Annual Report 1992-1993

Fisheries and Oceans | Pêches et Océans

Canada

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Annual Report of the Department of Fisheries and Oceans for the year ending March 31, 1993

1992-1993

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Fisheries and Oceans | Pêches et Océans
Deputy Minister | Sous-ministre

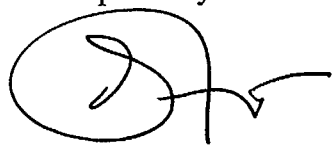
September 12, 1994

The Honourable Brian Tobin
Minister of Fisheries and Oceans
Ottawa, Ontario

Dear Mr. Minister,

I have the honour to submit the Annual Report of the Department of Fisheries and Oceans for the fiscal year ended March 31, 1993.

Respectfully submitted,



William A. Rowat

Ottawa, Canada
K1A 0E6

Canada

Minister of
Fisheries and Oceans

CANADA

Ministre des
Pêches et des Océans

September 14, 1994

To His Excellency the Right Honourable
Ramon Hnatyshyn, P.C., C.C., C.M.M., C.D., Q.C.

May it please Your Excellency,

I have the honour herewith, for the information of Your Excellency and the Parliament of Canada, to present the Annual Report of the Department of Fisheries and Oceans for the fiscal year ended March 31, 1993.

Respectfully submitted,

Brian Tobin

Ottawa, Canada K1A 0E6

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INTRODUCTION

Important events occurred in 1992/93 which significantly altered Canada's fishing industry, particularly on the east coast, and the way in which the Department of Fisheries and Oceans delivers its services.

On the Atlantic coast, major steps were taken to protect the declining groundfish stocks and to help the fishing industry participants through the difficult times. Following the collapse of the northern cod stock, a two-year Canadian fishing moratorium was declared in July 1992 and the Northern Cod Adjustment and Recovery Program was established to help those most affected. The 1993 Atlantic Groundfish Management Plan concentrated on protecting stocks, adjusting the industry and forging government/industry partnerships. Under it, two new bodies — the Fisheries Resource Conservation Council (FRCC) and the Panel on the Use of Foreign Vessels — were created to give the private sector greater voice in running their industry. Meanwhile, the Task Force on Incomes and Adjustment continued its job of studying the future of the Atlantic fishing industry.

Nationally, work proceeded to pave the way for two new independent boards, one on each coast, to grant licences, allocate resources and apply enforcement sanctions. The boards would represent a significant change in the relationship between the Department of Fisheries and Oceans and the fishing industry.

The Department began implementation of the seven-year, $140 million Aboriginal Fisheries Strategy aimed at increasing participation of Aboriginal groups in management of fisheries traditionally used by them. As well, the long-term job of streamlining and consolidating fisheries regulations was completed.

An important event in the international arena was the United Nations Conference on Environment and Development. The Conference was held in Brazil where delegates followed Canada's lead in calling for a United Nations conference on high-seas fisheries to establish international rules for managing and conserving highly-migratory and straddling stocks. Closer to home, an international court decided largely in Canada's favour in its dispute with France over waters south of Newfoundland and St. Pierre and Miquelon. Canada's work to reduce foreign overfishing outside the Atlantic 200-mile zone saw positive results when the European Community and some non-NAFO countries agreed to help conserve these stocks.

The Science Sector continued research on the biology and populations of most major stocks of Canada's marine, anadromous and Arctic freshwater fisheries species, and continued to provide advice on the status of these stocks. Research also continued on aquaculture, fish habitat and the effects of ocean conditions on living marine resources. The Science Sector pursued national and international studies on marine and freshwater pollution, and on the relationship between oceans and atmosphere, particularly with regard to climate change. The Canadian Hydrographic Service continued to survey and chart waters, publish information and develop and transfer technology.

Highlights on the Department's policy side included publication of the first-ever study on the aquaculture supply industry, cooperative agreements with the Atlantic provinces, and on the corporate side, progress on harbour projects and authorities.

INTRODUCTION

The Inspection Import System (INIM) became fully operational in June 1992. The Quality Management Program (QMP) was implemented by all federally registered plants. A system to track QMP inspections and the status of industry compliance was implemented. DFO enforcement provided effective monitoring and control of foreign fishing vessels operating in Canadian waters and monitoring of those fishing in the NAFO Regulatory Area.

MANDATE, OBJECTIVE AND ORGANIZATION OF THE DEPARTMENT OF FISHERIES AND OCEANS

Canada is a coastal state with vital sovereign interests in three bordering oceans. Canada has the world's longest coastline and second largest continental shelf. Its 200-mile Exclusive Fishing Zone, declared in 1977, represents 27 per cent of Canada's territory. Many major cities are coastal ports or are located on the St. Lawrence Seaway, the world's longest and most heavily used waterway. One-quarter of Canada's Gross National Product (GNP) is based on foreign trade, more than half of which is transported by water. Weather and climate, which are driven by ocean processes, determine the location and success of our important fishing, agriculture and forestry industries. Canada's fishing industry is a major exporter of fisheries products and the mainstay of hundreds of small communities in coastal areas. Canada is richly endowed with fresh water resources: 7.5 per cent of the country's surface area is covered by freshwater, representing 16 per cent of the world's total surface area of freshwater.

The clients of the Department are well defined and include:

The Canadian public, which expects its fisheries resource and fish habitat to be managed responsibly and conserved for present and future generations. It also expects wholesome fish products, safe harbours, reliable navigational charts and a scientific capacity to deal with environmental and resource issues of local, regional, national and international concern;

The fish harvesting and processing sectors, including 89,500 commercial fishermen; Native people fishing for food, societal, and ceremonial purposes; 1,500 aquaculturists; 1,100 importers; 38,000 plant workers; and more than 6 million recreational fishermen. They expect a fair and equitable share of the fishery resource and involvement in regulations governing their activities;

The ocean manufacturing and services industries, with approximately 500 firms and 8,100 employees making major contributions to strategic sectors of the ocean economy, such as offshore petroleum development. They expect leadership from the government in the development of Canada's oceans economy.

Mandate

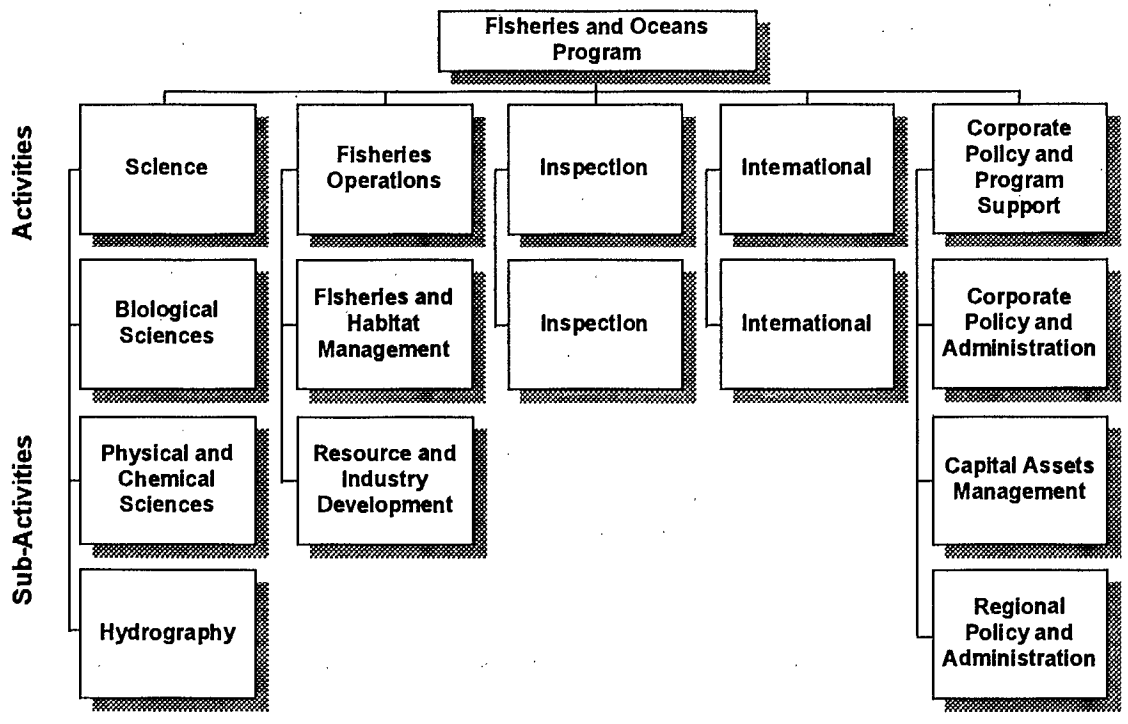
While other government departments contribute to the management of Canada's water-based activities, Fisheries and Oceans is the only federal department with resource-management responsibilities with a primary focus on water and the resources it contains. Fisheries and Oceans has responsibility for all matters respecting oceans not by law assigned to any other department.

Parliament's jurisdiction over sea-coast and inland fisheries, public harbours and navigation in marine and inland waters is established by the *Constitution Act*. The direction of this responsibility and the extent to which it is exercised by the federal government have been determined by judicial interpretation, agreements with provinces and the evolution of public policy. Some provinces have been delegated varying degrees of administrative responsibilities.

Objective

The objective of the Department of Fisheries and Oceans (DFO) is to undertake policies and programs in support of Canada's economic, ecological and scientific interests in the oceans and inland waters; 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; and to coordinate the policies and programs of the Government of Canada respecting oceans.

Organization by Activity



The departmental activity structure groups operations into the following activities: Science, Fisheries Operations and Inspection. To ensure that these activities are managed as a national program with clear and effective linkages to government priorities, they are directed by the Assistant Deputy Minister (ADM) Science, ADM Fisheries Operations, and the ADM Regulatory and International Affairs, respectively.

Corporate and regulatory management functions are the responsibility of the Senior Assistant Deputy Minister who also oversees capital assets management. The Department also has an Assistant Deputy Minister for Policy and Program Planning which includes economic and commercial analysis and Communications.

The program is delivered in six departmental regions, each headed by a Regional Director General and each with its own headquarters. They are: Newfoundland Region headquartered in St. John's,

Newfoundland; Scotia-Fundy Region headquartered in Halifax, Nova Scotia; Gulf Region in Moncton, New Brunswick; Quebec Region, Quebec City; Central and Arctic Region in Winnipeg, Manitoba; and, Pacific Region in Vancouver, British Columbia.

SCIENCE

Objective

To ensure that scientific information of high international standard is available to the Government of Canada for use in developing policies, regulations and legislation regarding the oceans and aquatic life, and to ensure that information is available to other government departments, private industry and the public for use in planning and carrying out aquatic activities.

To provide and communicate a reliable scientific basis for the management of fisheries and fish habitat and for aquaculture; to acquire and communicate scientific information on the impact of deleterious substances on fish, fish habitat and aquatic ecosystems; to describe and understand the climate and processes of the ocean, their influence on fish stocks, and their interaction with the atmosphere; to describe and quantify marine environmental parameters relevant to marine engineering, transportation and other activities; to chart Canadian waters for the purpose of safe navigation, to facilitate fishing activities and to assist coastal and offshore development; to develop and refine methodology and technology necessary to carry out the Department's scientific role and to transfer relevant technology to Canadian industry to develop the capabilities of the private sector; and to facilitate and coordinate the Government's marine science programs in collaboration with interested departments through the Interdepartmental Committee on Oceans (ICO).

Description

The Science Activity is organized into three sub-activities: Biological Sciences, Physical and Chemical Sciences, and Hydrography.

Biological Sciences

This sub-activity is responsible for conducting stock assessments and related research on all major fisheries resource species in order to provide the scientific basis for managing the fisheries resource for its sustained utilization. Research is also conducted on the dynamics of marine and freshwater ecosystems. In addition, this sub-activity is responsible for research and experimental development in order to provide the necessary scientific advice and services for aquaculture in Canada; for augmenting the production of wild stocks of fish, aquatic invertebrates and marine plants; and for curbing the introduction and spread of communicable fish diseases. In the area of fish habitat, the sub-activity is responsible for the development of scientific advice and services needed for managing the habitat of fish, aquatic invertebrates, marine mammals and marine plants.

Physical and Chemical Sciences

This sub-activity is responsible for the Department's physical oceanographic research program and related data-management, offshore development, ocean climate prediction, marine services, coastal engineering, defence and shipping. Research grants and ship support to universities are also included under this heading. The chemical sciences component of this sub-activity includes research and monitoring relating to the distribution, pathways and fate of chemicals in marine and freshwater ecosystems, the controlling processes, and the effects of toxicity of chemicals to aquatic organisms and ecosystems. Its purpose is to anticipate and respond to chemical crises and to provide advice to the Department's fish habitat managers and other regulatory agencies.

Hydrography

The Canadian Hydrographic Service (CHS) is responsible for conducting field surveys and gathering relevant data on tides, water levels and currents, and for compiling and publishing accurate charts and publications for safe navigation through Canadian and adjacent international of navigational waters. In addition, the CHS participates with Energy, Mines and Resources Canada in geophysical mapping and prepares the resulting geophysical maps for those engaged in offshore development and for maritime boundary negotiations. Technology is developed in order to increase the accuracy and efficiency of data collection and chart production. Developments in technology are subsequently transferred to the private sector, where feasible.

FISHERIES OPERATIONS

Objective

To conserve, protect, develop and enhance the fishery resource base and its habitat; to provide for the management, allocation and control of the commercial, Aboriginal and recreational fisheries in marine and inland waters; to maintain and develop benefits from the use of the resource; and to provide services and infrastructure in support thereof.

Description

The Department has integrated the former Pacific and Freshwater Fisheries and Atlantic Fisheries Sectors into one Fisheries Operations Sector to streamline program delivery and management strategies under nationally consistent standards.

The Fisheries Operations Activity encompasses all federal fisheries and habitat management and fisheries development functions in all provinces and territories in Canada, both within and adjacent to Canada's 200-mile fishing zones. This includes marine waters and river systems and lakes in all areas, except where authority for the management of inland fisheries has been delegated to a provincial or territorial government; shared management of the Canadian portion of transboundary rivers; and interception fisheries in international waters. The management of the Fisheries Operations activity is achieved through two sub-activities: Fisheries and Habitat Management, and Resource and Industry Development.

Fisheries and Habitat Management

Resource assessment and allocation activities involve the protection of sufficient biomass to ensure self-generation of stocks and the fair distribution of harvestable surpluses among user groups to ensure an orderly and equitable harvest. Collection and analysis of harvest data and stock assessments permit in-season management and the development of fishing plans for future years;

Licensing is the means for regulatory participation in, and access to, the fishery to ensure that the harvest remains within conservation limits. Activities include issuing licences for fishermen and vessel registrations; processing licence transfers and appeals; and developing licensing and policy guidelines;

Surveillance and enforcement programs ensure compliance with Canadian fisheries and habitat legislation and policies. Enforcement mechanisms include fisheries quotas, gear restrictions, season closures, licensing conditions and terms and conditions of habitat authorizations.

Fish habitat management includes operational, regulatory, consultative and advisory activities consistent with achieving the Department's Habitat Policy objective of a net gain of the productive capacity of fish habitat. This involves liaison and coordination with other federal departments, provincial governments, government agencies, and the private sector; and,

Regulations development provides for the development, amendment and processing of regulations necessary for carrying out fisheries management, including impact evaluations of legislation and regulations and production of annual regulatory plans.

It is important to note that full-cycle consultations with fishermen, processors, recreational anglers, Aboriginal representatives and provincial fisheries officials form an integral part of fisheries management and the effective delivery of service in all areas.

Resource and Industry Development

Programs carried out under this sub-activity contribute to the stability and viability of fishing and fishing-related industries. Activities are aimed at more cost-efficient exploitation of the fisheries resource; productivity and quality-related improvements to fish harvesting and processing practices; new product development; introduction of more selective harvesting technology and value-added processing technology; and resource development.

Areas of focus for departmental resource and industry development activities include:

Resource Development activities include development of new fisheries, exploitation of underutilized species and aquaculture activities in the Atlantic, Pacific and northern regions. These are encouraged through federally funded assistance administered by Fisheries and Oceans for exploratory fishing to determine the potential for commercial harvesting activity and the development or transfer of appropriate harvesting, aquaculture and processing technology. Along with promoting aquaculture activity and

improving enterprise viability, agreements are made with the provinces to streamline the licensing process for these sectors and coordinate federal-provincial efforts.

In partnership with industry/user groups, provincial governments and other federal departments and agencies, the Department undertakes initiatives to identify and develop fisheries resources with the potential to generate benefits for local economies. Chief among these are initiatives related to recreational fisheries, underutilized species and aquaculture.

Resource enhancement activities involve rehabilitation of wild stocks on both coasts through hatchery development, habitat restoration and improvements.

Industry Development activities are directed to fisheries diversification, improved economic viability and realization of fisheries opportunities. The financial performance of the industry is monitored and economic and commercial analysis is provided. Work is undertaken with other federal departments, agencies, provinces and industry to identify priority development initiatives for departmental implementation.

Fishery development agreements are made with the provinces for joint funding in the areas of recreational fisheries. Aboriginal fisheries, resource enhancement, underutilized species and aquaculture product development, productivity and quality improvements, and technology development and transfer are other activities included in this area of focus.

Under Industry Development a wide range of development assistance is provided through the Atlantic Fisheries Adjustment Program. The program is aimed at adjusting the Atlantic industry to the current realities of depressed stocks, lower incomes and reduced employment opportunities. Development assistance is geared to diversifying the fisheries: the development of underutilized species and aquaculture, new product development, technology improvements, conversion to fishing gear better suited to the Department's conservation and habitat goals, and fishermen's professionalization.

Technology Development activities include developing and transferring technology that improves industry productivity and performance. The focus is on development of cost-efficient and environmentally sound fishing vessels, selective harvesting techniques, new fish products and new processing technology.

Research and development is undertaken and initiatives are proposed to fishermen to enhance operational performance. These initiatives are geared to achieving optimal vessel and operational designs that maximize fuel efficiency, resource sustainability and protection of the environment. Technical and economic advice is provided for fishermen on the design, construction and operation of selective fishing gear and processing systems.

Technology-transfer packages consisting of video productions with supporting materials, workshops and presentations are designed to transfer expert systems and other technology to fishermen across Canada.

INSPECTION SERVICES

Objective

To provide reasonable assurance that fish and fish products for domestic and export trade meet Canadian or foreign country grade, handling, identity, process, quality and safety standards.

Description

Inspection Services is responsible for the development and implementation of national policies, regulations and procedures to ensure that Canadian-produced fish and fish products meet appropriate grade, handling, identity, process, quality and safety standards, and that imported fish and fish products meet minimum standards of identity, quality and safety.

Authority for these responsibilities is derived from the *Fish Inspection Act* and Regulations, Management of Contaminated Fisheries Regulations and Sections of the Food and Drug Regulations and Consumer Packaging and Labelling Regulations. Enforcement of provincial fish inspection legislation is also carried out in all provinces except Manitoba and Quebec.

This combined legislative base gives the Department a mandate to inspect all fish and fish products intended for export from Canada or for inter-provincial trade, all fish and fish products imported into Canada, and most fish and fish products for intra-provincial trade.

Inspection Services administers a multifaceted inspection program that involves setting and applying fish and fish product and processing standards to ensure that fish products are in compliance with Canadian and foreign requirements. Inspection Services are delivered nationally through a network of regionally-located offices and laboratories. Beneficiaries of this effort are the consumers of fish and fish products in Canada and abroad as well as the Canadian fishing industry, whose product enjoys a worldwide reputation for quality. Approximately 80 per cent of domestic production is exported, while nearly 50 per cent of fish and fish products consumed by Canadians is imported.

In the domestic industry, Inspection Services inspects fish at all stages of production, from harvesting sites and vessels through to production and distribution. Beginning in Fiscal Year 90/91, Inspection Services introduced a Quality Management Program aimed at shifting the responsibility for product quality and safety to the industry. Inspection Services' role shifts to that of monitoring industry's performance in implementing individual Quality Management Programs. Export certificates are also issued by Inspection Services in response to industry requests for product certification, thereby facilitating access of products to foreign markets.

The Department also inspects imported fish products for compliance with regulatory quality, safety and identity standards. Inspections of products involve sensory testing and chemical, microbiological or physical inspection, as appropriate. Canned products are also examined for container integrity, botulism being the main concern. Inspection Services administers an Offshore Inspection Program. This program involves inspecting major foreign processing plants serving the Canadian market to ensure that the plants

supplying the largest volume of fish to Canada are meeting the same processing standards as Canadian plants. This permits reducing the inspection of final products entering Canada and directing more effort at products supplied by plants not included in the Offshore Inspection Program.

An extensive molluscan shellfish program is in place to prevent the marketing of unsafe or unwholesome molluscan shellfish. This program involves surveys and classification of molluscan-shellfish-growing areas by Environment Canada, monitoring of the shellfish for the presence of Paralytic Shellfish Poison and other toxins, and initiation of closures of harvesting areas as required. Surveillance of growing areas is undertaken by the Fisheries and Habitat Management Division of Fisheries and Oceans Canada. A Canada-U.S. agreement on the control of molluscan shellfish harvesting, shipping and processing is an important part of this program. Shellfish agreements also exist with New Zealand, Japan and Korea.

INTERNATIONAL

Objective

To advance Canada's international fisheries interests in conservation and trade.

Description

This activity encompasses the conduct of international relations to advance Canada's fisheries conservation and trade interests, and maximize allocations to Canadians from internationally-managed fish stocks. External Affairs, International Trade Canada (EAITC) and other government departments are also involved. It includes the negotiation and administration of international treaties and agreements affecting conservation, allocations and trade, the conduct of bilateral and multilateral fisheries relations with other countries, as well as the formulation and presentation of fisheries conservation, allocation and trade positions.

International focuses on three main subject areas: Atlantic Fisheries Relations, Pacific Fisheries Relations and Trade Policy. International is accountable for policies, strategies and programs aimed at advancing, developing and protecting Canadian fisheries' conservation and trade interests, and maximizing allocations to Canadians from internationally-managed fish stocks through international fisheries relations and the settlement of issues related to maritime boundary disputes. The trade objectives include lowering tariffs and reducing non-tariff barriers, expansion of access to foreign markets, and provision of advice to EAITC on the current General Agreement on Tariffs and Trade (GATT) Multilateral Trade Negotiations and the trilateral North American Free Trade Negotiations (Canada, the United States and Mexico).

The Department participates in eight bilateral and multilateral scientific and conservation fisheries organizations. Payments to these organizations (which amount to approximately 60 per cent of the total budget for international activities) are non-discretionary obligations on behalf of Canada pursuant to various treaties and in support of Canada's foreign policy objectives. The remaining 40 per cent of the

operating budget is applied primarily to consultations and negotiation expenses associated with the conduct of international fisheries relations.

CORPORATE POLICY AND PROGRAM SUPPORT

Objective

To provide executive direction and coordination and corporate administrative services and human resource planning in support of the program; to direct acquisition and provide the framework for management of capital resources and assets for the program; to coordinate the policies and programs of the Government of Canada respecting oceans affairs; to provide assessment, analysis and policy and program planning advice respecting the current and future direction of Canadian fisheries and oceans interests; to develop and promulgate the Department's national regulations; and to direct the Department's enforcement activities.

Description

The Corporate Policy and Program Support Activity consists of three sub-activities: Corporate Policy and Administration, Capital Assets Management, and Regional Policy and Administration.

Corporate Policy and Administration

This sub-activity includes the offices of the Minister and the Deputy Minister; the corporate units reporting to the Senior Assistant Deputy Minister (Senior ADM), Corporate Management; and the units reporting to the Assistant Deputy Minister, Policy and Program Planning.

The functions carried out by the Senior ADM with respect to this sub-activity are of a coordinating and service nature to ensure the Department manages through a well-organized and coherent process and is provided with the information needed for planning, control and decision making. The following corporate functions report to the Senior ADM under the Corporate Policy and Administration sub-activity: Finance, Information Management and Technical Services; Personnel, including Human Resource Planning and Internal Audit and Evaluation. This sub-activity also includes the associated costs respecting the policy direction of the fisheries management regulations and enforcement and training functions (other costs related to the delivery of the Department's regional regulations and enforcement activities are included with the Fisheries Operations Activities).

The Assistant Deputy Minister, Policy and Program Planning is responsible for functions that relate to strategic planning and policy development of the Department. This development may reflect new initiatives or different approaches to existing policies and programs and is designed to reflect the changing environment within which the Department operates. The corporate functions for which the Assistant Deputy Minister of Policy and Program Planning is responsible include: strategic policy and planning involving policy development and coordination; economic and commercial analysis; industry development policy; federal/provincial relations; aboriginal and recreational fisheries programs and policies; the administration of the Fishing Vessel Insurance Program and the *Fisheries Improvement*

Loans Act; and the provision of policy analysis and advice for the Fisheries Prices Support Board, the Canadian Saltfish Corporation and the Freshwater Fish Marketing Corporation.

Capital Assets Management

The management of the Department's capital assets is under the direction of the Senior ADM, Corporate Management.

The Department's capital assets are estimated at $4.4 billion. They include more than 1,400 commercial fishing harbours and 841 recreational harbours serving approximately 74,000 commercial fishermen, 34,000 fishing vessels and about 5 per cent of Canada's recreational berths; a marine fleet of 20 major vessels, 49 minor and 202 small vessels, as well as some 1,500 smaller craft; 11 major scientific installations and more than 700 other offices and facilities; and scientific equipment, vehicles and machinery.

The Capital Assets Management sub-activity is responsible for:

- development and implementation of a long-term plan for a national system for small craft harbours to support commercial fishing and recreational boating, including maintenance, renovation and acquisition of harbours and harbour facilities; and

- development and execution of long-term and short-term policies, plans and budgets for the acquisition, maintenance, management, use and disposal of departmental capital assets to meet program needs cost effectively. This sub-activity also includes costs related to major vessel and real property acquisition, major construction activities, and the purchasing and contracting of commodities and services. Regional resources dedicated to the management of assets are included in the sub-activity dealing with Regional Policy and Administration, as are the costs of shared-use assets such as data processing installations and office buildings supporting more than one activity. The costs related to the acquisition of all other classes of assets and the costs of asset maintenance and operation are reported with the activity supported by the assets.

Regional Policy and Administration

This sub-activity includes the offices of the Department's six regional Directors General and the provision of administrative and support services such as management, finance and planning, personnel and communication services to the program at the regional level.

HIGHLIGHTS OF THE YEAR

KEY DEVELOPMENTS

Northern Cod Adjustment and Recovery Program (NCARP) On July 2, 1992, the Minister announced a two-year moratorium on all northern cod fishing (the offshore fishery had been effectively closed the previous February). A compensation and adjustment package was announced shortly after to help the people most affected by the moratorium. Individuals were offered training to help them find work outside the fishery or skill upgrading if they preferred to stay in the industry. The package also included early retirement opportunities, licence retirement for those leaving the fishery and special payments to help owners maintain and store their vessels and gear during the moratorium.

New Atlantic Bodies The *Fisheries Resource Conservation Council (FRCC)* was established to advise the Minister on research and assessment priorities and methodologies, conduct public hearings to review scientific stock advice, and make formal recommendations to the Minister on Total Allowable Catches (TACs) and conservation measures. The *Panel on the Use of Foreign Vessels* considers availability of fish for foreign allocations and the use of foreign vessels. It gives all stakeholders — provinces, industry and the federal government — direct input into decisions regarding foreign fishing in Canadian waters. Both panels give the fishing industry a greater partnership with government in fisheries decisions.

Task Force on Incomes and Adjustment The moratorium on northern cod, significant reductions in other groundfish stocks and the 1991 catch failure led the government to establish a Task Force on Incomes and Adjustment in the Atlantic Fishery to develop a comprehensive strategy to solve the income security difficulties the Atlantic fishing industry has long faced. The Task Force was asked to advise on the continued supply of the resource, future stability and profitability of the industry, alternative training measures, and employment and adjustment possibilities. The Task Force report is expected in 1993/94.

Aboriginal Fisheries Strategy On June 29, 1992 the Minister announced the seven-year, $140 million Aboriginal Fisheries Strategy (AFS) aimed at increasing the participation of Aboriginal groups in the management of fisheries resources traditionally used by them. More than 100 agreements were signed under the AFS. Most of these agreements related to the Aboriginal fisheries on the West and East coasts, and some $18 million was transferred to Aboriginal groups. Other agreements will be negotiated, including interim ones to serve until land claims are resolved. The AFS includes $7 million to compensate commercial salmon fishermen in British Columbia who voluntarily retire their licences to enable reallocations between sectors to be assigned to Native people.

United Nations Conference on Environment and Development (UNCED) A major event in June 1992 was the Earth Summit meeting in Brazil. Considerable work in terms of position papers and preparatory and other international meetings preceded the conference and additional work followed it. Canada had many successes at the Brazil meeting, particularly with regard to fisheries and oceans. Canada led the drive at UNCED to gain international agreement to hold a United Nations conference to improve high-seas fisheries cooperation and address the conservation and management of migratory and straddling stocks. (The Law of the Sea Convention gives coastal states such as Canada the exclusive right to use, control and manage fisheries within their 200-mile zones; beyond that, regional or multilateral

organizations are responsible for the conservation of fish stocks. However, many nations either do not belong to the organizations or ignore their quotas. Such overfishing is one reason why Grand Banks stocks collapsed.) Other fisheries and oceans issues discussed at UNCED included land-based sources of marine pollution, small-island states, integrated management of coastal and marine areas, conserving living resources in both national waters and on the high seas, the role of oceans in climate change and the need for countries to work together to solve marine problems. In January 1993, Canada hosted a meeting of representatives from 48 countries to prepare for the upcoming U.N. conference on high-seas fisheries which would take place in two sessions in 1993, with a final report in autumn 1994.

Canada/France Fisheries Relations On June 10, 1992, an International Court confirmed Canada's jurisdiction over disputed waters south of Newfoundland around St. Pierre and Miquelon. At issue were the fishing and potential oil and gas resources in zone 3Ps and St. Pierre Bank. The Court awarded France about 18 per cent of its claim, giving France significant scallop resources but effectively awarding to Canada management control of 3Ps groundfish. (Cod is the most important species in the area. The decision gives France 9 per cent of the cod biomass, 6 per cent of the redfish and 15 per cent of the plaice as opposed to its claim of 50, 48 and 37 per cent respectively.) However, after the court decision, Canada and France could not agree on quotas and Canada set quotas for France unilaterally, taking into account the new boundaries, species biomass, its obligation to protect the stocks and the absence of an agreement with France ensuring its cooperation in conservation and management efforts.

Canada/EC Agreement In December 1992, Canada and the European Community initiated an agreement on measures to end long-standing fisheries disagreements. When the agreement comes into force, both parties will comply with NAFO conservation and management decisions and ensure that their fleets obey their quotas. (The EC had been setting, and exceeding, its own quotas.) They will help improve NAFO's ability to deal with disputes and surveillance and control, and will work to end fishing by non-NAFO vessels. Canada would base the northern cod TAC on advice from Canadian and international scientists and, because about 5 per cent of the biomass is outside 200 miles, ask NAFO to allocate that proportion of the TAC to NAFO members. Canada will authorize EC access to Canadian ports, surplus allocations (if any) and commercial arrangements. The agreement, when brought into force, can be terminated with 60 days' notice.

The Quality Management Program (QMP) The QMP became a mandatory requirement for federally registered fish-processing establishments. The QMP is recognized internationally as an effective method of delivering a complex inspection program and will be instrumental in maintaining and gaining ready access to world markets. A computer-based information system (QINFO), designed to track QMP inspections and the status of industry compliance, became fully operational in January 1993.

OTHER ACHIEVEMENTS

Science

Fisheries Resource Assessment and Research The Science Sector assessed major stocks of exploited species of anadromous and marine fish, invertebrates, mammals and plants in Canada's Atlantic, Pacific, Arctic and marine waters, as well as freshwater fish in the Yukon and Northwest Territories. It conducted research on the biology and population of the stocks and provided scientific information and advice to fishery managers. Such inputs constitute the biological basis for managing the fisheries. On the Atlantic coast, the Science Sector implemented a process to review the scientific basis for the formulation of advice on groundfish stocks through the new Fisheries Resource Conservation Council. Internationally, the Science Sector continued to provide scientific data, stock assessments and advice on the consequences of fisheries management options for shared stocks. Extensive analyses were provided in support of bilateral negotiations with the U.S. on sharing the transboundary Pacific hake stock.

AFAP and QFFDP Under the Atlantic Fisheries Adjustment Program, the Science Sector continued research on northern cod, Gulf of St. Lawrence snow crab, grey seal and sealworm; and funded private sector research projects on aquaculture. Under the Quebec Federal Fisheries Development Program, studies were conducted on cod, snow crabs, scallops, mackerel and marine mammals.

Aboriginal Fisheries Research To facilitate Native co-management of fisheries resources, workshops were conducted on sockeye salmon productivity and habitat. The development of community based fisheries monitoring continued in the Arctic. Under the Inuvialuit Fisheries Joint Management Committee, joint projects were conducted on broad whitefish, Arctic charr, marine fishes and beluga whales. An aerial survey of beluga whales in Ungava Bay was conducted as a cooperative project with the Makivik Corporation. Salmon assessment traps were installed on five rivers in New Brunswick and were operated jointly with Aboriginal groups.

Ocean Environment and Fish Recruitment The Science Sector conducted research on the effect of changes in the ocean environment on the recruitment and distribution of fish populations, including rockfish in the Strait of Georgia (between Vancouver Island and the mainland), cod in the northern Gulf of St. Lawrence, groundfish on the Scotian Shelf, northern cod off Newfoundland, and redfish on the Flemish Cap. It also initiated a multidisciplinary study on the environment and biological resources in Hudson Bay, including assessment of marine mammal stocks.

Aquaculture To improve the profitability of aquaculture, studies were done on salmonids, a number of marine finfish and shellfish species, with a focus on nutrition, genetics, biotechnology, physiology, culture systems, disease control and vaccine development. Highlights include the development of gene probes to determine the sex and to differentiate between stocks of Pacific salmon; a marked increase in the growth of cultured coho salmon through genetic engineering; the transfer of Arctic charr culture technology to industry; and the development of a decision support model for siting of fish farms. Work was also undertaken on developing a continental approach to fish health protection under the *North American Free Trade Act*, and minimizing introductions of unwanted species and genetic strains.

Salmon Enhancement The Science Sector continued lake enrichment projects in British Columbia to increase the availability of sockeye salmon for commercial harvesting. On the Atlantic coast, 2.8 million Atlantic salmon smolts were produced and released in 30 rivers in Nova Scotia and southern New Brunswick. Final major construction was completed to provide access for salmon to most of the Exploits River in Newfoundland was also completed.

Habitat Science In response to Pacific coast blooms of toxic algae that produced the toxin domoic acid, the Science Sector undertook studies on relevant algae to enable forecasting of such bloom and to assess the impact on the food chain. Food chain studies were also initiated in the Peace, Athabasca and Slave River basins to assess the impact of industrial developments. The Science Sector completed biomonitoring on Lake Ontario for modelling the impacts of fisheries and habitat management decisions; continued studies relevant to assessing the environmental impact of the Grande-Baleine and Conawapa hydroelectric projects; continued the long-term multi-agency forestry impact study in New Brunswick; and initiated studies on the impact of mobile fishing gear on marine substrate fauna.

Physical Oceanography in Support of Fisheries Ocean environment monitoring continued in support of studies on fish recruitment on both the Pacific and Atlantic coasts. Assistance was provided to the aquaculture industry for characterizing the suitability of selected locations for aquaculture. In relation to potential oil drilling, an ecological model of tidal mixing is being developed for the Gulf of Maine/Georges Bank area that would predict the movement of water masses and the fish eggs and larvae.

Inland, Coastal and Ocean Information Network (ICOIN) Under the Green Plan, DFO continued to increase coastal sensitivity mapping of habitats and resources in all regions, has developed contingency plans for environmental emergencies, and promoted response training of DFO personnel.

Climate Change DFO and other Canadian organizations are key contributors to two long-term international ocean/climate programs: the World Ocean Circulation Experiment (WOCE) and the Joint Global Ocean Flux Study (JGOFS). Both programs help to understand how oceans and atmosphere interact to affect climate. In 1992/93, a national ocean climate committee was established to guide objectives and research proceeded on ocean conditions, circulation and carbon dioxide flux.

Ocean Environment and Fish Recruitment The Science Sector continued to study the effects of ocean environment on fish population dynamics, recruitment and distribution. It also coordinated Canada's participation in the Intergovernmental Oceanographic Commission. Key programs took place off Vancouver Island and on La Perouse Bank. Studies relating environmental conditions and marine ecosystems continued on the Scotian Shelf, including a special phytoplankton study in L'Etang Inlet. Progress was made on an ecological model for active tidal mixing in the Gulf of Maine.

Contaminants Research DFO assesses, monitors and researches the impact of toxic chemicals on fisheries. A new dioxin analysis facility was completed in British Columbia and several studies on the effects of pulp mill effluents were done. Other studies included: dioxins in sediments in the Fraser River basin; surface currents off northern British Columbia under the Panel on Energy Research and

Development (PERD); oil development in the Beaufort Sea; fish response to effluents at several pulp mills in the Great Lakes basin; contaminants in Arctic fish led by Indian and Northern Affairs; cadmium studies at the Experimental Lakes Area near Kenora, Ontario; and industrial and aquaculture contaminants in the Miramichi area near L'Etang Inlet.

Industrial Effluents The Science Sector investigates chemical sources and pathways in aquatic ecosystems and the impact of persistent man-made contaminants on fish. This includes programs and projects to test and curb dioxin and furan levels in waters near pulp and paper mills using chlorine bleach. In 1992/93, a six-year research program in toxic chemicals was established and work began to develop requirements for the metal mining sector. Environmental effects monitoring requirements for pulp and paper mills came into force in May 1992.

Hydrography In late 1991, CHS received funding for the development of electronic charting technology and required infrastructure. During 1992-93 the following major accomplishments were realized in an Electronic Chart Pilot Project: digital chart file standards were developed; the digital conversion of CHS documents continued; thirty CHS charts were digitized, checked and verified; and the six CHS-owned Electronic Chart systems, which are in place on various Canadian vessels, were updated to International Maritime Organization specifications.

Fisheries and Habitat Management

Licence and Allocation Reform The department continued work in 1992/93 to pave the way for the establishment of two independent boards, one on each coast, to grant licences, allocate resources and apply enforcement sanctions. The boards, which are intended to operate at arm's length from the government but adhere to ministerial policies, would give the fishing industry more say in how it is run and make the decision-making process more open to public view. Also part of the reform measures was the overhaul of Atlantic licensing policy to limit entry and participation to serious, professional fishermen.

New Marine Mammal Regulations *The Marine Mammal Regulations*, a consolidation of previous regulations governing seals, belugas, cetaceans, narwhals and walrus, came into effect in February, 1993. These simplified regulations govern the commercial seal hunt and Aboriginal subsistence hunts for various species of pinnipeds and cetaceans. They also prohibit the disturbance of marine mammals by persons engaged in whale watching or other activities not related to the licensed hunt.

Atlantic Coast Seal Hunt Seal landings in the Atlantic coast hunt in the Spring of 1992 remained at about one third of the TAC of 186,000 harp seals. The hunt is inshore and carried out by fishermen using longliners, small boats and snowmobiles. The prohibitions on vessels over 65 feet long and commercial catches of whitecoat harp seals and blueback hooded seals remained in effect.

Groundfish Management Plan The 1993 Atlantic Groundfish Management Plan centred on protecting stocks and enhancing government/industry partnerships. Most total allowable catches (TACs) were reduced, some cod fisheries were closed, groundfish fleets in the Gulf of St. Lawrence and eastern Scotian Shelf were required to start submitting harvesting plans, and new conservation and enforcement measures

were introduced. Quota reductions were shared proportionately among gear sectors; the people most seriously affected were helped through the adjustment period. Federal and provincial governments and industry agreed to work together to reduce groundfish harvesting and processing capacity, assess stocks, change licensing and allocation processes, and address enforcement and penalties.

Industry Takes Over Dockside Monitoring In June 1992, the private sector took primary responsibility for the dockside monitoring program which verifies landings under Individual Quota (IQ) and other catch-sharing arrangements. These arrangements were set up in 1988 on the understanding that participants would design and manage the program and eventually assume financial responsibility for it.

Sockeye Task Force A task force was assigned in autumn 1992 to study Fraser River sockeye returns. The move followed substantial discrepancies in the number of fish entering the river, reported catches and the number that reach spawning grounds. The unit was charged with examining management activities and catch data, conducting biological studies, tracking catches from the river to final destination and reviewing upstream enumeration methods in selected spots.

Inspection

Shellfish Monitoring DFO regularly monitors all shellfish harvesting areas for marine toxins. In 1992/93, it analyzed more than 15,000 samples for paralytic shellfish poison (PSP) and domoic acid. Harvesting areas were closed when necessary and no illnesses from commercially-harvested shellfish were reported.

Import/Offshore Inspections The Inspection Import System (INIM) became fully operational in June 1992. It involves 23 import centres. Border blitzes were carried out to identify non-licensed importers and products that do not comply. Audits of foreign processors were conducted in Thailand and the Philippines.

Control Over Foreign Fishing DFO enforcement provided effective monitoring and control of foreign fishing vessels operating in Canadian waters and monitoring of those fishing in the NAFO Regulatory Area.

International

Foreign Overfishing Canada continued its ongoing campaign to halt foreign overfishing outside the Atlantic 200-mile zone. The Minister met with his counterpart in Panama to encourage Panama to stop vessels carrying its flag from fishing in the area. Newfoundland community leaders visited seven European Community countries to explain the devastation caused by overfishing. Canada asked NAFO to hold special meetings to devise new surveillance and control measures (these were later adopted at the annual meeting) and encourage members to help save the stocks.

International Trade Canada tabled proposals in the Uruguay Round of the GATT talks for global free trade in fish products on a reciprocal basis and participated in fisheries negotiations on market access. A GATT Group on Environment and Trade was activated to review measures in support of international

conservation and environment agreements. The North American Free Trade Agreement signed in September 1992 is expected to benefit the fisheries sector.

Pacific Salmon Under the 1985 Pacific Salmon Treaty, Canada and the U.S. negotiate fishing regimes for various salmon interception fisheries. Talks in 1992/93 were particularly difficult as they concerned renegotiation of major provisions concerning the U.S. interception of Fraser River pinks and sockeye, and the U.S.'s deliberate overharvesting of Fraser sockeye in 1992. Other important issues involved coho and chinook catch limits and transboundary river harvest shares. Progress was made toward a Yukon salmon interception agreement.

North Pacific High-Seas Salmon Fishing An international agreement prohibiting salmon fishing on the North Pacific high seas was ratified by four parties (Canada, Japan, Russia and the U.S.) and came into force February 16, 1993. It also calls for stricter controls on high-seas salmon by-catches and established the North Pacific Anadromous Fish Commission, based in Vancouver, to ensure that the convention's objectives are met.

Japanese Tuna Quota Since 1981, the number of Japanese vessels licensed to catch bluefin tuna in Canadian waters has dropped from more than 100 to 16 in 1992. Last year, the quota was set at 162 tonnes, down from 180 tonnes in 1991. This highly migratory species is managed by the International Commission for the Conservation of Atlantic Tunas which sets quotas for Canada, the U.S. and Japan.

Corporate Policy and Program Support

Fishery Regulations Streamlined, Consolidated In February 1993, the department finished streamlining and consolidating a national set of regulations that establish a basic framework for Canada's fisheries. These regulations are now simpler, clearer and less expensive to follow and enforce. Rules were standardized across fisheries as much as possible, and conflicts and ambiguities removed. The streamlining is a continuing part of the government's overall regulatory reform strategy.

Cooperative Agreements The department continued to work with provinces on sub-agreements to increase fisheries resources, improve harvesting methods and promote fleet rationalization. Two agreements totalling $60 million were signed with Newfoundland in 1992 — a two-year agreement on commercial salmon licences retirement and a five-year agreement on salmonid conservation and enhancement. Canada also entered into agreements in 1992 with Nova Scotia and New Brunswick regarding recreational fisheries, and with Prince Edward Island and the Atlantic Canada Opportunities Agency (ACOA) regarding sustainable development. Altogether, 3,815 projects are underway under the sub-agreements.

Agreements with Lower Fraser Aboriginal Groups Agreements on harvesting and cooperative management plans for Aboriginal fisheries on the lower Fraser River were reached in June 1992. They establish salmon allocations to the Sto:lo Nation and Tribal Council and the Musqueam and Tsawwassen nations. They also provide for test projects regarding commercial sales of Native-harvested salmon in 1992. Harvests were authorized under communal fishing licences, monitored and managed jointly with

DFO, and sold subject to applicable laws and regulations. The Lower Fraser Fishing Authority, a new group representing the three Native Nations, was allocated 395,000 sockeye, 1,250 chinook, 12,000 chum and 6,500 coho after mid September. Fish for food, social or ceremonial purposes comes from this total allocation, and the fishery closes after these levels are reached. Some $1.3 million went to training and equipping Native guardians for fisheries management, catch monitoring and enforcement, and data collection.

Changes to Vessel Insurance Plan In April 1992, the Minister announced changes to the Fishing Vessel Insurance Plan (FVIP). The changes included moving operational headquarters from Ottawa to St. John's Newfoundland, reducing the six FVIP regions to four, assigning a general manager and specialized staff, and processing claims and appraisals faster. In 1990/91, FVIP provided over $2 million in coverage to more than 6,500 vessels.

Aquaculture Supply Industry In June 1992, the department released "Suppliers to the Aquaculture Industry — an Overview" which assessed the size and economic impact of the aquaculture supply industry. Some 435 companies provide goods and services to the aquaculture sector — half in British Columbia, one quarter in Atlantic provinces, and the remainder in Quebec, Ontario, the prairie provinces and territories. They generated $266 million in sales (not all were directly related to aquaculture) — 48 per cent, feed sales; 17 per cent, machinery and equipment; 6 per cent, smolts/hatcheries; 6 per cent, processing; 5 per cent, nets; other goods and services, 18 per cent. Revenues were down 3 per cent in 1991 but participants reported they remain optimistic. Half the suppliers serve industries other than aquaculture and 37 per cent are active in export markets.

Small Craft Harbours By the end of 1992/93, 2,000 harbour projects were underway. Emphasis was placed on those projects required for health or safety reasons. As well, 16 new harbour authorities were set up at 27 sites for a total of 159 at 231 harbours across the country.

Arrow Post The *Arrow Post* was christened on May 20, 1992. It replaces a 36-year-old vessel of the same name. Its job is to patrol the Queen Charlotte Islands and the international boundary between Alaska and British Columbia waters, and conduct search and rescue missions.

Capital Assets Under the department's capital investment strategy, DFO conducted comprehensive reviews of major asset categories that resulted in more than 100 facilities being identified for disposal, 8 per cent fewer automobiles and the retirement of seven vessels.

PERFORMANCE OF THE FISHERIES AND OCEANS SECTORS

Canada's oceans and waterways are of major economic, social and strategic importance. Surrounded by three oceans, Canada has the world's longest coastline. The continental shelf covers some 3.7 million square kilometres, equivalent to almost 40 per cent of the country's land area. About one in five Canadians lives next to one of the three oceans. Most of Canada's cities sit next to an ocean or major body of water. Almost 8 per cent of Canada's landmass is covered by freshwater (an amount equal to 16 per cent of the world's total).

Twenty-five per cent of Canada's Gross National Product is based on trade with foreign countries and more than half of this trade moves by water. The seas also have a significant impact on weather and climate, and therefore determine to some extent the success of the agricultural, forest and tourism industries.

Ocean-related activities, including fishing, aquaculture, development of offshore resources, trade, recreational enterprises, and related goods and services, employ more than 165,000 people. These activities are worth $7.9 billion of Canada's Gross National Product.

The Fishing Industry

Canada has one of the world's largest commercial fishing industries. It operates in three broad regions — along the Atlantic and Pacific coasts and inland, mainly near the Great Lakes and in central Canada. The three commercial fisheries differ considerably in size, industrial structure, species, technology and products.

About 80 per cent of the more than 150,000 people doing ocean-related jobs work directly or indirectly in fishing and fish processing. This includes 87,000 licensed commercial fishermen, 79,000 of whom work in the coastal fisheries and over 8,000 in the freshwater fishery.

While commercial fishing is not a significant factor in the aggregate national economy (approximately 0.5 per cent of the Gross National Product), it is a major contributor to the economies of the coastal provinces and northern communities. On the Atlantic coast, for example, one in four residents lives in 1,300 fishing communities, and half of these communities have depended on fishing for their existence. In the North, where up to 90 per cent of fishermen are Native peoples, fishing provides not only a diet supplement but a source of cash income where other employment is limited or non-existent.

Landings (1992) Canada's overall commercial landings were 1.1 million tonnes valued just over $1.3 billion, down from the previous year's totals of 1.3 million tonnes worth $1.5 billion. On the Atlantic coast, groundfish landings were 455,281 tonnes valued at $309 million; pelagics were 269,867 tonnes valued at $62 million; and shellfish, 226,386 tonnes valued at $561 million. Pacific landings of groundfish were 87,789 tonnes worth $81 million; pelagics, 103,304 tonnes worth $210 million; and shellfish, 28,861 tonnes worth $57 million. Freshwater landings and values are not available.

Production (1992) Canada's fishing industry produced some 695,760 tonnes of products worth $2.9 billion. Atlantic-coast production was 508,270 tonnes worth $2.0 billion; Pacific, 152,490 tonnes worth $733 million; and inland, 35,000 tonnes valued at $160 million.

Exports (1992) Canada exports about 80 per cent of the value of its fishery products. In 1992, Canada exported 529,907 tonnes worth $2.5 billion. Main markets were the U.S., EEC and Japan.

Imports (1992) Canada imported 204,050 tonnes of fishery products worth $782 million.

Recreational Fishing Every five years, DFO does a national sportfishing survey. The most recent one (1990) shows that Canadians and tourists spend about $4.7 billion a year on recreational fishing. Almost 6.5 million persons, including more than 900,000 from other countries (primarily the United States), take part in this sport. Of these, 4.6 million are adults who average 14.5 days of fishing a year for a total of 67 million fishing days per annum. Ontario is the most popular angling province, accounting for almost half the fishing effort of Canadians and almost two thirds of visitors' angling.

Native Food Fisheries The catches by Native peoples for food and ceremonial purposes are an important part of the Canadian fishery. While no data are available on the size of the Native catch on a national basis, this fishery is particularly important in British Columbia where there are approximately 90,000 status Indians and 192 bands on 1,600 reserves. Excluding their participation in the commercial fisheries, it is estimated that British Columbia Natives catch about 1 million salmon (approximately 3 per cent of the region's total salmon landings) for food and ceremonial purposes.

Current national policy initiatives seek to integrate Aboriginal fisheries into overall fishing plans and involve Native people in stock conservation and management. Land-claim negotiations in the North, British Columbia and eastern Canada, together with the constitutional process and interpretation of treaty entitlements, will help to clarify the nature and extent of the hunting and fishing rights of Native peoples.

Aquaculture Aquaculture involves the cultivation of aquatic organisms including finfish, molluscs, crustaceans and aquatic plants. Canada's aquaculture industry is a mosaic of small family operations, publicly owned and listed companies, and subsidiaries of large corporations involved in international seafood markets and foreign-owned enterprises.

All aquaculture areas of the country produce trout. In addition, British Columbia produces salmon, oysters, clams, sable fish and marine plants. The Prairie provinces and Ontario are expanding into Arctic char. Ontario and Quebec (which also produces mussels) are exploring salmon. In the Atlantic provinces, a well-established aquaculture sector based on salmon, trout, Irish moss, mussels and oysters is now diversifying into scallops, cod, steelhead, halibut and Arctic char.

A 1989/90 study of Canadian aquaculture confirms that the industry has expanded rapidly in the past 15 years and will likely continue to grow at even higher rates. The latest data indicates that it increased in value from $7 million in 1984 to $109 million in 1988 to $220 million in 1992. Aquaculture represented 3

per cent of the value of landed fisheries in 1987, 18 per cent in 1992 and could reach 25 per cent by the year 2000.

A combination of factors fuels this expansion: growing demand for seafood; increasing reliance by processors on aquaculture products which they see as a dependable year-round commodity; and widespread recognition that Canada produces excellent aquaculture products. However, while the forecast looks good, certain considerations remain: new sources of supply have reduced prices for some species; processing, cultivation and distribution costs put pressure on some profit margins; and competition intensifies.

In 1988, aquaculture accounted for 1,500 jobs; by 1991 the figure was 2,825 and by the year 2000 it could reach 5,000. This creates spin-off employment in businesses such as feed processing, and cage, equipment and net manufacturing, and in services such as marketing, distribution and fish health. An additional 2,355 jobs exist in the supply side of the industry. These jobs are particularly important in areas such as Atlantic Canada where economic development opportunities are limited.

Aquaculture is a joint federal/provincial activity with respective roles defined through Memoranda of Understanding. MOUs are customized to meet the needs of the industry in each province/territory and to reduce the industry's overall administrative and legal burden.

Oceans Industries

Canada's oceans-related industries contribute significantly to the country's economy in terms of investment potential, technological development and export opportunities.

Oceans Manufacturing and Services Canadian oceans manufacturing and services firms are world-renowned for their science, technology and engineering excellence. Products range from oceanographic and hydrographic instruments to remote sensing, submersibles and seabed systems. Areas of particular growth are information services, including data capture and interpretation, and marine environmental consulting services.

Despite its relatively small size, this dynamic group of companies provides critical support and an infrastructure to the entire oceans sector. It has grown quickly over the past 10 years due to a number of reasons: commercial opportunities created by national institutes in marine fisheries, engineering, and environmental and resources sciences; government contracts and science and technology spending; and, in particular, offshore oil and gas exploration.

Offshore Oil and Gas Canada's offshore areas contain substantial reserves of oil and gas. The east-coast offshore region alone holds 30 per cent of Canada's oil potential and 17 per cent of its gas potential. Offshore exploration faces unique challenges such as great distances from supply bases and exposure to open ocean weather, drifting pack ice, icebergs and the multiple-year ice of the Arctic Ocean. New technologies, improved environmental information and specialized scientific services are required to meet these challenges.

Offshore Mining Historically, the private sector has not shown widespread interest in exploring and developing offshore mineral deposits. However, in the long term, there may be some potential for ocean mining in the seabed beyond the 200-mile zone. Over the past 15 years, multinational consortia, in which Canadian companies have interests, have been among the entities investing in exploration in the area. For the foreseeable future, however, economic and legal uncertainties will prohibit more rapid development.

Marine Shipping Canada has concentrated on developing its St. Lawrence Seaway fleet because of the fleet's importance to the economy and the need for efficient, economical transportation of the country's resource materials, leaving the deep-sea business to operate under existing international competitive market conditions. More recently, however, lake vessels have been built with ocean-going capabilities. As the aging domestic fleet is gradually replaced, Canada will be able to increase its share of international shipping expenditures.

Shipbuilding and Repair Canada is a marginal supplier in world shipbuilding. With the currently soft international markets, Canada is concentrating on its domestic market. At present, Canadian capacity is more than sufficient for meeting anticipated domestic demand.