephenville)
	42:82-91	**Individual presentations** Mr. Lester Green Fisherman
	42:91-95, 100-101, 106-108	Mr. Frank Maddigan
	42:95-100, 104-106, 107-109	Mr. Jim Cochrane
	42:109-119	**Port-au-Port Development Association** Mr. Allan Alexander President
	42:119-131	**UFCW Fishermen's Union 1252** Mr. Dave Johnson Special Representative
	42:119-131	Mr. Kevin Hardy Secretary-Treasurer
	42:132-139	**Individual presentations** Mr. Danny Duffy Fisherman
	42:139-142	Mr. Myron Gallant Secondary Fish Processor

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
43	May 31, 1988 Ottawa, Ont.	**Department of External Affairs** Richard Ablett Director Fisheries and Fish Products Division **Embassy of the Union of Soviet Socialist Republics** Alexei P. Makarov Minister-Counsellor Vladimir G. Fedorenko Representative of the USSR in Canada on Fisheries
44	June 14, 1988 Ottawa, Ont.	**Department of Fisheries and Oceans** Mr. Martin Foubert, Acting Chief Shellfish and Groundfish Market Analysis Group Economic and Commercial Analysis Directorate Mr. Brian Donahue, Market Analyst Groundfish Market Analysis Group Mr. Pierre Comeau Atlantic Seals Co-Ordinator
45:6-16	June 16, 1988 Caraquet, N.B.	***Produits Blan-Din Co. Ltée*** Mr. François Blanchard
45:17-30		**Belle Baie Products Ltd.** Mr. Valmond Chiasson
45:30-34		**School of Fisheries, N.B.** Mr. Hedard Albert
45:35-49		**Department of Fisheries and Oceans,** **Gulf Region** Mr. Alphonse Cormier Assistant Director Fisheries and Habitat Management
45:35-49		Mr. Normand Dugas Manager, Eastern Region, N.B.

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
45:49-53		***Association des Pêcheurs d'huîtres de la baie de Caraquet, Inc.*** Mr. Jean Godin, President
45:53-56		His Worship Mr. Germain Blanchard Mayor of Caraquet
45:56-74		**Chamber of Commerce** Mr. Fernand Gionet President
45:56-74		Mr. Martin S. Légère Secretary
45:56-74		Mr. Valmond Chiasson Member
45:56-74		Mr. Roméo Michon Member
45:74-88		**From Ellis Seafoods** Mr. Victor Gionet
45:88-97		**Individual presentation** Mr. Serge Dugas, Oyster Grower
45:97-102		***Pêcheurs sportifs de thon*** Mr. Victor Lanteigne
46:6-33	June 17, 1988 Caraquet, N.B.	***Association des pêcheurs professionels acadiens*** Mr. Jacques Haché Président
46:6-33		Mr. Gastien Godin
46:6-33		Mr. Mario Hébert
46:6-33		Mr. Renald Guinard
46:33-38		**University of Moncton in Shippagan** Mr. Jean-Guy Rioux Director
46:33-38		Mr. Allain Bourgoin Professor, Fish Sciences

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
46:38-53		**Department of Fisheries and Aquaculture, Province of New Brunswick** The Honourable Douglas Young Minister of Fisheries and Aquaculture in New Brunswick.
46-53-65		**Department of Intergovernmental Affairs, Province of New Brunswick** The Honourable Aldéa Landry, President of the Executive Council, Minister of Intergovernmental Affairs.
46:66-84		***Association Coopérative des Pêcheurs de l'Île Limitée*** Mr. Rhéal Chiasson General Manager
46:66-84		Mr. Paul-Orel Chiasson Director of Communication Supplies and Services
47:8-10	June 20, 1988 St. Andrews, N.B.	**City of St. Andrews** Mr. Beverly Lawrence Mayor of St. Andrews
47:10-23		**Fundy Weir Fishermen Association** Mr. Walter Kozak General Manager
47:24-36		**Atlantic Salmon Federation** Mr. J.M. Anderson Vice-President of Operations
47:36-56		**Connors Brothers Ltd.** Mr. Ken Hirtle Senior Vice-President
47:36-56		Assisting Mr. Hirtle: Mr. Bill Moffett Vice-President, Administration
47:56-61		**Technical University of Nova Scotia** Dr. Robert Ackman Professor

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
		Individual presentation
47:61-72		Mr. William Lee Mockbee Consultant
47:73-87		**Star Kist Foods Canada, Ltd** Mr. Ian Glen Vice-President of Marketing
47:73-87		Assisting Mr. Glen: Mr. Gerald Clay President
47:88-108		**St. Andrews Biological Station** Dr. Robert Cook Director
47:88-108		Assisting Dr. Cook: Dr. Alan Campbell Dr. J.S. Scott Dr. V. Zitko
47:108-116		**Pendleton Fisheries** Mr. Keith Pendleton
48:6-7	June 23, 1988 Shediac, N.B.	**Town of Shediac** Mr. Armand Bannister Clerk and Town Manager
48:7-15		**Union of New Brunswick Indians** Mr. Graydon Nicholas President
48:15-26		***Cabinet G.T.A. Consultants en pêches*** Mr. Gilles Thériault President
48:27-38		**Maritimes Fishermen's Union** Mr. Michael Belliveau Secretary Treasurer
48:27-38		Mr. Réginald Comeau Regional Representative
48:39-46		**Westmorland Fisheries Ltd.** Mr. Yvon Gaudet Vice-President
48:46-54		**Executive Council of the Lobster Advisory Committee** Mr. Normand Maillet

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
48:55-65		**Leslie Léger and Sons Ltd.** Mr. Leslie Léger President
48:65-71		**Canadian Wildlife Service** Mr. Tony Erskine Chief of Migratory Bird Conservation
48:72-77		**New Brunswick Wildlife Federation** Mr. Fred Wheaton Chairman of the Fisheries Committee
48:77-88		**Cormier and LeBlanc, 1968 Ltd.** Mr. Napoléon LeBlanc Co-owner
49	August 16, 1988 Ottawa, Ont.	**Department of External Affairs** Mr. Peter Walker Director General of the Western Europe Bureau Ms. Jennifer Barbarie Western Europe Trade and Investment Development Division **Department of Fisheries and Oceans** Donna M. Petrachenko A/Director Program Planning & Coordination Atlantic Fisheries Mr. Karl Laubstein Director, Resource Allocation Branch Mrs. Elizabeth Snider Chief, Northern Fisheries Operations Dr. G.B. Ayles Regional Director Biological Sciences Branch

ISSUE No.	DATE	ORGANIZATIONS AND WITNESSES
		Ms. Mimi Breton Senior Officer Marine Mammals and Northern Quebec Resource Allocation
	September 6, 1988 Ottawa, Ont.	**Seaku Fisheries Inc.** Mr. Neil Greig
		FAROCAN Inc. Mr. Henry Copestake President
50	September 14, 1988 Ottawa, Ont.	**National Sea Products Limited** Mr. Gordon Cummings President
		Mr. Robbie Shaw Senior Vice President
	Second Session — Thirty-Fourth Parliament	
1	September 26, 1989 Ottawa, Ont.	**Atlantic Canada Opportunities Agency** Gordon Slade Vice President
2	October 3, 1989 Ottawa, Ont.	**Fisheries Council of Canada** Ron Bulmer President
3	October 4, 1989 Ottawa, Ont.	**Department of Fisheries and Oceans** Bryson Guptill Director Commercial Market Analysis Division