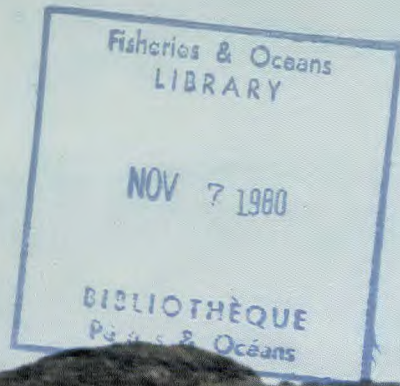




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1979 ANNUAL REPORT

Newfoundland Region



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NEWFOUNDLAND REGION

1979 ANNUAL REPORT

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DEPARTMENT OF FISHERIES AND OCEANS

NEWFOUNDLAND REGION

NEWFOUNDLAND FISHERIES IN 1979

The Statistics and Computer Services Division of the Economic Services Branch, federal Department of Fisheries and Oceans, reports that Newfoundland seafish landings in 1979 amounted to 1.2 billion pounds, up 18 per cent from the previous year's catch of 1.02 billion pounds. (Preliminary Statistics - 1979)

The gross value of 150 million dollars is up 30 per cent from the landed value of 115 million for 1978.

Groundfish landings amounted to 793 million pounds in 1979 compared with 716 million pounds landed in 1978. Cod landings increased 18 per cent from the 1978 catch of 381 million pounds to 451 million pounds in 1979.

The flounder catch increased from 161 million pounds in 1978 to 162 million pounds in 1979. Greysole landings in 1979 amounted to 16 million pounds compared with 17 million pounds in 1978 for a decrease of six per cent. The redfish catch of 83 million pounds is down three per cent from the 1978 catch of 86 million pounds. Landings of greenland turbot in 1979 amounted to 68 million pounds compared with 56 million pounds in 1978 for an increase of 21 per cent. Other groundfish species amounted to 14 million pounds in 1979. This compares with 13 million pounds the year before.

Landings of pelagic and estuarial amounted to 195 million pounds, this compares with 179 million pounds landed in 1978. Herring landings totalled 113 million pounds compared with 101 million pounds in the previous year. Salmon landings amounted to 2.1 million pounds compared with 2.6 million pounds in 1978. The capelin catch amounted to 41.4 million pounds compared to 40 million in 1978, and mackerel landings totalled 32 million pounds, compared to 30 million the previous year.

Landings of molluscs and crustaceans amounted to 214 million pounds compared to 128 million pounds in 1978. The lobster catch amounted to 5.6 million pounds, the same quantity as in 1978. Crab landings increased from 16.7 million pounds in 1978 to 24.3 million pounds in 1979. Squid landings in 1979 amounted to 175 million pounds compared with 97 million pounds the previous year.

The total number of licenced fishermen exceeded 32,000 in 1979, with over 30,000 involved in the inshore fishery and 2,000 in the offshore fishery.

Salted Cod

Salted cod production decreased to 15 million pounds dry weight in 1979 from 20 million pounds in 1978. The percentage of the total cod landings used for salting decreased to 15 per cent in 1979 compared with 26 the previous year.

Frozen Groundfish

Production of frozen groundfish increased from 166 million pounds in 1978 to 202 million in 1979. Frozen cod products accounted for 50 per cent of the frozen groundfish production, followed by flounder at 21 per cent, redfish at 10 per cent and turbot at 7 per cent.

ECONOMIC SERVICES BRANCH

ECONOMIC AND COMMERCIAL ANALYSIS DIVISION

The objectives and activities of the Economic and Commercial Analysis Division are basically three-fold. The first objective is to perform a comprehensive economic advisory function in support of the Region's responsibilities in fisheries management (licence limitation, optimum size and composition of the domestic fleet, optimum allocation of access to resources between domestic and foreign fleets, etc.).

To this end, the Division has in the past year, completed a major review of the inshore herring fishery in Newfoundland. This study showed that management measures in addition to limiting entrants are necessary to provide economic viability to the fleet. An economic assessment of the cod trap fishery is nearing completion. In the past year, the Division also completed a major reassessment of processing plant capacity and utilization and completed an inventory of financial assistance programs offered by Federal/Provincial departments and agencies. Technical assistance was also provided to the review of Atlantic Coast licensing.

The Division provides economic support to various fishery advisory committees on such species as Lobster, Crab, Shrimp, Inshore Groundfish, Salmon and Herring. The Division also contributed to the Northern Cod Seminar in Corner Brook and participated in the Squid Fishery Seminar in Nova Scotia.

The second objective of the Division is to provide economic support to the Region's responsibilities in fisheries development. This function largely consists of providing advice to other government departments and agencies. These activities involve the assessing of applications for public financial assistance to establish, expand, and/or modernize fish processing facilities taking into account such factors as resource availability, harvesting capability, processing capability, and available markets. In the past year, the Division assessed 76 development projects,

having a capital value of \$56.9 million comprising the following:-

- Industrial Incentive Grant Applications under the Regional Development Incentives Act, administered by the Department of Regional Economic Expansion;
- Loan applications administered by the Newfoundland and Labrador Development Corporation;
- Industrial Incentive Grant and Loan Applications under the Federal-Provincial Industrial Grants and Loan Program (ARDA) administered by the Department of Rural Development of Newfoundland and Labrador.

Further, the Division provides input into special programs that have a bearing on fisheries matters but which are often administered by other Departments. During the past year, involvement with the Canada Works Program in the assessing of projects related to onshore processing facilities provided the Division an avenue for economic input into developmental projects sponsored by the Canada Employment and Immigration Commission. Twenty three Canada Works assessments were undertaken by the Division. In addition, as a result of special proposed agreements between DREE and the Province, the Division was requested to undertake studies and evaluations of major Provincial proposals relating to the establishment of a centralized landing port and public cold storage for the holding of frozen fishery products, and the development of the coastal fisheries in Labrador.

The Division also provides economic advice to special committees set up in other Branches within the Department. For example, the Division contributed to the establishing of a National Small Craft Harbour Policy, in terms of economic rationale, goals and implementation of a Small Crafts Harbour Program.

The third objective of the Division is to assess the commercial advantages for the Atlantic Coast fishing industry from effective administration of extended jurisdiction, of controlling foreign fleets, and ensuring through evaluation, that cooperative fishing arrangements with foreign companies are approved and carried out in accordance with Ministerial Policies for such ventures. The Division administered foreign charter arrangements which took place in Newfoundland in 1979 and included plant extension charters, developmental fishing charters for offshore squid, the over-the-side sales arrangements, and supply for resource-short plant programs.

FISHING AND INDUSTRY SERVICES

INSPECTION AND TECHNOLOGY BRANCH

The statutory responsibility of the Inspection and Technology Branch is to ensure that only wholesome, acceptable quality, Canadian fish reaches consumers in various markets of the world. In order to achieve this goal, the Branch has a staff of 98 persons in the Newfoundland Region

to monitor the quality of fish and fish products and to provide advice on improvement of quality from harvesting through distribution.

Special emphasis continued this year to be placed on conditions on board fishing vessels. By year's end, a total of almost 1,000 boats had been surveyed for construction and sanitary requirements. The dockside grading of landed quality of fish and the monitoring of off-loading facilities continued to be important duties of the field officers' job.

Methods of transportation were observed in various areas of the Region and where breaches of the Fish Inspection Regulations occurred, violators were prosecuted and fined accordingly.

All fish processing establishments must be registered by this Department, and at the close of 1979, the Region had 203 registered plants, an increase of 17 per cent over 1978. Registered operations within these plants increased to 311 representing an increase of 13 per cent in the past year.

During the month of January, a group of 15 Inspection Officers of the Inspection and Technology Branch attended a one-week seminar relating to pickle fish inspection which became necessary due to changing market requirements.

In February, both the Chief and Associate Chief of the Inspection and Technology Branch visited Japan on separate occasions to observe fish processing techniques on various fish species, primarily squid and mackerel, and to provide input to the worldwide marketing study being conducted by the Department.

Approval was received in March to extend the Fish Chilling Assistance Program for the fiscal year 1979/80. \$800,000 was approved for this Region. Approximately 54 applications for assistance were received prior to the deadline of September 30, 1979. Of these, 24 were approved which resulted in increasing the regional daily ice making capacity by 380 tons, and the daily ice holding capacity by 770 tons.

In May the Chief of the Branch was requested to attend international fish quality standards meetings in Norway and while in Europe visited Iceland and Denmark to observe various details of their respective fish processing industries. In the same month, acting on a request from industry, two Inspection Officers undertook an experiment to attempt to determine the feasibility of Atlantic Herring Roe processing in this Region. Although the experiment was done on a small scale, results proved quite satisfactory to the various processors who viewed the final product as well as to their market representatives from Japan. It is hoped that during 1980/81, funding will be made available to continue further experimentation on this product.

In June, a seminar was held between the Branch, the Canadian Saltfish Corporation and its agents, relative to new European market requirements for heavy salted codfish, particularly to the Spanish market.

A representative of the Branch visited Cuba at the request of industry, during July, for the purpose of inspection of vessels dealing with construction, equipment and sanitary requirements. These vessels were eventually to become plant extensions to land-based registered operations in the Region.

During the Summer, it was evident that large quantities of squid would be processed as a dried product for sale to countries in the Far East. This resulted in a proliferation of buyers and processors, notably, in the Notre Dame Bay and Bonavista Bay areas.

A decision was made earlier in the year that the Inspection Branch would inspect all shipments of dried squid prior to export and that registration of establishments handling dried squid would be compulsory. Competition between buyers and their agents created a quality problem in the areas mentioned, to such a degree that the Branch felt it was necessary to place a team of Inspection Officers in these areas under supervisory personnel to conduct on-the-spot surveys of production methods, as well as advising the primary producers of the importance of producing a good quality product. This program met with very good results and it appeared that producers did in fact appreciate the efforts of the Branch. It also had another effect in that fairly substantial quantities of low quality product were prevented from entering export markets. At year's end, it is estimated that close to 3,000,000 pounds of product will have been inspected and exported.

During the month of October, an educational film dealing with the harvesting, handling, processing and inspection of dried squid was produced in conjunction with the Extension Service of Memorial University. It will be made available for release in February 1980 and it, in conjunction with a slide presentation on the same subject, will be used to educate both fishermen and processors in the correct methods of producing a top quality product.

In November and early December, a team of senior Inspection Officers from Regional Headquarters drafted proposed grade standards for dried squid, as well as landed quality grades for Atlantic Coast groundfish, round herring and mackerel. These standards have been submitted for approval.

As usual, the Inspection and Technology Branch was involved in assisting other Government Departments both Federal and Provincial, Technical Institutions, the College of Fisheries, Industry and the private sectors by providing technical and practical assistance; representing the Department of Fisheries and Oceans at numerous meetings and on various committees; conducting or partaking in training seminars for industry personnel or student groups; and by providing training, both theoretical and practical, to Inspection personnel from other Regions in Canada.

Inshore Fish Handling Program - 1979 - Engineering

Basic hoist systems were installed and made operational in 150 sites by the close of the fishing season in 1979. These provided for unloading inshore boats with net bags supplied by the Branch (two per boat) and for holding and transporting fish and ice in insulated containers.

Unfortunately, 120 new electronic scales, which were to have been installed for weighing the catch as it came off the boats, were not received until October, too late to be of benefit for this season. A few of these units were installed however, and the new push-button zero feature has proven to be of considerable benefit.

During the year, a number of technical problems were solved which will make the handling system considerably more reliable and useful. For example, (1) a new insulated container, which was developed by the supplier in response to a rigid performance specification, has proven to be strong and durable. Cover hold-down straps, which were faulty when delivered, are now being replaced by better material; (2) a new mounting arrangement for the "in-line" weigh scale has made the weighing system much more reliable; (3) a new strap lifting system permits the loading and unloading of trucks with sides, (i.e. stake-body trucks), thus making the A-Frame truck loader more useful; and (4) the Branch has acquired a trailer to demonstrate this relatively low-cost solution to the provision of container transportation capacity. The capacity of a stake-body truck, for example, may be doubled by attaching an 8 x 20 ft. low bed trailer for approximately \$5,000. Some processors have purchased trailers for this purpose.

Many areas of the Province have reported greatly improved fish quality and efficiency of operations as a result of using the unloading/container system. It is especially gratifying to report that Placentia Bay area operations have proven very successful. A new fish plant, which began operations early in 1979, was designed and built as a "container" plant. Constructed on a site removed from the waterfront, all fish entering the plant is trucked in, well iced in insulated containers. Many different species have been handled in the containers, all with success. Holding room operations for this large plant are carried out very efficiently by just two men and a forklift truck.

Collection operations in five Placentia Bay communities have improved markedly. Two collector vessels deliver ice (in containers) and empty containers to each site every day, picking up the previous day's catch which has been well iced in the insulated containers and stored on the wharf. As a result, fishermen are able to fish longer and do not have to work as hard since the net bag unloading has replaced the traditional pitchfork. In addition, the operating day for the collector boat has been reduced to about 12 hours compared to the previous 18 to 20 hours. It is significant that 1979 fish landings for the five communities are double that for 1978.

By 1981, basic hoist, weighing, container handling and truck loading facilities will have been installed in 200 communities as originally proposed. In addition, a new grading system, designed for use with the container program, will be installed and tested at a number of communities. If successful, the very desirable objective of a price differential based on the quality of the landed fish will become more feasible.

A prototype fish de-icer/washer unit was tested in 1979 and will be further tested, with modifications, in 1980. With much more ice available as a result of Fish Chilling Assistance Programs in the last several years many more boats should be taking ice. Accurate weighing, and maintenance of

high quality, necessitates efficient de-icing and washing. The new unit appears to be highly effective for both these functions.

A good, clean water supply is essential for efficient wharf operations and for keeping boats and nets sanitary. It is proposed that all wharves where fish handling facilities are provided will have water supplies installed or upgraded in 1980.

Inshore Fish Handling Program - 1979 - Operations

As the capital program of installing hoist systems progressed and the production and receipt of more reliable insulated containers swung into high gear, the role of the Operations Office was much in evidence throughout 1979. Supplementary programs, cost shared with the Province, e.g. the manufacture of net bags (a basic component of the IFHP) complimented the introduction of the Program's unloading facilities.

Regulatory requirements governing the storage and transportation of fish showed considerable evidence of being met in 1979, vis-a-vis the demand for insulated containers provided to licenced fish buyers, on a rental basis, by the Program. During the year, some 4800 insulated containers were received from the manufacturer and at peak season (June-August) the demand for these exceeded the supply. Revenue from the initial year of rental (1978) reach \$92,000 and a projection for 1979 rental of insulated containers is \$385,000. Approximately one hundred fish buyers used the insulated container system in 1979.

When the capital program of nearly \$14 million is completed and the unloading systems operational, the operation and maintenance function will be funded on the basis of full cost recovery. In this regard, considerable discussion took place during the year regarding the imposition of user fees, whereby fish buyers using the onshore unloading facilities will be required to pay fees in proportion to use. Increased benefits and profits to the fishing industry from the use of the Program's facilities will offset charges by the Department.

Acceptance of the Program's goals and objectives was much in evidence in 1979 as executives in the private sector have publicly acknowledged benefits directly attributable to the Inshore Fish Handling Program. Their experience and a continued Departmental educational effort in the way of films, seminars, etc., augers well for the future of the inshore fishery and the Program's success.

Seafood Consultant

Following are highlights of activities of the Seafood Consultant for the Newfoundland Region in 1979:-

Demonstrations

Throughout the year, 24 fish cookery demonstrations were given at the Fisheries Food Centre in St. John's to consumers, students and professional food handlers.

New Product Development

Recipe testing on secondary processing for scallops, crab and squid were performed for a fish processing company and trout recipes were developed for the Provincial Department of Rural Development.

Articles

Regular articles on preparing fish and fish recipes were featured monthly for the magazines What's Happening, Decks Awash and Union Forum.

International Trade Shows

The Seafood Consultant assisted food processors in preparing fish products for buyers and food brokers in Atlanta, Georgia and New York City in February, 1979. These shows were sponsored by Industry, Trade and Commerce.

Conferences

The Seafood Consultant staffed a booth at the Canadian Dietetic Annual Conference in Halifax, Nova Scotia in June, and co-ordinated a one-day seafood symposium for the Canadian Home Economic Association held in St. John's in July.

Cookbooks

In July, the Seafood Consultant assisted the Provincial Department of Fisheries in developing a cookbook for Seafood Days promotional campaign, and also co-ordinated recipe testing for a flour company to use in their fish and seafood cookbook which is presently being published.

Food Editors

The Seafood Consultant assisted in planning and co-ordinating tours for U.S. Food Editors to Nova Scotia in June, and Canadian Food Editors to Newfoundland in August. These tours were sponsored by the North Atlantic Seafood Association (NASA).

Canadian Fish and Seafood Month

The Seafood Consultant co-ordinated and promoted programs for the Atlantic Region for the second annual Fish and Seafood Month, held in November, by planning receptions for the media, doing promotional work for radio and television, and giving fish cookery demonstrations. This campaign was very successful in making Canadian consumers more aware of the variety of fishery products available.

Radio and T.V. Shows

Throughout the year, approximately 30 radio shows were aired to encourage Canadian consumers to eat more fish and advise them of the proper handling and preparation of fish and seafood products. These shows were aired primarily in the Atlantic Region. Also, seven television shows were taped and one performed live at the Fisheries Food Centre.

General

Throughout the year, approximately 4000 requests for recipes were received from Canadian consumers in the Atlantic Provinces, most of which were as a result of Fish and Seafood Month.

On the average, three to four telephone calls are received a day in the Fisheries Food Centre for information on fish cookery.

Fish Inspection Laboratories

The Fish Inspection Laboratories provide consulting and advisory services in Microbiology, Analytical Chemistry and Quality Assurance to the Inspection and Technology Branch, other government departments and agencies, the fishing industry and private companies.

Microbiology Section

During 1979, the Microbiology Section, operating out of the Regional Laboratory in St. John's and the district laboratories in Grand Bank and Corner Brook, monitored the production of the filleting, freezing, canning and smoking plants in Newfoundland as part of its program to evaluate the bacteriological quality of fish and fish products produced in this Province. In all, a total of 27,351 bacteriological analyses were performed on 10,352 samples of fish and fish products.

The Microbiology Section monitored the bacteriological quality of existing plant water supplies and conducted both fresh and salt-water surveys to locate approved water for both proposed plant supplies and inshore fish unloading facilities. A total of 3,297 water samples were analyzed in 1979. Results were made available to other government departments and agencies, and where new water supplies were required, to the engineering consulting firms involved.

In conjunction with Agriculture Canada, the production of this province's fish meal plants was monitored during the year. Salmonella analyses were performed on 346 meal samples; none were found to contain this micro-organism.

During 1979, the Regional Laboratory was involved in the evaluation of new or improved microbiological techniques for use within the Fish Inspection Laboratories, including methodology for the enumeration of molds in fish meal, new enrichment techniques for Salmonella isolation and improved IMVIC tests. A new system for rapid identification of Enterobacteraceae, evaluated by the St. John's laboratory in 1978, was introduced in the District Laboratories this year. The Regional Laboratory was also, once again, a participant in the Laboratory Quality Assurance Program sponsored by the United States Food and Drug Administration.

The Regional Laboratory was involved in several industry-sponsored experimental projects designed to evaluate modified carbon dioxide atmosphere packaging for fresh fish and to determine the shelf-life of fresh fish in various insulated containers destined for air transport. A further service to industry was provided in 1979 with microbiological assessment of fish samples submitted by plant quality control personnel. A fee structure for

these analyses has been devised, and beginning in 1980, the Microbiology Section will charge for this service.

Chemistry

During the year, the Chemistry Section became more diversified in the type of analyses performed. Of the 44 methods used, 15 were not routinely used in the previous year.

For the Branch, a total of 2,591 analyses were performed on 523 samples. Included in these analyses were samples submitted for monitoring purposes, and complaints from the public. The type of analyses performed included: method comparison (TVBN, histamine); collaborative studies for mercury, lead, and compositional analysis; elemental composition (As, Se) on fish from Labrador and on dogfish; and a study on the cause of pink bloom on dried squid. Studies performed in collaboration with other agencies or companies included: the analysis of minced saltfish for quality indexing (Canadian Saltfish Corporation); and analysis of cooked surume (dried squid) for yield and moisture content.

During the year, the number of samples submitted by the fishing industry increased dramatically over previous years. A total of 5,759 analyses were performed on 863 samples. The majority of these analyses were performed on fish meal, fish for quality and composition, roe, and fishoils.

An additional 665 analyses were performed on 102 samples submitted by other government departments, agencies, and private companies such as: Vessel Management, Canadian Saltfish Corporation, Newfoundland Government (Department of Fisheries, Department of Health), and Memorial University of Newfoundland. Commencing in December, we will begin electrophoretic analyses on samples submitted by the Department of Consumer and Corporate Affairs.

Quality Assurance Section

The Quality Assurance Section is responsible for identifying health hazards and ensuring that the quality and labelling of domestic and imported fishery products comply to statutory requirements. The Section must also ensure uniform application of construction and equipment requirements as well as operating practices for canneries registered under the Fish Inspection Regulations. Further activities involved assessing the applicability of various codes of practice and standards of quality proposed by the Codex Alimentarius Commission as international trading standards.

During the past year, 3,646 samples were received for examination on which a total of 6,600 analyses were conducted. A breakdown of these results showed 1,932 inspections on canned and 1,714 inspections on fresh and frozen fish and shellfish samples. 308 canned products were examined for commercial sterility. Because of non-compliance, enforcement action was undertaken against seven lots of domestically produced fish resulting in one

lot voluntarily destroyed. These results also include the inspection of 17 lots of imported fish or shellfish representing a total of 52,841 pounds. Of these, two full lots representing 1501 pounds were refused entry into Canada. In addition to the analyses for quality, etc., 394 labels were evaluated for compliance to packaging and labelling regulations. Investigations were also undertaken to substantiate 12 consumer complaints involving findings of foreign matter, poor quality or suspected food poisoning. The outcome of investigations caused the removal of one product from the marketplace and the issuance of warning letters in connection with four other complaints.

The scope of the laboratory's activities were widened this year with the sampling schedule modified to accommodate the examination of fresh and frozen groundfish samples to proposed standards of the Codex Alimentarius Commission. The results of these analyses will supplement in-plant gradings conducted by Inspection Officers.

In March, a one-week workshop was offered to 21 field and laboratory personnel on canning procedures and the involvement of the Inspection Officer in regulating the canning industry. The Section continued to provide support services to the field staff as well as assistance and advice to the general public, other government departments and agencies and the fishing industry on matters related to product improvement, plant construction or operation and the interpretation of regulations.

Seafood Technology Section

The Seafood Technology Section is responsible for conducting practical (useful) research into technological problems connected with the handling, preserving, processing and packaging of marine organisms from the time of catching until they are sold to the consumer.

During 1979, we conducted or initiated research regarding:-

1. Effect of handling methods on the long-term frozen storage (-23°C, -10°F) quality of offshore (non-spawning) capelin, roughhead (caught inshore) grenadier, and roundnose grenadier.
2. The use of the Torry Fish Freshness Meter for fish caught in waters adjacent to Newfoundland.
3. Preservation of squid during the period from catching to processing.
4. Effect of handling methods on the quality of Newfoundland trap-caught cod.
5. The quality of frozen stored (glazed or vacuum-packaged) and smoked harp seal meat.
6. Handling of herring and mackerel during glut periods.
7. The salting of cod.

8. Utilization of some seafood waste.
9. The effect of subjecting live cod to oil polluted water on the sensory quality of the subsequently cooked samples

Most of these projects will be continued during 1980.

CONSERVATION AND PROTECTION BRANCH

Legislation and Training

Violations against fisheries legislation in 1979 again showed a noticeable increase compared with 1978. Up to December 12, 1979, there were 502 violations recorded under various Acts and Regulations, whereas last year, 374 violations were prosecuted. In 1979, many offences, contrary to the Newfoundland Fishery Regulations, resulted in penalties for which there were jail terms without option of fine. These convictions resulted in imprisonment for periods up to two weeks plus \$1000 fines, primarily for salmon poaching.

The chart on Page 14 is a breakdown of violations occurring within the Branch's jurisdiction for the past twelve months.

Again, in 1979, 18 Fisheries Officers attended a four-week enforcement training course at the R.C.M.P. Academy in Regina. This course was a continuation of one begun in 1978 and results, to date, indicate that the program has been most effective.

Licensing and Registration

The number of Personal Fisherman's Licences and Commercial Fishing Vessel Registrations issued has increased overall by 20 per cent for 1979 in comparison to 1978. In 1979, 8,000 new fishermen and 4,600 new vessels entered the fishery; this brings the year end total to 32,000 fishermen licenced and 19,298 vessels registered.

Other licences issued were as follows: Lobster - 4,784; Salmon - 5,511; Shrimp - 35; Snow Crab - 51; Herring, Small Mobile Fleet - 134; Large Mobile Fleet - 8; Bar Seines - 454; Otter Trawl, Under 65' - 95; Over 65' - 84; Scallop - 195.

The Licensing Renewal Program for 1980 began in November with applications being mailed to all fishermen who held Personal Fisherman's and Lobster Licences and Vessel Registrations in 1979. The salmon fishery is presently under review, therefore, renewal applications are being held pending its result. All fishermen who held other various licences in 1979 received their renewal applications for 1980 in late December. The majority of licences and registrations, for 1980, will be issued in January.

For 1980, licence plates will not be issued to Commercial Fishing Vessels under 45'. Fishermen are being advised of the requirement to display their Commercial Fishing Vessel Registration Number on each side of their vessel. Arrangements are being made to have this placed in regulations for 1980.

The Fishermen's Advisory Committee System consists of the following: Salmon Advisory Committee; Lobster Advisory Committee; Shrimp Advisory Committee; East and West Coast Herring Working Groups; Snow Crab Advisory Committee and Offshore Groundfish Advisory Committee. These committees are Management Committees for each fishery.

During 1979, considerable time has been devoted towards the review of licensing policies, primarily in line with the recommendations of the Levelton Report on Atlantic Coast Licensing.

Coastal and Inland Surveillance

Considerable effort was devoted this year to patrol of all aspects of the coastal fisheries with primary emphasis being placed upon the enforcement of salmon, lobster and licensing regulations. These patrols resulted in approximately 180 prosecutions and the subsequent forfeiture of more than 60 nets and several boats and motors.

Enforcement staff, in conjunction with coastal patrol vessels, were quite active in monitoring spring and fall herring quotas in all areas of the province. Due to an extensive build-up in fixed gear effort, field staff were required, for the first time, to monitor this aspect of the fishery to provide effective management of the resource. Other fisheries, such as crab, shrimp, mackerel, etc., were maintained to ensure proper management and compliance with existing regulations.

Patrol of the inland salmon sport fishery was prominent in 1979. During this year, a considerable number of rivers were closed for periods of time due to exceedingly low water levels. Inland fishery violations increased dramatically in 1979 and, to date, approximately 300 violations have been recorded compared to approximately 139 in 1978.

Monitoring of coastal and inland fishing activities and regulations enforcement in these fisheries is a continuing role of the federal Department of Fisheries and Oceans' Conservation and Protection Branch in the Newfoundland Region. This actively was continued in 1979, employing approximately 250 men, 12 patrol vessels and a number of helicopters and other aircraft. Mobile enforcement units, consisting of officers in plain clothes, using unmarked vehicles and boats, were also deployed throughout the province to assist in apprehending violators of the Lobster and Salmon Fisheries and the Salmon Sports Fishery in particular.

1979 PROSECUTIONS
AS OF DECEMBER 12, 1979

TYPE OF VIOLATION	NO. PERSONS PROSECUTED	NO. OF PROSECUTIONS	NO. OF CONVICTIONS	NO. OF DISMISSALS	CASES PENDING	TOTAL VIOLATIONS	MINIMUM FINE	MAXIMUM FINE
LOBSTER	56	68	55	13	10	78	\$ 10.00	\$ 700.00
SPORTS FISHERY	181	231	203	28	72	303	\$ 10.00	\$1000.00
COMMERCIAL SALMON	12	15	13	2	0	15	\$ 50.00	\$ 200.00
HERRING	3	3	2	1	0	3	\$100.00	\$ 500.00
LICENCING & REGISTRATION	48	45	35	10	8	53	\$ 1.00	\$ 300.00
CRAB	3	3	2	1	0	3	\$500.00	\$ 700.00
SEALING		3	3	-	-	3		
FISHERY ACT		30	25	5	7	37		

Offshore Management

Licensing

A total of 518 foreign vessels were licenced to operate within Canada's 200 mile economic zone during 1979. Of these, 91 vessels participated in various cooperative arrangements with Canadian partners. In addition, another 31 foreign vessels were issued special permits to operate within Canadian fisheries waters.

The Newfoundland Region issued 280 licences and 27 permits with 386 amendments being made to original licences.

During the period January 1, 1979 to September 30, 1979, a total of \$2,389,796.70 was collected as access and fishing fees from foreign vessels operating within the 200 mile zone.

Below is a breakdown of the various types of licences and permits issued by country:-

<u>Country</u>	<u>Fishing Licence</u>	<u>Support</u>	<u>Research</u>	<u>Special</u>	<u>Permits</u>
Bulgaria	6	4	-	16	-
Cuba	10	2	1	-	9
Denmark	18	-	-	-	1
Faroe Islands	16	-	-	5	-
France	15	-	2	-	-
FRG	12	2	2	-	2
GDR	9	3	1	25	2
Iceland	-	-	-	-	-
Italy	3	-	-	-	-
Japan	75	11	1	25	7
Norway	35	-	-	2	2
Others	1	-	-	5	1
Poland	13	1	-	2	-
Portugal	50	-	-	1	2
Romania	4	-	-	-	-
Spain	43	1	-	-	-
U.K.	1	-	-	-	1
U.S.A.	-	-	3	2	-
U.S.S.R.	49	27	6	8	4
	<u>356</u>	<u>51</u>	<u>16</u>	<u>91</u>	<u>31</u>

Surveillance

Offshore Management activities toward the domestic offshore fishing fleet primarily involved monitoring and enforcing the Atlantic Groundfish Management Plan. Introduced in 1977, the fishing plan controls fleet deployment and resource exploitation in Atlantic Canada's most important fishery. Observers were deployed on Canadian vessels in the Gulf and Approaches in 1979 to ensure compliance with the fishing plan. Landings of groundfish in both inshore and offshore fleets showed a significant increase over both the 1977 and 1978 landings.

Twelve charges were laid against Canadian and foreign captains during the year for various breaches of the acts and regulations governing the fishery. Of the five charges against foreign masters, three resulted in convictions and two were still pending before the courts. A total of \$6,300 was collected in fines and \$19,500 was ordered forfeited in lieu of catch taken illegally. The other seven charges were against Canadian captains. Four are still pending while two charges were dismissed by the court. The other resulted in a conviction and a fine of \$1,250, plus \$3,110 forfeited in lieu of illegally taken fish.

There were eight warnings issued to masters for minor infractions of the regulations.

Vessels from the Ministry of Transport, Department of National Defence, Bedford Institute, private charters, as well as our own patrol vessels carried out surveillance duties on Canadian and foreign trawlers during the past year. The following is a summary of the sea days credited to each Department.

DFO	403.83
MOT	13.00
DND	94.74
BIO	25.85
Charter	137.55
Total	<u>759.12</u>

Up until December 17, 1979, the Newfoundland Region had conducted a total of 601 fishing vessel inspections. Included in this total are 53 inspections conducted in conjunction with officers from the Maritimes Region and 11 inspections done jointly with inspectors from Denmark in Subarea 0 and 1. The following is a summary of the inspections by country and area.

<u>Nation</u>	<u>Inside 200 nm.</u>	<u>Outside 200 nm.</u>	<u>Port</u>	<u>Total</u>
Bulgaria	1	-	-	1
Cuba	5	9	5	19
Denmark	7	-	1	8
Faroe	5	7	7	19
France	17	1	-	18
FRG	-	-	1	1
GDR	16	-	6	22
Japan	-	1	4	5
Norway	6	-	4	10
Panama	-	1	3	4
Poland	14	-	16	30
Portugal	45	38	48	131
Romania	2	1	3	6
Spain	37	46	20	103
UK	1	-	2	3
USSR	41	18	18	77
USA	-	-	3	3
Venezuela	-	-	1	1
Foreign Total	197	122	142	461
Canada	131	9	-	140
Combined Total	328	131	142	601

Tracker aircraft flew a total of 2,123.1 hours for the Newfoundland Region of which 2,029.1 were dedicated and the remaining multitask. In addition, Argus aircraft made 52 flights mainly over the Flemish Cap, but also over the Davis Strait, Hamilton Banks, and the Tail of the Banks.

Offshore Seal Fishery

The offshore seal fishery opened on March 12, 1979, with six Canadian and four Norwegian vessels participating. Fishery Officers and Wardens were again assigned to the Canadian vessels and for the first time, officers were placed on board Norwegian vessels. Fixed wing aircraft and helicopters were again used to monitor the operation with one helicopter being placed on the CSS HUDSON which operated in the vicinity of the large vessels throughout the hunt.

Greenpeace members put in an appearance at the Front again this year, but the activities were somewhat low keyed compared to 1977 and 1978 due to weather conditions and other factors. There was one minor violation by a Greenpeace member while in the area of the hunt. His permit was cancelled immediately and he was removed from the sealing area.

Observer Program

1979 proved to be a very busy year with respect to deployment and sea day coverage by observers from the Newfoundland Region. To date the Region maintains a total of 80 trained observers with an active core of 50 individuals who are going to sea on a continuing basis. During 1979, a decision was made to have the program awarded on public tender to a third party contractor. This event should take place during the early part of the new year. After the third party contract award has been completed, it is anticipated that there will be increased activity in 1980 as emphasis is being placed on greater coverage of Canada's domestic offshore vessels.

Below is listed a summary of 1979 activity including number of trips and sea days logged - foreign domestic:-

Summary of Foreign and Domestic Observer Deployment - Newfoundland Region 1979

	Foreign	Foreign Cooperative Arrangements	Domestic Including Charters	Total
Number of Trips	174	17	53	244
Number of Sea Days	4143	514	896	5553

INDUSTRIAL DEVELOPMENT BRANCH

Groundfish Development

Development activities during 1979-80 are being directed mainly on Northern groundfish, with emphasis on cod in Areas 2J, 3KL, both in inshore and middle water fisheries.

Discussions with many fishermen (from all over the Region) as well as from their Union representatives and fish processors indicate an urgency for accelerated efforts in further development of groundfish harvesting technology to coincide with the predicted increase in cod stocks over the next few years.

The development and demonstration of modern harvesting techniques are being undertaken by working directly with inshore fishermen operating under commercial conditions. The main objectives being a) to extend the inshore fishing season through the introduction of more modern and better equipped fishing vessels, using proven techniques, and b) to improve the landed quality of groundfish made possible by better suited harvesting and on board handling technology hence the possibilities of increased prices to fishermen for higher quality production.

Development efforts are being centered around the following fishing techniques:-

- (I) Longline fishing, utilizing automated systems recently introduced to the industry, and
- (II) Mobile gear, utilizing both otter trawls and Scottish seine nets.

In the case of longline fishing, which produces a top quality product, it would appear that this method through automation, especially in the mechanical baiting of gear, has created considerable interest among fishermen using vessels ranging in size from 40 to 65 feet, the latter having the potential capability to operate in both inshore and middle water areas.

The "Mustad Autoline System", new longlining technology which was developed in Norway, where it is being operated with considerable success, is being demonstrated to fishermen in Eastern Newfoundland. This system would appear to be best suited for vessels in the 60-65' class. To further evaluate and demonstrate this equipment, a complete Mustad system was recently acquired with the hope of having it installed on a suitable vessel by March, 1980. In addition to this system, more simple and less expensive mechanized trawl baiters are being evaluated and if proven successful will be much more practical for smaller boats.

In a further effort to promote longline fishing, especially on smaller boats, engineering consultants have been engaged by the Industrial Development Branch to study the possible potential for mechanized onshore

trawl baiting. This study is nearing completion and depending on results it is hoped that a prototype system can be constructed and evaluated over the next few months. In the event that onshore mechanical baiting proves practical, then one system could provide baiting service for a number of smaller boats within a community.

In addition to the promotion of longline fishing with the aid of mechanization, efforts are also under way to promote mechanization in the use of handlines when using either baited hooks or jiggers. In this connection two automatic fishing reels have recently been acquired which in effect fully mechanizes the operation of handlines for cod fishing.

This equipment which was manufactured in Norway, where it is widely used by small boat fishermen, is presently being evaluated by an inshore fishing crew in Eastern Newfoundland.

With reference to the use of mobile gear (otter trawls and Scottish Seine nets) for groundfishing, considerable work has already been undertaken but much more needs to be done in order to evaluate its possible potential in inshore and middle water areas off Eastern Newfoundland and Labrador.

An interesting experimental fishing project undertaken jointly by the Provincial Department of Fisheries and the Industrial Development Branch, Department of Fisheries and Oceans, during the past Summer, which involved the operation of two 80' fishing vessels from Scotland, provided considerable information relative to the possible development of a middle water fishery. Although actual fish landings were not impressive, mainly due to the lack of fish on the grounds at that time, valuable information relative to vessel size, deck equipment and fishing gear, together with a detailed survey of middle distance grounds in Areas 2J, 3KL will be most helpful in future development.

An experiment involving the operation of smaller vessels (40' - 45') in pairs, utilizing their combined horsepower for pair bottom trawling and/or pair seining is about to commence with work to continue over the next few months.

It is hoped that present efforts in groundfish development will result in the development of fishing technology which will be adaptable to many of the existing vessels which are presently heavily involved in the use of gillnets for groundfish. This gillnet fishery is causing considerable concern within the industry, both from the quality problem as well as that of conservation. However, fishermen are very conscious of the concern over gillnetting for groundfish and appear to be most interested in alternate fishing methods that would produce equivalent catch levels.

Shrimp Development

The shrimp fishery in Newfoundland which has been ongoing for the past ten years, using vessels in the 50-65' class, has been confined to a small area in the Northern Gulf of St. Lawrence north of 50° North Latitude. In the meantime, and especially over the past couple of years, considerable interest has developed regarding the possible potential for expanding this fishery further south along the West Coast of Newfoundland.

A short experimental shrimp fishing program carried out during September and October in an area off Bonne Bay and Bay of Islands indicated that some potential does exist for a commercial shrimp fishery in this area. Results of a preliminary survey over a large area between Latitude 49° North and 50° N in depths in excess of 100 fathoms, indicate an area of suitable trawling ground similar to that supporting the existing shrimp fishery referred to above. Catch rates were also similar to those in the existing fishery.

It should however be noted that the potential fishing grounds in this area are much farther offshore, in excess of 50 miles, and may require vessels of 65' and over for a viable operation. Further work is required in this area at different periods of the fishing season to confirm catch rates.

A continuation of this exploratory fishing program is planned with a view to determining what possible potential might exist for a commercial shrimp fishery in both St. Mary's and Trinity Bays. It is expected that some work can be undertaken in the latter areas during the Winter and early Spring using vessels of 55 and 65 feet.

Additional development projects in which the Branch participated during 1979 are:-

- mesh size selectivity in cod traps, in conjunction with Research and Resource Management;
- development of prototype scallop shucking equipment for Icelandic type scallops;
- mussel culture in Placentia Bay, undertaken by Marine Sciences Research Laboratory, Memorial University;
- development of new design saltfish dryers in cooperation with Canadian Saltfish Corporation.

NEWFOUNDLAND BAIT PROGRAM

Sales of bait to fishermen engaged in the inshore line fishery, lobster and crab fishery amounted to approximately 6.5 million pounds in 1979. This is an increase of one million pounds over 1978 as the demand continues to increase.

Squid, which is the preferred bait for the cod and crab fisheries, was again available in abundance and there was no difficulty in securing the required supplies as bait depots continued to freeze stocks until the end of the season.

Herring bait for the lobster fishery, was in short supply at the beginning of the season and mackerel was obtained to supplement requirements. Herring is in great demand for the food market and each season is more difficult to acquire for bait purposes. It is anticipated, therefore, that more mackerel will be used for lobster bait in the future.

Mackerel, which has proven to be an acceptable bait for the cod, lobster and crab fisheries, continues to be regarded as an adequate substitute for squid and herring, and supplies are acquired only in the event of a shortage of these other species.

Caplin is not in great demand for bait purposes and only minimal stocks are frozen for this purpose.

The Bait Program operated 42 bait depots and bait holding units throughout the Province in 1979.

Bait Program technicians were busily engaged in the maintenance of equipment and facilities to ensure continuation of services.

FISHERMEN'S ASSISTANCE PLANS

Vessel Insurance Coverage

During the period under review a total of 730 new policies were written, representing a total insured value of \$19,382,663.

During the same period, 768 renewal policies were issued with a total insured value of \$15,668,475, making a grand total of 1,498 policies, with a total insured value of \$35,051,138.

Vessel Claims

During the period, 24 total loss claims were paid, with indemnity payments amounting to \$616,727. A total of 20 partial loss claims were paid amounting to \$69,667 making a total of 44 claims and total payments of \$686,394.

Approximately 24 claims remain to be processed when the necessary repairs have been effected and some reports and investigations completed.

Subsidy Program

During the year, the following list of fishing vessels were constructed and launched:-

<u>No.</u>	<u>Length</u>	<u>Construction Cost</u>
3	30'	\$ 34,000
5	31'	91,950
11	32'	222,450
6	33'	148,250
4	34'	70,000
24	35'	589,164
8	36'	256,500

<u>cont'd</u>	<u>No.</u>	<u>Length</u>	<u>Construction Cost</u>
	1	37'	\$ 35,000
	8	38'	319,000
	1	39'	37,000
	3	40'	163,000
	1	42'	57,500
	11	45'	699,900
	1	50'	220,000
	1	52'6"	196,000
	1	55'	380,000
<u>TOTAL</u>	<u>89</u>		<u>TOTAL . . . \$3,519,714</u>

For the current fiscal year, to date a total of 81 applications have been approved for new construction with an estimated construction cost of approximately \$9,697,352.

RESEARCH AND RESOURCE SERVICES

Programs in Research and Resource Services are aimed at providing the scientific information necessary for effective management and use of the freshwater and marine resources within the Canadian Atlantic area in general and the Newfoundland area in particular.

Major emphasis is placed on research associated with the management of our fisheries and about 77% of our total budget and 79% of our manpower resources are devoted to stock assessment and associated biological research. Salmon enhancement projects form the next most significant part of our program with lesser resources devoted to habitat protection and a small fish disease research program.

Marine Fisheries Management - Groundfish

Fifteen cruises with large research vessels were conducted during 1979; 11 cruises to measure changes in abundance of the various resources and collect auxiliary biological data, one to tag cod and Greenland halibut, one to conduct comparative fishing between Gadus Atlantica and A.T. Cameron, one to conduct mesh selection experiment for roundnose grenadier, and one food and feeding study in Division 3L. Again in 1979 several cruises were made to the areas of ICNAF Division 2GH and 2J-3K with the Gadus Atlantica. In addition to the above one cruise on the MV Shamook investigated the feasibility of tagging Greenland halibut and witch with a smaller trawler. A charter of the Beothic Venture conducted research on the small redfish-shrimp problem in the Gulf of St. Lawrence, a charter of the Zagreb conducted a plaice mesh selection study in Division 3L and a trip of the Marinus tagged cod in Division 3L. From these cruises much useful data on distribution, life history and abundance changes, etc., for the major commercial species were collected and will be used in the assessment of the annual and long-term potential of the resources in the areas studied. Biological samples were also collected from commercial fish landings at selected Newfoundland

ports and studies of fish discards in Canadian fisheries were expanded in 1978.

Stock assessments were presented to the ICNAF Annual Meeting in June on those stocks for which Canada had requested advice from ICNAF. These were: four cod stocks, two redfish stocks, six flatfish stocks and one roundnose grenadier stock; the remaining stocks in the Newfoundland-Labrador area were assessed by the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC). These assessments formed the basis of catch quota regulations and in turn effort regulations for the different stocks in the Newfoundland-Labrador area. In addition directed studies continued on cod food and feeding, cod migrations, redfish stock discrimination, groundfish population mechanisms and juvenile flatfish abundance and distribution.

Marine Fisheries Management - Pelagic, Shellfish and Marine Mammals

Herring

The general decline in herring abundance along the Newfoundland Coast in recent years continued in 1979. This decline can primarily be attributed to the poor production of young herring since 1969. However, reports of an abundance of small herring from several areas along the Northeast and Northwest coasts may indicate an improving situation. If the situation is improving it would still take several years before these fish will have grown sufficiently to make a significant contribution to the fishery.

In addition to tagging studies and the collection of biological data from the fishery, a program has been initiated to study the early life of herring. These studies should provide information on the factors which cause poor and good year-classes of herring.

In spite of a declining herring resource, catches remained close to the 1978 level due to increased fixed gear catches along the North, East, and West coasts.

Capelin

Results from acoustic surveys in 1978 and from analytical models (sequential capelin abundance models) were used to monitor the capelin stocks. These analyses revealed that the biomass of capelin was declining due to poor recruitment in the population. As a result, fisheries managers reduced the Total Allowable Catch of capelin in 1979.

There were two major acoustic surveys in 1979, one to the Southern Grand Banks and Southeast Shoal in June and the second to ICNAF Division 3K2J in October-November. A new microprocessor based acoustic system was successfully tested in the latter trip. Software development for the acoustic system continued in 1979. The new underwater camera was successfully deployed during the June trip and data from these pictures will complement the acoustic data.

One stock discrimination study was completed and the results agreed with the present delineation of capelin stocks. The collection of biological samples continued in 1979.

Mackerel

The Northwest Atlantic mackerel stock appears to be recovering from the low population levels observed in the mid-1970's. With the elimination of the international mackerel fishery on the overwintering grounds off New England the total catch has declined. However, the Canadian catch from the Newfoundland and Maritime coastal fishery has been increasing such that Canada now takes the majority of the catch.

The 1978 year-class appears to be strong, however, its affect on mackerel abundance in the Newfoundland area is unpredictable due to the influence of water conditions upon the seasonal availability of mackerel in the Newfoundland area.

Biological monitoring of the Newfoundland mackerel fishery continued in 1979.

Lobster

Monitoring of the fishery in five study areas around Newfoundland for size and sex composition of the landings and CPUE was continued. Tags applied in 1978 and earlier years in these areas were collected from fishermen throughout the fishing season. These tagging studies provide information on growth and movements of lobsters and also enables estimates to be made of standing stock, recruitment, exploitation rate and annual growth.

Field studies of larval ecology were continued at Arnold's Cove during the Summer and additional tagging of commercial lobsters and shell condition sampling of catches was carried out in all five areas during the Fall.

Crustacean Population Dynamics

The small area around the Shag Rocks in Long Harbour, Placentia Bay remained closed to commercial lobster fishing and a tag-recapture study of lobsters continued there for the fourth year. This study is providing a basis for estimating various lobster population parameters and for evaluating the impact of commercial fishing on these parameters.

Shrimp

Review of trends in catch and effort, biomass and stock composition in the three Labrador Channels provided the basis for shrimp stock assessment and the establishment of the 1979 T.A.C's. Catch levels of 3200, 1700 and 800 metric tons were set for the Hopedale, Hawke and Cartwright Channels, respectively. Two research cruises were conducted in these areas in 1979.

The first coincided with the beginning of the fishing season and the second, although limited in success due to poor weather, took place after the Hopedale and Cartwright Channels had been closed to fishing. The observer programme initiated in 1978 to closely monitor this fishery was continued in 1979.

A research cruise to the Esquiman Channel (Gulf of St. Lawrence) in May provided data on shrimp distribution, biomass and diel variability. The commercial fleet in Port au Choix was continued in 1979.

Shrimp research in the Davis Strait centered around observers' reports from the commercial fishery and a research survey in September. The survey supplied an estimate of biomass and information on shrimp distribution in the area. It was estimated that at the time of the survey roughly 25% of the calculated biomass was located west of the international boundary.

Crab

A tagging program was initiated this year. Data obtained with the return of these tags will be used to determine the movements of snow crab, as well as the numbers of animals available to the commercial fishery.

Crab plants were visited on a regular basis and sampling carried out to determine the size distribution and shell condition of the landings. In addition, staff accompanied fishermen to the crab grounds in order to sample catches before culling.

Squid

A joint cruise with the USSR during late April found very young squid (*Illex*) in the oceanic area south and east of the Grand Banks for the first time.

During a bottom-trawl survey for squid in June on St. Pierre Bank and along the southern part of the Grand Banks, catch rates were high and high abundance of squid inshore later in the season was forecast.

Biological samples and data on catch per unit effort were obtained at five inshore localities throughout the season and at one locality (Holyrood), environmental conditions (i.e. water temperature, wind, cloud cover, etc.) were monitored.

No returns have been obtained to date from over 3000 squid tagged offshore in June, but returns from over 13,000 squid tagged inshore later in the season demonstrated extensive movements in the inshore area.

Considerable progress was made in refining the technique for observing growth rings in squid statoliths.

The area up to 200 miles offshore from the coast of Southern Labrador and Northeastern Newfoundland was surveyed for Arctic squid (*Gonatus*) during November, but catches were quite small.

Scallops

The third and final year of a three-year agreement to investigate aspects of scallop culture between the Research and Resource Services Directorate and the Provincial Department of Fisheries was concluded in 1979. Economic evaluation of scallop culture was completed. Both bottom (ranching) and cage-culture routes were examined. Varying levels of spatfall, mortality, harvesting and price options were used in the study. The simulation approach using somewhat conservative assumptions gave annualized rates of return of between 26 and 37% for the bottom culture route. Cage culture of scallops is heavily labor intensive and as expected, showed negative rates of return unless unrealistically high prices are assumed.

A random-stratified survey to determine the distribution and abundance of scallops on St. Pierre Bank was conducted during the Summer.

Seals

In March 1979, 2,884 harp seal pups were tagged off the coast of Southern Labrador. The results of this mark-recapture experiment indicate a production of approximately 220,000 pups on the Front. Total production of the Northwest Atlantic Harp Seal population is estimated at 350,000 pups. Also in 1979, studies were initiated to study the seasonal diet of harp seals and growth rates.

Based on present information, the size of the Northwest Atlantic Harp Seal population is estimated to be 1.4 million 1+ animals with a pup production of 350,000. The sustainable yield is estimated to be 237,000, assuming a pup: 1+ ratio of 80:20 in the catch. The most recent analysis suggests that the population may be slowly increasing under the current levels of catch.

Research was also conducted on hooded seals in 1979. A large biological sample of female reproductive organs was collected to allow an estimation of age of sexual maturity and pregnancy rate. This important information will be used in the coming year to reassess the status of the Newfoundland population.

Whales

Concentrations of foraging humpback and finback whales off the coast of Newfoundland were censused by aircraft and vessel from mid-June to early September, and preliminary analyses of the data suggest that each species numbers several hundreds in inshore waters. No resightings of humpback, finback, and minke whales with visible streamer tags have been reported.

Biological data and specimens were obtained from stranded and net-entangled whales. Measurements, specimens, and biological data were obtained from 130 pilot whales which stranded in a shallow bay near Point au Gaul, Burin Peninsula. The proximate cause of the stranding is not known, but it is likely that the whales became confused and disoriented

after they entered this very shallow cove which is protected from the open sea by several small islands.

Many whales became entangled in fixed, inshore fishing gear during the summer. Jon Lien of Memorial University of Newfoundland is undertaking a DFO-sponsored study of the nature and magnitude of the entanglement problem, including the experimental development of acoustic, visual, and other alarms to protect fishing gear from large whales. Some success was apparently achieved in the protection of codtraps with low-frequency underwater "bells" but no effective method of protection of groundfish gill nets was developed.

Freshwater and Anadromous Fisheries Management

Atlantic Salmon

Atlantic salmon biologists have assisted the International Commission for the Exploration of the Sea in its re-examination of the Greenland salmon fishery in the light of new knowledge gained since 1974. Canadian biologists have played a major role in demonstrating that the earlier assessment was inadequate and that the West Greenland salmon fishery may have a greater impact on certain salmon stocks than had previously been suspected. Efforts are now underway to establish more accurate analyses of the fishery and its impacts on Canadian salmon fisheries and stocks.

The late start-up of the commercial fishery and the low salmon catches experienced in 1979 (less than 1000 metric tons, as compared with 1200 in 1978, and about 2000 in recent years) was primarily attributed to an abnormally high marine mortality among those juvenile salmon which entered the sea in 1977, although the exact cause could not be identified. Restricted fisheries continued on those stocks of salmon with poor runs, primarily west coast stocks.

The salmon angling catch was about 36,500 fish which was above the 1978 catch but below the previous three years. The catch was affected by many river closures (because of low water levels), low angling effort, and a reduced catch of those large salmon which had left the rivers in 1977.

In 1979, Atlantic salmon managers, economists, and biologists reached a milestone with the completion of a Task Force report on Atlantic salmon management practices and directions. This was followed by the development of a draft Blueprint for the Future of Atlantic Salmon.

Arctic Char

Arctic char catches were good in 1979; they totalled about 213 metric tons which, although being lower than last year (248 tonnes), was about the same as in 1977 and 1976 (210 and 215 tonnes respectively). These catches were realized despite the imposition of new restrictive quotas on several char stocks in the Nain area of Labrador.

Resident Species

Surveys on the commercial fishing potential of whitefish and lake trout in the Smallwood Reservoir in Labrador were concluded in 1979 and the data are currently being analyzed. Meanwhile, on the island, unusually large brook (mud) trout were caught in an experimental lake into which smelt had been introduced as a food fish in 1975.

Habitat Protection

A highlight of activities during the year was the successful movement of habitat management effort into the marine offshore area. For the first time, and through joint efforts with Maritimes Region counterparts, there is a confidence that Department of Fisheries and Oceans is coming to grips with the risks imposed upon fish and fisheries by hydrocarbon exploration and possible production.

Also day to day habitat protection activity has continued as has an ongoing project to determine the long term impact of forest spraying on our freshwater fish populations.

Experimental Ecology Program

Through association of a group of specialists, this program provides: (a) an interdisciplinary venue for studies of the effects of natural or manmade contaminants in the aquatic environment on the genetics, physiology and biology of marine organisms; (b) an approach toward understanding the effects on marine ecosystems of changes in physical, chemical and biological factors, including the interaction among species, predator-prey relationships, competition for food and space, and fisheries exploitation; (c) the use of population genetics, statistics and computer technology in the separation of stocks of marine species employing morphometric and growth variations; (d) studies on the structure of certain antigens produced by disease-producing species of bacteria which affect salmonids; (e) provides acoustic fish-counting and integrating services to other programs; (f) provides routine services to other Programs, namely oceanographic measurements, drafting, photography, tag return coordination, specimen curation, and record keeping; (g) statistical services ranging from the provision of computer time to sophisticated statistical analysis and experimental design.

Physiological Ecology

Improvements have been made in the technology of aryl hydrocarbon hydroxylase measurement in fish, an important index of exposure to oil pollution. A significant advance has been the replacement of the highly carcinogenic substrate of the assay with a safe one.

As recently as two years ago, it was believed that oil pollution was unlikely to have any serious effects on adult fish. Further investigations into the long-term effects of low concentrations of oil have revealed debilitation and delayed death in scallops, and lessened feeding activity in three species of finfish which can ultimately end in death. Neither of these effects would be detected by standard 96-hour toxicity tests.

Mutagenic agents have been detected in coking plant effluents, used engine oils, and chlorinated organic materials of all kinds, including sewage and fish plant effluents.

A brief investigation of oil contamination from the KURDISTAN wreck indicated that its toxicity to marine life is likely to be very slight.

Fisheries Ecosystems

This Section is an amalgamation of the former Multispecies and Biological Oceanography Sections; this was a result of the natural evolution of their research efforts, bringing their functions closer together. The new Section serves as a focus for ecosystem-level research that integrates population biology with physical and chemical environmental factors. The two major projects are concerned with (a) the dependence of cod on the availability of capelin and the concomitant impact of fluctuations of cod on capelin stocks, and (b) a study of larval production and survival in an ecosystem (the Flemish Cap) which is isolated by circumstances of its hydrography.

Early indications have been (a) that cod are not critically dependent on capelin as a food item, and (b) that no particular stage of larval development appears to be 'critical' to survival. These projects are scheduled to continue for several more years.

This Section continues to provide routine oceanographic services to Research and Resource Services and the scientific oceanography community in general. Steps are being taken to streamline the flow of data into the MEDS database. New instrumentation for oceanographic measurement is also under development, such as continuous surface sampling by ships under way.

Microbial Chemistry

Chemical analysis of the toxic products of a series of fish pathogens has revealed a correlation within a pathogen group (*Aeromonas hydrophila*) between antigen structure and pathogenicity. Further analysis of these endotoxins is continuing in collaboration with the Max-Planck Institute in Freiburg, F.R.G. Similar work has demonstrated a difference between the fish-pathogenic *Vibrio* strains found on the West and East coasts of Canada.

The mandate to establish a fish disease diagnostic group did not materialize due to scarcity of (human) resources, but five attempted diagnoses were performed in response to urgent situations.

Electronic Development

The design and testing of a second-generation acoustic integration and data acquisition system has continued this year. Sea trials conducted in October were successful; another year of development is projected before the system is complete.

Reorganization within the Section resulted in the reassignment of one individual to microprocessor development and another to instrument design, maintenance and repair. The rapidly increasing technical capacity of this Section has, however, been matched by increasing demands for development and repair projects of all types.

Statistics and Computing Services

This Section continues to provide computer services to Research and Resource Services. There has been a steady progression towards interactive programming with its inevitable increase in efficiency.

High-level statistical advice has been provided to several projects in Research and Resource Services in the form of full collaboration at the research level. In most cases, this has entailed the creation of new statistical methodology to suit special types of data (e.g. data that do not satisfy the assumptions involved in usual multivariate and other types of analysis). This approach has greatly enhanced the scientific credibility of some of the work done by other groups with the Directorate.

Biochemical Systematics

This Section has devoted a significant amount of time reviewing the validity of the biochemical methods of stock discrimination. Much of the work being done throughout the world in biochemical systematics is suspect to some degree. Criteria developed from this review were used in screening potential projects, so that the scientific output would be accordingly more credible.

One of the projects selected has been the discrimination of 3KL witch from 3N0. The other major project has been the discrimination of turbot from 2G-J and 3K-Pn. Both of these projects are ongoing, and results are still preliminary.

Technical Services

This group provides services to the Directorate in drafting, photography, research vessel scheduling, and tag returns. Specialized expertise available within this Section has been employed in easing the transition to the new Center. Management of the seawater system, animal care facilities and fermentor operations will become part of the duties for this Section in 1980.

REGIONAL LIBRARY

The Regional Library supports all Programs and Branches of the Department of Fisheries and Oceans, Newfoundland Region, as well as the Environmental Protection Service, Newfoundland Region, by making available to their staff information contained in relevant literature which covers a variety of subjects and is written in several languages. The increased usage of the library's services by DFO and EPS staff during 1979 is indicated by the approximate doubling in the number of monographs received, microfiche received, items loaned and items shelved from the 1978 figures.

The Regional Library also serves members of the general public, on demand, by retrieving material either available for use within the library or for short-term loan. The number of outside users has grown appreciably since the library's move into the Centre. There are now 124 individuals registered who have signed out material within the last two years. As many again have consulted items in the library. This clientele includes mainly provincial and federal government employees, consultants, and University and College of Fisheries faculty and students.

The library staff remained at 3.8 M/Y plus two term M/Y during 1979. Due to budgetary restraint, the number of new monographs purchased were restricted, three subscriptions cancelled, and the emphasis placed on acquiring relevant non-cost material such as government and consultant reports. There are now almost 5,500 monographs in the collection. The recataloguing project continued in 1979 and 1,363 monographs now can be accessed by either author, title, subject, series or Library of Congress class number.

The library pays for 225 serial subscriptions, and Branches pay for 175; however, issues for approximately 400 other titles are received free, so in total the library received 644 serial issues a month during 1979. The serials in the Inspection reading room were moved to the library in June 1979, hence there is now only one reading room at Microbial Chemistry which will be amalgamated with the Regional Library in 1980. A serial inventory was continued in 1979 and holdings for 1,207 verified titles were submitted to a National Union list that other libraries use for inter-library loans. During 1979 the library continued to place a high priority on interlibrary loans for items not in the library. To the end of November 3,942 requests were processed.

Prior to 1979 some staff publications were indexed in the card catalogue. All departmental staff were surveyed in 1979 and 712 additional index cards made, which completed the two-year project. This index is now being updated on a weekly basis and reprints are added to the non-circulating archives collection when a copy is given to the library. Also to assist in the retrieval of periodical articles or reports on a subject, seven ongoing computer literature searches were established in 1979 and 66 retrospective searches were completed to the end of October.

In 1979 arrangements were made within the Public Library to circulate 100 books to the A.T. CAMERON and CAPE ROGER and 50 books to the CAPE HARRISON and NONIA (now out of service) for a two-month loan, so that the crew would have some recreational reading.

It is anticipated that demands placed on the library will increase during 1980 following the move of more Department of Fisheries and Oceans staff into the Centre.

SMALL CRAFT HARBOURS BRANCH

Construction Program

During 1979 the budget allocated to the Newfoundland Region was set at \$5.5 million broken down into \$3.3 million for capital works and \$2.2 million for operations and maintenance projects. Over the year 55 projects were carried out on behalf of this Branch by the staff of the Department of Public Works of Canada. In addition 225 emergency and minor repair projects of an individual value of less than \$5,000, totalling \$477,900, were undertaken directly under the supervision of the Small Craft Harbours Branch staff.

Some of the larger projects carried out during 1979 were:-

<u>Place</u>	<u>Project</u>	<u>Value</u>
Branch	Dredging	\$235,000
Burnt Island	Wharf Extension	169,000
Greenspond	Smoke House Wharf Extension	119,000
Harbour LeCou	Breakwater Reconstruction	212,000
Long Cove	Harbour Development (Phase I)	130,000
New Bonaventure	Wharf Extension	146,000
Triton	Fish Plant Wharf (Cost-Shared)	364,000
Bailey's Cove	Wharf Reconstruction	130,000
Bird Cove	Wharf Repairs	115,000
Cape Broyle	Community Stage Wharf Repairs	159,000
Daniel's Point	Slipway Repairs and Extension	135,000
Portugal Cove South	Wharf Repairs	192,000

Although the majority of these projects were carried out during the 1979 construction season, it should be noted that some were started in 1978 and completed this year, while others will not be completed until early 1980.

Included in the Branch budget of \$5.5 million was \$500,000 contributed to the Canada Works Program. Later in the year a further \$960,000 was budgeted for the last phase of the Canada Works Program. The Branch's involvement in the marine projects under the Canada Works Program consisted of technical advice and the purchase of construction materials and services which could not be funded under the Canada Works Program.

Five-Year Program

During 1979 work commenced on a study to determine the required level of funding for the Branch's operation over the next five years.

This study, being undertaken by a private consultant firm in conjunction with available departmental resources, will also outline the level of services required and the location for future development. Similar studies were undertaken at all Regional Small Craft Harbours Branch offices in Canada.

Property Management

On September 20, 1979, approval was granted by Order in Council PC 1979-2522 transferring the administration, from the Ministry of Transport to the Department of Fisheries and Oceans, of marine facilities in an additional 17 locations in this Region. The Branch now administers within the Region marine facilities in 552 harbours and certain separate facilities in an additional 36 harbours. The total facilities number 900 including wharves, breakwaters, sheds, slipways, haulup engines and various miscellaneous structures.

The Branch is also responsible for the administration of approximately 100 leases and licences issued to private companies and individuals for their use of Government property.

SUPPORT SERVICES

Vessel Management Branch

During 1979 a number of changes occurred within the Vessel Management Branch. During the Summer, a double crewing regime was put in place for the patrol vessels "Cape Roger" and "Cape Harrison". Operations on the Labrador Coast were conducted by three inshore patrol vessels during the past year and to all reports these vessels operated satisfactorily. Four vessels were involved in Search and Rescue with the "Gander Bay" continuing for eight months of the year. The "Goose Bay" originally was planned for 12 months of the year but was cancelled during the Fall and the "Cape Harrison" and the "Arctica" were involved in replacement of the "CCGS Grenfell" from August 1 until October 1, 1979.

Major problems occurred with the "Cape Harrison's" main propulsion system involving a gear box failure on August 15. Repairs took two months. Other maintenance occurred with the "Cape Roger" involving the heating system and repairs for a collision December 8 when the vessel was struck by the ferry "Green Bay Transport I". These significantly reduced sea days for these vessels.

As a consequence of the double crewing regime, the "Arctica" and "Nonia" are being removed from service. It is anticipated that the "Nonia" will be returned to the Department of Transport while the "Arctica" is currently tied up at Long Harbour awaiting disposition. From the scientific side, most vessels operated fairly well during the year although the "A.T. Cameron" was delayed on refit and the smaller vessels experienced major hydraulic problems.

Fisheries... our future

