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1979 Annual Report

Maritimes Region

Information Branch

FISHERIES AND OCEANS

1979 ANNUAL REPORT

MARITIMES REGION

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DEPARTMENTAL SUMMARY

OF

FISHERIES & OCEANS

1979 saw numerous structural and personnel changes within the Department. With the Progressive Conservative victory last May, the Department of Fisheries and Oceans acquired a new federal Minister. James McGrath (MP from Newfoundland) succeeded former Liberal Minister, Roméo LeBlanc.

Mr. McGrath found himself Minister of a newly organized Department. In 1979, the Department of Fisheries and Environment was officially split to form the Department of Fisheries and Oceans and the Department of Environment. This reorganization required the division of personnel history records, files and paylists, between the two newly formed Departments.

At the Regional Management level, Richard A. Crouter left his post as former Director-General for Fishing Operations - Pacific and Freshwater Fisheries, and came to the east coast from British Columbia to become the new Director-General of Fisheries Management, Maritimes Region. He was appointed in July, and officially assumed his duties in early September, 1979. Mr. Crouter replaced H. Douglas Johnston who left the position to accept a new assignment in Ottawa.

D. A. "Sandy" MacLean moved from Fisheries and Oceans to the Nova Scotia Provincial Department of Fisheries where he now holds the position of Deputy Minister. M. C. Cormier is presently acting for Mr. MacLean in his former position as Director of the Program Planning and Co-ordination Branch.

The Fisheries Development Branch, which incorporates, in part, the former Technology Branch, saw Tom Hayes replace Dr. Graham Bligh as its Director. Dr. Bligh has been participating since September, 1979, in a two-year executive exchange loan program to the Nova Scotia Technical College in Halifax. Dr. Bligh, along with fellow federal researchers, Dr. Robert Ackman and Dr. Thomas Gill, is helping that institution establish a fisheries research and technological centre in Halifax.

Wayne Shinners left his position as Director of Field Services Branch this past year in order to transfer to the same position in Vancouver, British Columbia. Replacing him is Pierre Comeau, who has headed up that Branch in the past. Jack Creeper who was the Assistant Director of the same Branch took his retirement this past year after a 13-year career with the Department.

Dr. James Stewart, formerly Head of the Disease and Nutrition Unit of the Fisheries and Environmental Sciences Division at the Halifax Laboratory, replaced Dr. Barry S. Muir as Director of the Resource Branch. Dr. Muir vacated the position here to assume the role of Director-General, Resource Services Directorate, Fisheries Management in Ottawa.

April of 1979 also saw Neil Bellefontaine replace Wayne Shinners as Area Manager for the Central Nova Scotia area. Jim Melanson became the new Area Manager for the Southern New Brunswick area, and subsequently transferred to Southwest Nova Scotia as Manager of that area.

FISHERIES NEWS - 1979 IN REVIEW

$20 MILLION ALLOCATED FOR FISHERIES RESEARCH TRAWLERS

In early March of 1979, then Liberal Fisheries Minister, Roméo LeBlanc announced the signing of a two-year contract with Ferguson Industries Ltd. of Pictou, N.S., for the construction of two 49.5 m (165 ft.) stern trawlers at a cost of $10 million each. One of the trawlers will conduct research from George's Bank to the northern waters off Labrador, while the other will replace the 20-year old A. T. Cameron, which conducts fisheries research out of St. John's, Newfoundland.

SURVEILLANCE VESSEL CYGNUS TO BE REPLACED

In November, it was announced by the Department that the 20-year old surveillance vessel, Cygnus would be replaced by a new, 60-meter (197 ft.) vessel to be constructed at the Marystown shipyard in Newfoundland at an approximate cost of $13 million. The new Cygnus will be based in Halifax, and will be used to patrol Canada's 200-mile Fisheries Management Zone.

CHANGE IN EASTERN SHORE LOBSTER DISTRICT

Following a series of meetings with District #5 lobster fishermen to determine their preference on measures to improve the declining lobster fishery of that area, the majority recommended that district #5, which then extended from Cole Harbour, Halifax County, to Ragged Pt., Guysborough County, be split at Mitchell Bay, Guysborough County, into two distinct districts: 5 and 5A. In each district, the lobster fishing season was shortened by twenty days so that it now runs from April 20th to June 20th. In the future, such a district split will allow flexibility in varying either of these seasons, should weather and ice conditions dictate.

GAFFKENIA RESULTS IN HIGH LOBSTER LOSSES

In July of 1979, outbreaks of gaffkemia, compounded by poor storage conditions, incurred lobster losses of up to 96% in several areas of Shelburne County, N. S. Gaffkemia is a blood disease which is fatal to lobsters, but harmless to humans. Subsequent to reports of the outbreaks, the Department of Fisheries and Oceans issued a press release describing the nature of the disease and the recommended steps to be taken to avoid further infection of landed lobsters.

SALMON GENETICS RESEARCH

The second phase of the long-term Salmon Genetics Research Programme began at the St. Andrew's Biological Station in early April. The object of the programme is to determine the hereditability of various traits such as size and age at sexual maturity, growth rate and migration behaviour. As well, surveys conducted of many of the salmon rivers of Atlantic Canada will provide the best existing stocks for Regional Management and aquaculture activities.

ATLANTIC SALMON REVIEW

April also saw the completion and release of a 27-page draft report prepared by a Departmental task force and entitled, "The Atlantic Salmon Review". The report describes major resource problems, and recommends Salmon management changes which will increase the total benefits from this valuable renewable fishery.

After the report was released publicly, region-wide public meetings were held in early May in order to provide for the feedback and comments of those interested in the Atlantic Salmon fishery.

POISONOUS SHELLFISH CLOSE SHELLFISH AREAS

From mid-July until the end of September several areas in the Maritimes had to be closed to the taking of shellfish following an increase in the dangerous toxin levels present in clams and mussels. Paralytic Shellfish Poisoning (P.S.P.) results from the eating of shellfish which have been feeding on the planktonic marine dinoflagellate named Gonyaulax Tamarensis. In addition to the Annapolis Basin, all of the Bay of Fundy and areas of Charlotte County, N. B. had to be closed to shellfish harvesting for varying periods of time during the summer.

COMMERCIAL SWORDFISHERY REOPENED

Effective July 27th, the Canadian commercial swordfishery reopened after its closure in 1971. Swordfish licenses were made available to all vessel owners operating a licensed vessel capable of fishing for swordfish. The fishery had been closed initially because it was felt the level of mercury in the fish, at over 0.5 ppm, constituted a health hazard to consumers. It was decided this year to lift the mercury guideline in favour of providing information to consumers on safe consumption rates.

A swordfish catch quota of 1,500 metric tons was initially set for the remainder of 1979, but when the Department realized that Canadians were selling swordfish illegally "over the side" to the Americans, the quota was raised to 3,000 metric tons with the provision that consideration would be given to foreign requests for licenses to enter Canadian waters to purchase swordfish.

RESTRICTIONS EASED ON TUNA LICENSING

Subsequent to the completion of a Tuna licensing study in mid-July, Fisheries Minister James McGrath announced in early September the details of a new Tuna Management Policy for the Atlantic area for the balance of 1979. Licensing restrictions

were eased so that Tuna fishing by rod and reel only was opened to all bona fide commercial fisherman (i.e. those eligible to hold class "A" lobster licenses), and to existing licensed non-bona fide fisherman on a non transferable basis. A catch limit of two tuna per boat per day was set along with number of fish quotas of:

800 St. Margaret's Bay traps;
1200 the Gulf of St. Lawrence;
200 Atlantic Coast and
Newfoundland.

TECH. COLLEGE ESTABLISHES RESEARCH LAB.

In mid-September of last year the federal Government agreed to assist the Nova Scotia Technical College in establishing a fisheries research and technology laboratory at the College. Arrangements were made for Dr. E. Graham Bligh, Director of the Department's Halifax Technical Laboratory, to be transferred to the College as director of the new lab for a two-year period, under the Executive Interchange Program. Joining Dr. Bligh at the College were Fisheries researchers Dr. R. Ackman and Dr. E. Gill. In addition, the Department donated over $400 thousand worth of equipment in order to set up laboratories and workshops which will conduct research (in such fields as quality control process engineering, product technology and marine lipids research), and enable the College to establish a complete pilot processing plant.

MARKETING STUDY INDICATES GOOD POTENTIAL

In late November, meetings were held across Canada to discuss the draft findings of a recently completed Departmental Worldwide Fisheries Marketing Study. Attending the meetings were representatives of the fishing industry, fishermen's organizations and federal and provincial governments. The study, which examines market prospects in 14 different

countries, claims that Canada's fish exports could double by 1985 with a low value of 2 billion and a high of 2.7 billion; assuming catches, their quality and market demands remain high. It implied that market development is required in certain key areas, especially Japan; the E.E.C.; Spain and Portugal.

FREEZER-TRAWLER POLICY SET

On November 30th, Fisheries and Oceans Minister James A. McGrath announced a policy setting the guidelines for the licensing of freezer and/or factory-freezer trawlers. Provisions were made:

i) for the licensing - to fish traditional and non-traditional species - of freezer trawlers to replace vessels currently licensed and active in the groundfish fishery.

ii) for new applicants to fish only non-traditional species (squid, silver hake, grenadier, capelin, argentine and offshore mackerel). A maximum of four additional licenses will be issued in 1980 for Canadian-owned or chartered vessels. Charters would be permitted for 1980 only.

iii) for the licensing - to fish non-traditional species - of freezer trawlers currently licensed to fish northern shrimp.

There are size restrictions on all replacement freezer-trawlers, and only vessels fishing non-traditional species will be permitted to carry filleting equipment.

OVER-THE-SIDE SALES

Another of 1979's contentious issues was the "over-the-side" sale of squid and mackerel to foreign freezer trawlers which led to disagreement amongst fishermen, processors and the Department. While government policy is in favour of such sales during times of glut landings, and when adequate market demand abroad poses no threat to the export sales of Canadian processors.

This past summer and fall, however, processors in Canso and Cape Breton no longer had the plant capacity to handle and freeze the surplus squid available, and because of the near-saturated Japanese market for whole frozen squid, the federal Department decided that it would be detrimental to the interests of the processing companies to license Japanese freezer-factory trawlers to buy squid "over-the-side" from the fisherman of that area. This resulted in the dumping of thousands of pounds of excess squid - squid which the fisherman had hoped to sell to the Japanese. Over-the-side sales of mackerel also floundered in Richmond County because of the failure of freezer-trawlers to arrive in the area.

Despite these apparent setbacks 6 million pounds of squid and 1 million pounds of mackerel were sold over-the-side to foreign trawlers.

STATISTICAL REVIEW
OF
MARITIME FISHERIES - 1979

MARITIMES REGION:

Preliminary figures indicate that total landings of Fish and Shellfish in the Maritimes decreased in 1979 over 1978 while their value increased. The decline in landings may be attributed specifically to decreased landings of haddock[1], herring[2] and scallops[3] (see Table 1). The statistics, at a glance, follow:

TABLE 1: LANDINGS & VALUES FOR MARITIMES REGION

	LANDED QUANTITY (in metric tons)			VALUES (in thousands of dollars)		
	1978	1979	% change	1978	1979	% change
Total groundfish	237,117	270,030	+13.8	71.7	90.6	+27.1
Total haddock[1]	40,899	33,183	-18.8	----	----	-15.0
Total pelagic	226,502	161,927	-28.5	49.4	42.3	-14.5
Total herring[2]	194,502	125,968	-35.2	33.8	26.3	-22.1
Total shellfish	160,597	153,641	- 4.3	143.7	164.7	+14.5
Total scallops[3]	108,550	88,004	-18.9	----	----	+16.3
Total Fish and Shellfish	624,216	585,598	- 6.2	264.5	297.5	+12.5

TOTALS BY PROVINCE:

While total fish and shellfish landings for Nova Scotia were down slightly in 1979 over the previous year, the total landed value of landings saw a healthy increase of 13.4 percent in 1979. The decrease in total landings may be attributed to smaller herring[1] and scallops[2] landings (see Table 2).

The value of scallops landed, however, increased to $61 million making it the most valuable seafood fished by Nova Scotians.

Total groundfish landings were up in 1979 with substantial increases in the landed quantity and value of cod[3], while haddock

experienced decreases in landings and value.

Pelagic and Estuarial species also suffered a decline with salmon[5] showing a drastic decrease.

Although the landed value of lobster[6] was down by 3.7 percent in 1979, catches were up partially due to the Lobster Vessel Retirement Program. This program was responsible for the "buy back" of over 800 lobster licenses last year. Holders of valid lobster licenses who usually fish only partime for lobsters can sell them on a voluntary basis to the Department when then "retires" the licenses out of existence. This means that, with a reduction in fishing effort, there are more lobsters to be landed by those fishermen who rely on the lobster fishery for the majority of their income.

Redfish, pollock, mackerel, flatfish, catfish and halibut all showed increased landings and values. Table 2 (below) compares figures for 1978 with those of 1979.

TABLE 2: LANDINGS AND VALUES OF MAJOR SPECIES FOR NOVA SCOTIA

	LANDED QUANTITY (in metric tons)			VALUES (in thousands of dollars)		
	1978	1979	% change	1978	1979	% change
Total Groundfish	205,138	229,574	+11.9	63,844	79,683	+24.8
Total cod[3]	80,518	105,741	+31.3	25,829	37,985	+47.0
Total haddock[4]	40,498	32,934	-18.6	17,866	15,392	-13.8
Total Pelagic & Estuarial	103,477	75,323	-27.2	25,325	23,236	- 8.2
Total salmon[5]	73	28	-61.6	383	154	- 6.0
Total herring[1]	86,445	58,670	-32.1	15,810	13,218	-16.4
Total Shellfish	136,260	123,395	- 9.5	104,090	116,229	+11.6
Total lobster[6]	6,161	6,557	- 6.4	30,532	29,124	- 4.6
Total scallops[2]	106,399	85,969	-19.2	61,856	71,605	+15.7
Total Fish and Species	444,875	428,290	- 3.7	193,259	219,148	+13.4

In New Brunswick, estimates for 1979 show a decrease in the overall landings of fish and shellfish, but an increase in their value.

Groundfish increased both in quantity and value, with cod[1] (see Table 3) showing an even more spectacular increase than in Nova Scotia. Pollock[2] began to be fished more heavily in this province as its commercial value became recognized.

Pelagic and Estuarial totals were down mainly due to decreases in the landings and values of herring[4], bluefin tuna and salmon[5]. Mackerel[6] on the other hand jumped over 100% in quantity and value.

Shellfish presented a brighter picture for New Brunswick fishermen in 1979 with both landings and values up over 1978. All species including lobster showed an increase save scallops[7].

TABLE 3: LANDINGS AND VALUES OF MAJOR SPECIES FOR NEW BRUNSWICK

	LANDED QUANTITY (in metric tons)			VALUES (in thousands of dollars)		
	1978	1979	% change	1978	1979	% change
Total Groundfish	17,482	23,350	+33.5	4,308	6,677	+54.9
Total cod[1]	7,283	11,798	+61.9	2,095	3,724	+77.7
Total pollock[2]	76	959	+1161.8	19	244	+1184.2
Total haddock[3]	336	163	-51.4	153	103	-32.6
Total Pelagic and Estuarial	119,003	81,793	-31.2	22,496		-23.7
Total herring[4]	106,019	66,320	-37.4	17,589	12,876	-26.8
Total salmon[5]	67	25	-62.6	291	113	-61.1
Total mackerel[6]	1,116	2,559	+129.3	241	634	+163
Total Shellfish	17,195	21,376	+24.3	22,906	27,991	+22.2
Total scallops[7]	1,504	1,083	-28	824	958	+16.2
Total lobster	4,156	4,365	+ 5.0	14,880	15,479	+ 4.0
Total Fish and Shellfish	153,680	126,519	-17.6	49,710	51,816	+ 4.2

Total landings and values for Prince Edward Island increased in 1979 with increases in most species of groundfish except redfish and halibut.

Amongst the Pelagic and Estuarial species, mackerel[1] (see Table 4) experienced the biggest increases along with salmon[2]. Herring, on the other hand, saw major declines in quantity and value.

Shellfish landings of scallops, squid and lobsters were all up in 1979, with the lobster[3] fishery leading the way as the island's most valuable single fishery.

TABLE 4: LANDINGS AND VALUES OF MAJOR SPECIES FOR PRINCE EDWARD ISLAND

	LANDED QUANTITY (in metric tons)			VALUES (in thousands of dollars)		
	1978	1979	% change	1978	1979	% change
Total Groundfish	14,494	17,106	+17.9	3,154	4,258	+35.0
Total cod	4,756	6,149	+29.2	1,198	1,999	+66.8
Total redfish	4,208	3,853	- 8.4	954	767	-19.6
Total Pelagic and Estuarial	4,022	4,811	+19.6	1,609	1,870	+16.2
Total herring	2,038	978	-52.0	426	246	-42.2
Total mackerel[1]	945	2,298	+143.1	184	538	+192.3
Total salmon[2]	1	2	+100.0	3	9	+200
Total Shellfish	7,142	8,872	+24.2	16,739	20,434	+22.1
Total lobster[3]	4,699	5,338	+13.5	15,460	18,032	+16.6
Total scallops	647	952	+47.1	371	815	+119.6
Total squid	1	511	+511	---	233	---
Total oyster	1,059	1,044	- 1.4	648	763	+17.7
Total Fish and Shellfish	25,661	30,789	+19.9	21,502	26,562	+23.5

FIELD SERVICES BRANCH

1979 was the third year that the Branch operated under the Area Management concept. Further steps were taken to decentralize decision making in day-to-day operations at the field level.

Several major events occured during the year. These affected or will affect, in one way or another, the operation of the Branch, and include:

- the transfer of the Director, C. W. Shinners to the Pacific Region
- the start of an in-depth program review to lay out priorities and requirements for staffing
- the retirement of J. E. Creeper, Assistant Director in December.

The Field Services Branch, with a staff complement of some 520 person years, is the largest unit in the Region. It has responsibility for field operations including Conservation and Protection, Inspection, Fishermen's Services and Community Services.

The Branch is divided into six geographic areas with managers located at St. Andrews, N. B., Shippegan, N. B., Yarmouth, N. S., Halifax, N. S., Sydney, N. S., and Charlottetown, P.E.I.

Emphasis was placed on consultation with fishermen and processors in the development of programs and policies. This was conducted through various regional area and zone-established committees to deal with various fisheries on a species basis.

This report summarizes the activities of the regional headquarters groups, and the various achievements and problems in the area.

SUMMARY OF ACTIVITIES 1979 - CAPE BRETON ISLAND

During 1979, the fishery of Cape Breton Island continued to expand both in production and value. The inshore/nearshore multi-type operation, which represents the largest segment of the commercial fishery generally proved to be a success, with increased earnings recorded by most fishermen. Trawler crew members also experienced a very successful year, even though quotas at times restricted their operation.

Total landings of all species increased by 26 million pounds over landings of 1978. A grand total of 147 million pounds was landed for a value in excess of 25 million dollars.

Some of the more productive accomplishments undertaken during the year included:

- The sectional meetings, sponsored by the Area Office, held throughout Cape Breton Island and which included representation from the province of Nova Scotia as well as Devco. During these meetings, the 1980 Commercial Fishery Management Plans were outlined.

- The management plan for the Margaree River Salmon Fishery, resulting in record catches of grilse. (Over 500 fish landed by anglers)

- The development of A Cape Breton Area Shellfish Advisory Committee including representatives of E.P.S., Province of N.S. Fisheries, Dept. of Health, Oyster Producers Assoc., and Federal Fisheries and Oceans.

- The development of a Recreational Fishery Advisory Committee for Cape Breton Island, with representation from Federal-Provincial Fisheries as well as Wildlife and Fish Game Associations from the Island.

- The successful curtailment of a serious oil pollution threat, in which many of our Field Personnel were directly involved.

- The crackdown on illegal lobster fishing by the Area's mini "Special Force". Illegal lobster fishing by scuba divers was on the increase; but, as a result of very substantial fines and the forfeiture of expensive equipment, this illegal activity was brought to a standstill.

- The discovery of new snow crab stocks in the Inverness and Port Hood areas through exploratory fishing by fishermen of Inverness County.

- The development of a ready market for oysters by producers involved in a summer marketing program.

- The successful survey of all groundfish vessels as a part of our Quality Improvement Program, ably assisted by members of the Youth Job Corp.

- The educational programs undertaken by the Inspection Service toward better fish products, with vessel crews and industry personnel.

- The successful continuation of the ice-making and storage facilities program on the Island.

- The development of a bait freezer and a bait shed facility in concert with the Provincial Fisheries and Fishermen's Association of Louisbourg, and the fishermen of Louisbourg.

- The successful demonstration of the automated squid jig system through the efforts of Fisheries Development Branch and the C.S.O. in Louisbourg. This demonstration was undertaken by a fisherman from Big Bras D'or.

- The experimental stern drum seine operation, which hopefully will prove successful. This project was also sponsored by the Fisheries Development Branch in co-operation with Devco, the province of Nova Scotia Fisheries, and a Louisbourg fishermen, Mr. Claude O'Hara.

- The surpassing of over 500 policies written up by the local Fishery Vessel Insurance Appraiser, a Maritimes Regional record.

The year was not without its problems; problems associated with the cautious development of the snowcrab fishery; the frustrations experienced by local fishermen in trying to market an abundance of squid along our entire coast; the failure of the over-the-side sales of mackerel for Richmond County, because of the failure of the freezer trawlers to arrive in the area; the gear conflict; the conflict between inshore fishermen and the mobile herring fleet; and finally, the inability of the fisheries to organize under one umbrella.

SUMMARY OF ACTIVITIES 1979 - CENTRAL NOVA SCOTIA

During 1979, the field staff of Central Nova Scotia placed major emphasis on the management and development of the commercial inshore and offshore fisheries through close consultation with fishermen's groups, industry representatives, and Nova Scotia Provincial Fisheries representatives. The past year saw major developments in most fisheries, and these are highlighted below:

- Excellent groundfish landings and values for all sectors of the fleet, particularly the Lunenburg-Riverport and Canso offshore fleets, and the inshore Danish seine fleet in the Bickerton-Larry's River-Canso area. This can be somewhat attributed to the improvement in fish stocks along the Scotian Shelf, particularly 4VSW codfish.

- A successful buyback program was initiated for groundfish gillnets along the Eastern Shore in Guysborough County, with a total of 1484 nets purchased from 102 fishermen. This buyback program eliminated a serious conflict between gear types, and has improved the quality of groundfish landed in that area. The groundfish gillnet fishery also came under a management plan in Halifax and Lunenburg Counties, whereby restrictions were placed on gillnet fishing outside of the 12 mile limit during the winter months, and the number of nets per vessel was limited to 40.

- The lobster fishery experienced record catches in Lobster Fishing District 7B1 (Northumberland Strait area) with landings in excess of 2.2 million pounds, as compared to 1.7 million pounds in 1978. The landed value of these lobster landings also increased from $2.7 million up to $3.6 million. The Lobster fishery in District 5 & 5A (Eastern Shore of Nova Scotia) again reported poor catches declining slightly from the previous year to a total of 213,309 pounds for a landed value of roughly $420,000. However, biological studies

have indicated that significant numbers of juvenile lobsters are in evidence along the Eastern Shore which is the first positive indicator that lobster stocks in this area may improve in the next few years. This trend may be due to a marked decline in effort caused by the lobster buyback program, which provided an incentive for over 200 fishermen (out of 700) to retire their licenses in Lobster Fishing Districts 5 & 5A. Furthermore, a reduction in the length of the lobster season (of two weeks) was implemented in 1979, along with limitations on the maximum hoop sizes for lobster traps.

- The development of the inshore squid and mackerel fisheries continued with marked increases of participation in squid jigging and trapnet fishing for these species, primarily in the Chedabucto and Georges Bay area. Direct ("over-the-side") sales to foreign trawlers occurred in two areas of Central Nova Scotia - Chedabucto Bay and St. Margaret's Bay. Approximately 6.4 million pounds of squid and 1 million pounds of mackerel were sold directly to foreign buyers. This marketing program resulted in both higher prices and landings to the inshore fishermen for both domestic and foreign sales.

- The development of increased participation in the inshore snow crab, Jonah crab and shrimp fisheries through exploratory fishing in areas not previously exploited by fishermen.

- The introduction of inshore experimental mackerel and squid seining operations, by means of small ring seines, experienced some success.

- The introduction of a new Bluefin tuna angling policy created a strong interest in angling in the St. Georges Bay area of the Northumberland Strait. Here, 118 Bluefin tuna were landed by rod and line during a five week period in the late fall, as compared to 2 tuna in 1978. Trap net catches of Bluefin tuna in the St. Margaret's Bay area of Halifax County were dismal compared to 1978, with a total of 100 tuna landed, compared to 530 landed in 1978.

- Inshore herring catches in the Northumberland Strait by drift and set gillnets were excellent in the past year, with landings in excess of 2.8 million pounds, compared to landings in 1978 of roughly 800,000 pounds. Increased landings appear to be the result of the exclusion of large mobile purse seine vessels from the Northumberland Strait Inshore Fishing Zone, and due to a large number of new entrants into this fishery in the Pictou-Lismore areas.

- The scallop fishery evidenced declining catches in both the offshore and inshore (Northumberland Strait) segments. However, strong prices (as high as $3.50/pound) produced record landed values as compared to previous years. Offshore scallop landings made by the Lunenburg-Riverport fleets declined by 19%, from 18,836,175 pounds in 1978 to 15,200,049 pounds this year. Biological evidence suggests that the population of scallops on Georges Bank is on the decline, and the Canadian scallop fishing vessels are being forced to mix their catches and take higher proportions of smaller scallops than traditionally landed by these vessels. This situation has been confirmed by a direct increase in the incidence of scallop meat count violations toward the end of this year.

- The continuation of the Quality Enhancement Program included the promotion of insulated fish boxes, better unloading facilities, bait and product freezers and better organized transportation of fish from the wharf to the plant. Financial assistance for ice making and storage facilities also aided a number of small processing companies in Central Nova Scotia.

In view of the accomplishments of the past year, the primary considerations for 1980 will be to promote better communication with fishermen and industry, to organize port committee representation and to promote the development of those fisheries which are presently under-utilized such as snow crab, inshore shrimp, Jonah crab, other shellfish species and gaspereau.

It is also the priority of this area to reduce the problems associated with conflicts of gear between different sectors of the industry by attempting to conciliate agreements between these different sectors, without extensive government regulation or intervention. It is also anticipated that greater emphasis will be placed on fish quality improvement and marketing projects.

SUMMARY OF ACTIVITIES 1979 - SOUTH WEST NOVA SCOTIA

Bay of Fundy Herring Fishery

Smaller catches and smaller fish were experienced in 1979. An increased demand for Inspection Certificates led to more monitoring of herring exports, and indicated generally poor quality and workmanship. District personnel participated in a workshop establishing tentative grade standards to help combat poor herring quality. The use of unapproved herring unloading water was curtailed in 1979 by using air unloaders. More work remains for 1980.

Problems existed all season in the seine fishery. Fish were small - seven to ten inches - and were generally low in fat content. The seine fishery was closed in June, and reopened by Special Individual Permits. It was again closed in August for four days due to small fish. The total seine catch was 25,810 M.T. The set gillnet and driftnet fisheries were considered good by comparison, landing 1,009 and 3,400 M.T. respectively. The two-week closure on the Trinity Ledge to seiners appeared to benefit the operations of the drifters.

GROUNDFISH

The increased demand for Certificates utilized the resources freed from mandatory inspections which were suspended in 1979. A policy prohibiting the salting of Grade 3 fish was adopted. Enforcement of Section 20, 21 and 22 was emphasized to improve transportation of fish. A significant shift in attitude was found as a result of the Quality Improvement Program as processors began to stress quality.

The Fish Chilling Assistance Program was well received during 1979, as was the subsidy on Insulated boxes. These programs will alleviate quality problems associated with lack of ice.

Our efforts to control quotas this year were more positive than 1978. However, the cost in person-years, which subsequently reduced our enforcement efforts in other fisheries, may have affected the overall benefits. Stricter enforcement practices, in 1980, would no doubt resolve this difficiency.

SCALLOPS - INSHORE

The practice of shucking scallops in polluted harbours was stopped by threatening to lay charges and detain scallops washed in unapproved water.

We experienced better results maintaining control of fishing within the six-mile closure area. This was due to a full-time patrol vessel at Digby, and the use of a radar equipped 20' launch. Many Bay of Fundy vessels successfully fished the German Bank during the summer, due to the scarcity of scallops on Georges Bank.

SCALLOPS - OFFSHORE

The Georges Bank fishery was generally poor. Most vessels were fishing the German Bank catching scallops in the 60+ meat size. They would then even out the catch to 40 meats by fishing on Georges and Browns Banks. Very few vessels were able to land 30,000 lbs per trip. As the overall resource is declining, our enforcement efforts will have to be stepped up in 1980.

One American scalloper was apprehended and charged for fishing in Canadian waters and appeared in court at Liverpool, pled guilty and was fined $1,000, however, the court ordered forfeiture of 2,000 pounds (total catch) of scallops, valued at $6,500 and which were sold locally.

LOBSTER

A Gaffkemia epidemic, resulting from poor storage conditions, marred a season of record high prices. Work was conducted to ensure there is no repeat of this unfortunate development.

LOBSTER - OFFSHORE

The offshore lobster fleet consists of eigh vessels operating out of the following ports: Port Mouton, Lockeport and Shelburne. Offshore lobster vessels operate a year-round fishery between areas 4x and 5. However, they are restricted to fishing no more than nine months or 150,000 pounds of lobster from 4x area, whichever comes first. Further, two of the offshore vessels are restricted to fishing Area 5 only, and under no circumstances can they carry out their operation in Area 4x.

The eight vessels being utilized in the offshore fishery landed a total of approximately 1,339,882 pounds of lobsters during the past year.

The value of this fishery ranges between three to four million dollars annually.

CLAMS

Home-shucking and digging in unapproved areas continued to be a problem. A Clam Depuration Project was initiated upon the completion of a clam cleansing unit and the acceptance of proposed operation protocol by the Maritimes Standing Shellfish Committee.

High levels of P.S.P. resulted in closure of all of Annapolis Basin in 1979. Only one poisoning was reported resulting in the destriction of one date code of shucked clams.

GASPEREAU

Effort was restricted to the 1978 level. It is our intention to reduce the number of nets in this fishery over a period of years. It is also intended to close the fishery on the same date as the lobster fishery closes and the need for bait ceases.

UNDERUTILIZED SPECIES

During the past year, a considerable effort was put forth by inshore fishermen on squid. Local inshore fishermen landed upwards of approximately two million pounds of squid.

Several plants processed squid landed by Japanese Freezer Trawlers under Developmental Charters. In preparation for this activity, Inspection personnel developed tentative grade standards. Quality was generally good, with only one lot being rejected.

SUMMARY OF ACTIVITIES 1979 - SOUTHERN NEW BRUNSWICK

HERRING

Herring continued to be the most active fishery. The purse seiners and weirmen experienced a much different year in 1979. For the purse seine fleet, the winter fishery in the Bay of Fundy was poor, with under 50% of the quota being caught. This continued throughout the summer, with less than 50% of the 4X quota being caught. In contrast, weirs (particularly those on the New Brunswick side of the Bay of Fundy) caught exceedingly large quantities of herring leading to glut situations, lack of markets, illegal sales for meal in the U.S. and Canada, dumping of herring, etc.

In reference to processing facilities, several events occurred in the 1979 year namely:

a) Connors Bros. Limited constructed a 2,700 ton Cold Storage facility at Black's Harbour.

b) The Head Harbour herring filleting plant on Campobello Island commenced construction, after several years of discussions.

c) The Seafare Ltd. plant at Woodward's Cove, Grand Manan, suffered severe financial hardships, due to the lack of large herring.

d) Several plants, namely Kennebec, Nickersons and Connors Bros. Ltd. had an excellent year in the herring operation.

GROUNDFISH

A substantial groundfish fishery was carried out by twenty fishermen in the Dipper Harbour area from the months of April to July.

In addition, handline, longline and gillnet fishermen operated successfully throughout the summer and fall seasons. A gillnet policy on Grand Manan proved successful, and will act as template for other gillnet activities in the area.

SCALLOP

This fishery became quite intense, with new beds being fished. All scallops are sold locally.

LOBSTER

Catches of lobsters remained average for 1979, with slight increases in Lobster District #1. Lobster District #2 saw catches remain steady, as in previous years.

CLAMS

High PSP levels during the summer period closed all shellfish harvesting areas. In addition, there was concern on international markets, as approximately 125 gallons of shucked meat, high in PSP, found their way into the U.S. Markets. All were recovered on a recall.

On a general note, shellfish harvesting improved, with increases in volume and prices being experienced in 1979.

EELS

Landings remained at levels consistent with 1978 levels, i.e. approximately equal to 240,000 lbs. However, the average size was reduced drastically. A committee has been established to study this situation and develop a policy to ensure a viable fishery.

GASPEREAU

Landings approximated 1978 levels. However, by-catch in the Saint John Harbour area, continued to be a problem. Sale of gaspereau from the Mactaquac area, through Crown Assets Disposal Corp., proved successful.

SALMON

The establishment of an Advisor for the Indian Food Fishery (Mr. Hugh Trudeau) has allowed a greater degree of communication, particularly in the Kingsclear area.

The illegal apprehension of salmon and by-catches continued to be two major problems.

The continuation of the Zenith number in the Fredericton area has proved an on-going success, particularly over the summer season. This is a toll-free number which was installed to encourage the reporting of illegal salmon fishing activities.

OTHERS

Several other fishery operations were:

1) tuna processing
2) winter ice fishing
3) squid fishery
4) sturgeon fishery

The above were all active in 1979. The tuna processing by Ocean Maid Foods Ltd. continued its high level of productivity on a 12 month/2 shift basis. During the year, a large number of squid (Illex) were harvested from the Bay of Fundy, providing bait and food supplies. Sturgeon fishing continued in 1979, with a 15.5 ton catch.

GENERAL

A third Community Services Officer (David H. Thompson) came on strength in 1979. This proved highly successful as a means of organizing the Saint John - Maces Bay area. Establishment of the Fundy North Fishermen's Association can be evidenced as an extremely positive approach for this area, as well as several port committees.

In addition, on Grand Manan, a committee of fishermen from various ports on the island has been assembled for the purpose of providing input on enquiries, and representing fishermen of the area in discussion matters.

Establishment of a fulltime Quality Improvement Officer with the Inspection Division allowed inroads into discussions, and development of standards to improve the landed quality of fish.

SUMMARY OF ACTIVITIES 1979 - NORTHEASTERN NEW BRUNSWICK

GENERAL OVERVIEW

The fisheries, in both the inshore and offshore sectors, has been generally good, although some species for particular fishermen have been disappointing.

Cod, crab, lobster, mackerel, shrimp have shown increased landings, in particular crab. The processing sector for crab operated in the area on a three shift basis for a fairly lengthy period of time, and figures for 1979 indicate a 37.9% increase in landings with values up 73.6% over 1978. Such increases in landings, coupled with expectations of increased availability of resources, has triggered in Northeastern New Brunswick, particularly above the Miramichi, an expansion of fish processing capacity in 70% of the processing establishments.

Inshore herring, and offshore redfish however, did not demonstrate sustained landings.

For some species, prices which were generally stable in the area, increased substantially for a variety of reasons, including over the side sales. Herring, in particular for inshore fisheries, increased in price.

Management problems related to the fishery were abundant. Serious problems which should be mentioned are the confrontations which occured between inshore and seiner fishermen over herring stocks in Northern New Brunswick. Landings of small crabs and the excessive use of traps were difficult, if not impossible, to control. The problems of salmon and lobster poaching were ever present.

HIGHLIGHTS IN 1979-80

- Over-the-side sales for gaspareau and mackerel have benefited the region, in particular the gaspareau fishermen from the Miramichi area.

- Development projects for the area have seen possibilities of benefiting over the long term. Such projects are capelin pair seining, inshore pair trawling (scottish), the insulation of fish holds with sorters for shrimp vessels, and the use of gutting machines.

- A quota increase of 4000 mt for vessels less than 100 feet in 4T was very beneficial to the fishing industry in the offshore sector.

- The Protection Plan, as developed by the M.F.U. in the District #8 lobster fishery, had positive effects overall in controlling illegal lobster fishing activity.

- The acquisition was made of a regional biologist responsible for gathering and disseminating information in the fishing industry.

- The herring fishery confrontation in Northern New Brunswick between inshore fishermen and seiners was of national interest, and will have long term effects on relations existing between both groups.

- Market conditions in the lobster industry of Eastern New Brunswick caused the reduction in price for lobster of approximately 20%, as well as the closure of one of the largest lobster production plants in Eastern New Brunswick.

- The reintroduction of vessels greater than 100 feet into 4T for 1979 caused great concern in Eastern New Brunswick and as such, increased pressure on the Department to reverse such a decision.

SUMMARY OF ACTIVITIES 1979 - PRINCE EDWARD ISLAND

DEPARTMENTAL ORGANIZATION

A staff of 60 carried out fisheries management duties in the field of Conservation and Protection, Inspection, Fishermen's Services and Small Craft Harbours. The annual salary expenditure was about $812,422.00.

In additional, approximately 30 summer students were employed under various employment programs, and provided assistance in statistical enhancement, scallop research, fish quality improvement and office support.

MAJOR ACCOMPLISHMENTS

1. Staff

   J.W. Morriscey was appointed the P.E.I. Small Craft Harbours Program Manager, providing the much needed direct contact for Island fishermen. Mr. A.M. Aitken was appointed as the Area Statistical Co-ordinator. Staff development received a higher profile, with courses noted in seasonal officer training, law enforcement, fish quality assessment and various P.S.C. courses. A major two-day review and planning study was held, involving virtually all Area personnel.

2. Public Relations

   A float entered in the annual Gold Cup & Saucer parade claimed first prize in the Commercial Division. Participation in fairs in Alberton, Charlottetown and Dundas were also highlighted. The Area Newsletter was published, and increased communication with the media was stressed.

3. Protection Programs

   The Co-Management Lobster Protection Program was expanded to take in most of Prince County. The expenditure of $112,000 was considered to be well worth while, as progress

in the eastern areas of the county was significant enough to allow for a downscaling of activities in that area in 1980. Illegal activity at the heavily poached 7B/8 lobster district line was reduced by 80%, according to local fishermen. Prosecutions on P.E.I. remained at the 1978 level, but it is common concensus that the incidence of illegal fishing was down. It is felt that the improved communications and the increased atmosphere of co-management on an area-wide basis, has assisted in this regard.

4. Inspection Programs

Inspection Division monitored activities at 36 registered plants. Three new plants were added in 1979, and four major expansions were noted. Major efforts were expended in the area of canned fish quality and canning systems improvement. Twenty-seven applications under the Fish Chilling Assistance Program were received, and nine applications approved for subsidy. Mr. L. Darrach assumed the duties of Fish Quality Improvement Officer in 1979. The high priority and visibility of this program is noted to have increased the awareness of all levels of the industry for the need of a first quality product.

5. Fisheries Management

Advisory committees are functioning in virtually all fisheries. Significant federal input was provided in the area of the Comprehensive Development Plan.

FISHERMEN'S SERVICES DIVISION

This Division is responsible for the administation of the Fishing Vessel Insurance Plan, the Fishing Vessel Subsidy Program and other ad hoc programs of assistance to fishermen.

The Fishing Vessel Insurance Plan

This plan provides marine insurance for approximately 40 percent of the fishing vessels in the Maritimes. From January to November inclusive, premiums amounted to:

Premiums Received	$1,548,124.49
Service Charge on Time Payments 77 Contracts	5,168.81
Total Receipts	$1,553,293.30
Claims Paid - 172	1,233,413.35
Excess Premiums Over Claims	$ 319,879.95
Less Refunds Resulting from Sale of Vessel, Overpayments, Reduced Rates, Transfers, etc.	150,076.06
Surplus	$ 169,830.89
Accounts Receivable	223,425.00
Total Assets	$ 393,255.89
Costs of Operating Fishermen's Services Division (Includes all FVIP Personnel, Headquarters and Field)	$ 440,000.00
Projected Contribution to Consolidated Revenue Fiscal Year 1979-80	$- 46,744.11

Vessels Insured - January - November 1979

	No.	Insured Value
New	918	$28,627,375.00
Renewals	2,202	53,115,570.00
	3,120	$81,742,945.00

During the previous four years, the plan was in an advantageous position with regard to premium/claim ratio, and contributed a large amount of money to the consolidated revenue fund. Because of this situation, it was decided to reduce the premium rate on October 1, 1978. This reduction in rate, combined with a very rapid escalation in repair costs on claims, has put us in a small deficit position this year. Premium rate structure will be reviewed in the coming year.

On September 7, 1978, notice was received that the Fishing Vessel Insurance Plan might be terminated in keeping with the government policy of privatizing those services that could be performed by the private sector. This proved to be very unpopular with the fishermen, and in April of this year, the plan was given the go-ahead for the forseeable future. A number of commercial brokers are actively competing for the better risks. This is proving to be beneficial to the fishermen, in that they get the best possible rates, and to the plan, in that it is forced to keep abreast of todays trends in the insurance field.

FISHING VESSEL SUBSIDY PROGRAM

VESSELS SUBSIDIZED 1979

JAN.-MARCH (INCL.)

	25' LOA-45' LOA (INCL.)		OVER 45' - 75' (INCL.)	
Prov.	No. of Vessels	35% Subsidy	No. of Vessels	35% Subsidy
N.S.	30	396,828.43	1	107,569.00
N.B.	21	144,079.85	4	472,053.70
P.E.I.	17	262,775.20	0	--

APRIL - DEC. (INCL.)

Prov.	No. of Vessels	35% Subsidy	No. of Vessels	35% Subsidy
N.S.	75	1,138,207.37	1	169,400.00
N.B.	83	655,885.83	5	1,098,241.00
P.E.I.	83	627,623.99	0	--

INSPECTION DIVISION

The Regional Inspection Division has the responsibility of ensuring that the inspection programs are carried out and enforced in a uniform manner. Programs have been developed for the inspection of fish quality at the following stages in the processing cycle: vessels, landing sites, transportation, processing establishments, storage and marketing. Coupled with the above, research is conducted that concentrates on specific problems encountered with the processing and marketing of fishery products.

A disproportionate number of problems were encountered with regard to the canning of fishery products in the Maritimes Region. As a result of four illnesses, one processing plant was required to carry out a voluntary recall of its canned products from the marketplace. Later in the year, an extensive problem associated with "pinching" of the can hook radius at the side seam of the can manufacturer's end was encountered. Only after extensive culling and inspections, were the products involved released for sale.

A joint inspection, with the Health Protection Branch, National Health and Welfare and our Department, was carried out on canneries in six (6) Districts. This indicated a number or problems associated positively with the installation and operation of canner's retorts, and other operational deficiencies and deviations. Suspect production from a number of plants inspected was placed under detention for sterility testing and organoleptic examination; however, the majority was later released after extensive sampling and inspection. A program of training and education, coupled with more stringent installation and operational requirements for the upcoming canning season, is planned for early 1980.

Problems were also encountered with the alewive production from the Margaree Valley of Cape Breton, N.S. After an original inspection in the Margaree Area, the majority of this production was brought to Halifax waterfront for storage

and subsequent shipment south. A routine inspection at the piers indicated that some of the approximately 20,000 x 50 lb. pails had deteriorated to reject quality. Following three weeks of re-inspections, 70% of the product was found to be of acceptable quality, while the remainder was rejected.

The Fish Chilling Assistance Program, providing financial assistance for ice making and ice storage facilities or vessel insulation or chillers, was allocated $1,147,000.00 this fiscal year.

The following table summarizes the program:

	LAND FACILITIES			VESSELS		TOTAL
	No.	Tons/day	Grants	No.	Grants	Grants
Nova Scotia	26	226.5	$697,986.79	1	$ 3,200.00	$701,186.79
New Brunswick	6	46.0	135,163.24	6	94,263.00	229,426.24
Prince Edward Island	6	52.0	199,286.98	1	4,000.00	203,286.98
TOTAL	38	324.5	1,032,437.01	8	101,463.00	1,133,900.00

Quality Improvement Program activities included: a series of explanatory, promotional meetings with Industry; appointment of in-field Area Q.I. Officers; physical survey of a cross-section of fishing vessels; demonstration of more efficient handling methods, and fish quality assessments at dockside and in plants. An inaugural meeting with Maritime Provincial representatives was held to explore the potential for a proposed, on-going Federal/Provincial/Industry Q.I. Committee.

With more emphasis being placed on the application and enforcement of Inspection Regulations, four workshops of two days each were held to introduce Inspection Officers in the basics of enforcement. These workshops were followed up by a highly successful, one week enforcement course.

As a result of cutbacks and reorganization, part of a Research Section of the Technology Branch was transferred to the Inspection Division in 1979. New terms of reference for the group now include for the most part development of under-utilized species; preservation of fish quality including microbiological and chemical changes; development and/or improvement of inspection methods; preparation of technical information for the use of all sectors of the fishing industry; development of training aids and assistance in training programs.

Areas of study and research included: Polycyclic Aromatic Hydrocarbons (PAH); Depuration of Soft-shell clams; Radioactivity Contamination of Marine Samples; a Scientific histamine estimation procedure; Assessment of the Childress Method for PSP estimation; bruises and spoilage of fish, and development of artificial biat for lobster.

Other miscellaneous responsibilities were carried out by this Section, including: taste panel assessments; supervision of two government contracts; responding to numerous technical inquiries from foreign countries, local Industry and private citizens; heat process calculations for various canned fish products; the conducting of workshops on Mackerel, Squid, etc. for industry.

A demonstration and discussion on "Squid Drying" were held in Canso, Nova Scotia, for inshore fishermen.

CONSERVATION & PROTECTION DIVISION

The Division is responsible for the conservation, protection and enhancement of the primary, commercial and recreational fishery resources.

The mandate as outlined above is managed by the development and application of the various fisheries regulations. The Division provides guidance and advice on the operational programs of eight (8) Protection Districts. It supervises the recruitment and training of Fishery Officers; directs the activities of the International Surveillance and Quota Unit, the Maritimes Licensing Unit, the Observer Program, the Special Enforcement Unit, and actively participates on numerous fishery management committees. The following is a summary of the accomplishments of the past year's activities.

FISHERY MANAGEMENT

C & P Headquarters participates in various fishery management committees responsible for the development of fishing plans, offshore surveillance, quota control, and of regulation. These include Atlantic salmon, groundfish,scallops and herring. In addition, input and leadership was provided for the development of the foreign fishing plans within the 200 mile limit.

The division monitored the catch and fishing activity of over 500 offshore and 10,000 inshore vessels fishing 14 species of groundfish divided into 53 quotas as well as 10 herring quotas. In additional to these species, monitoring of tuna, scallop, and shrimp catches were conducted.

INTERNATIONAL SURVEILLANCE

This Section reports the following:

VESSEL OPERATIONAL DAYS	Total		AIRCRAFT SURVEILLANCE (Maritimes Region)		
			Dedicated	Multi-Task	Total
D.F.O.	585.8	Tracker Hours	1140.1	532.5	1672.6
M.O.T.	62	Argus Flights		18	18

TOTAL BOARDINGS (Maritime Region) ARE:

	Domestic	Foreign	Joint	Total
Sea	170	158	53	381
Port		96		96
				477

FOREIGN LICENSING UNIT

The Unit processed 249 licences and 191 amendments. This Unit also monitored and assessed licence and fishing fees to the foreign fleets to a total of approximately $2.2 million.

INTERNATIONAL OBSERVER PROGRAM

Observers amassed over 4,300 total sea days, an increase of approximately 700 sea days over the 1978 level. In so doing, a total of $650,000 was generated in foreign observer fees,

up $414,000 from 1978.

The most significant development was by way of the expansion of activities which enabled the department to maintain a year-round observer presence. Activities which now form part of the program are:

i) Canada/France Treaty Agreement
ii) Foreign Allocations
iii) Northern Shrimp
iv) Japanese Tuna
v) Domestic Groundfish, and
vi) Domestic Swordfishing

MARITIMES LICENSING UNIT

The Licensing Unit registered domestic commercial fishing vessels, and licensed commercial fishermen. The unit processed 11,500 vessels and 18,500 fishermen - a slight increase over the previous year. This program generated $155,000 in fees.

A total of 27,000 Limited Fishery Licences and Personal Licences for Specific Fisheries were processed for computerization by the Unit.

Total Documents Processed	57,000
Total Revenues Generated	$325,000

FISHERIES DEVELOPMENT BRANCH

The newly formed Fisheries Development Branch is made up of three divisions, Program Development, Engineering Services and Operations and has, over the past year, carried out a number of development projects, as detailed below:

SQUID PROGRAM

The 1979 Squid Fishery Development Program was made up of a number of different projects:

Offshore squid jigging was conducted to determine the seasonal distribution and extent of inshore and offshore stocks, as well as to demonstrate the latest in harvesting techniques. Five Japanese automated jigging vessels took part in the project. The vessels were allowed to take up to 5,000 MT of squid, and in exchange for this allocation, a total of 150 days of controlled biological surveys were carried out. These surveys are now complete, and the data is being compiled and analyzed by the Resource Branch.

As part of the offshore program, Canadian fishermen and industry representatives were able to make trips on these vessels to observe the fishing operations, and learn the techniques involved.

Two small inshore vessels, one 38 feet, the second 42 feet in length, were rigged with automated jigging machines, squid attracting lights, as well as other gear necessary for squid fishing. Japanese technical expertise was also made available. Both vessels landed in excess of 200,000 pounds of squid in less than two months of fishing. The success of this project has created a great deal of enthusiasm in the inshore sector. In one area, a number of fishermen studied the Japanese equipment, and were able to produce their own gear suited to particular vessels at a fraction of the cost of the imported machines.

The Department of Supply and Services is now negotiating on behalf of the Department, with a Canadian company to rig a mid-sized vessel to fish squid. The vessel will have all the necessary equipment to jig for squid offshore, and to freeze and hold the catch. The vessel will probably be ready to commence fishing at the beginning of the squid fishery in 1980.

The great potential for profitability of both an inshore and offshore Canadian squid fishery has been well illustrated by our experience over the past year.

PAIR BOTTOM TRAWLING - GROUNDFISH

This technique was demonstrated in Northern New Brunswick (Lameque Area) and Prince Edward Island (Souris Area). Pair trawling enables small and lightly powered vessels to engage in bottom trawling, a method usually suited to only large H.P. boats. The method is more economical and productive than single boat dragging. Tests and calculations have indicated that on a single boat dragger the doors create up to 40% of the drag load. As bottom draggers do not require doors to keep the net open, they consequently may pull a net which is twice as large as that towed by one boat with an engine equivalent to the combined H.P. of the pair.

Comparative tows indicated anywhere from a 2-1 to 5-1 increase in catches over conventional single boat methods. Fishermen are very enthusiastic, and many new enquiries have been received for further demonstrations.

EXPERIMENTAL CAPELIN FISHERY

The pair midwater trawl technique was used for this project, and as with pair bottom trawling, it allows two small vessels to tow a much larger net. The two small vessels employed spent 14 days of actual fishing with a total of 40 productive tows. A

total of 175.6 metric tonnes were caught. Of the total catch, 6½ tons were utilized for human consumption and sold as roe capelin for $200-220 per ton. The balance went for fish meal at $30 to $35 per ton.

These results were encouraging; however, it is felt that, with a high percentage of females, a far greater amount should have been utilized for food.

STERN DRUM SEINING

Continuing the development of stern drum seining- a new fishing technique conceived by the Branch - an agreement was reached with a Cape Breton skipper to assist him in the conversion of his vessel. The 44 foot vessel was outfitted with a combination split drum net reel, spooling gear, auxiliary hydraulic power unit and other related items. A seine designed by the Branch, was provided by Devco. Fishing trials have been severely hampered by the lack of schooled fish in this area. However, recent indicators are that problems related to the gear have been solved. Early trials have landed herring, but in most instances, the herring were released alive because of their size.

INTRODUCTION OF A NORWEGIAN SJARK

A fisherman has been assisted in purchasing and importing the first sjark class vessel to Canada. The project was instigated after a Branch officer viewed similar vessels in Norway. The 42-foot fibreglass vessel is the first of its class in the world to be equipped with a full shelter deck. Installed on board is a complete Mustad autoline system equipped with 11,000 hooks in magazines. The mustad system is the equivalent to systems used on 100-125 foot boats in Europe. This boat is the smallest vessel in the world with this complete system. It will be fishing out of Campobello Island in the

coming months, and hopefully will be demonstrated next summer in various locations in the Maritimes.

PORTABLE BLAST FREEZER

The portable blast freezer has been demonstrated in five locations in the Maritimes, and is currently at a plant in the Digby area where it is being powered by a diesel generator. This is an important test, because in many areas in Atlantic Canada the 550 volt power required by the freezer is not readily available.

Trials with the unit ended on January 30, 1980, at which time ownership reverted back to the manufacturer, Associated Freezers. In one respect, trials were disappointing in that in some areas the freezer was not utilized to full capacity because of a lack of fish, or as a result of other complicating factors. Overall, though, the project was successful, and it generated a tremendous number of inquiries from all sectors of the industry. The feeling among many is that units of this sort can and will be used effectively in the years to come.

DEMONSTRATION OF GUTTING MACHINES ONBOARD INSHORE FISHING VESSELS

In cooperation with the Inspection Division, a project to determine the technical feasibility of operating gutting machines onboard small inshore vessels from 45-65 feet has been initiated with the ultimate objective of improving the quality of landed fish from vessels of this size range.

One Baader 159 gutting machine has been leased and operated onboard a 65 foot vessel out of Shippegan, N.B., during October and November. Trials were successful, with satisfactory results on the gutting operation.

The Jutland MKIII gutting machine, owned by the Department, was changed from electric to hydraulic power for small vessel operation, and was tested on board a 43 foot pair seiner operating

out of Souris, P.E.I., during November, Due to a late start and bad weather, trials have been very limited. Approximately 5,000 pounds of cod and hake were gutted with satisfactory results. Further trials with this vessel are planned for spring, 1980.

Trials are planned for South West Nova Scotia and Bay of Fundy during winter, 1980.

SHRIMP PROCESSING ABOARD VESSEL

During 1978-79, a shrimp grader was installed on a fishing vessel out of Caraquet, which grades shrimp into 2 size groups. This has resulted in an increase of $ .08/lb. over the market price for normal size shrimp being paid for larger shrimp. A hold chill unit was also installed, and has substantially reduced ice usage. The fish hold was insulated in preparation for use as a frozen storage hold. Mesh bags were introduced to facilitate handling, and to improve present bulk icing practices.

This fiscal year, an automatic cooker will be installed for evaluation, as will a shrimp-trask separating device. The main thrust of the effort at this time is to design, build and install an automatic blast freezer for use on deck.

It is intended that, during the fiscal year 1980-81, the total system will be operated as a total processing facility with modifications and improvements made as required.

SCALLOP SHUCKING AND WASHER

This is a continuing project to design, develop and demonstrate a prototype scallop shucking machine. To date, the machine has successfully performed all operations on a small scale, and considerable interest in the unit has been generated in the private sector.

The eviscerator is the only remaining operational device that requires further development. At this time, we are confident

that a successful operation or series of operational devices will be developed.

A patent has been applied for, and further development is planned for during the fiscal year 1980-81.

After enquiries from industry, based on work done in 1976 onboard two Lunenburg scallopers, the automatic rotary scallop meat washer was redesigned so that it would have wider application onboard the smaller and older wooden scallop fleet. Two drum designs have been built of polyethylene to reduce cost, and are awaiting evaluation onboard two scallopers.

DULSE SPREADER AND WASHER

The purpose of the project was to design, build, and test under commercial conditons, prototype dulse washing and spreading equipment to improve the quality of dried, finished product, and to increase production.

The equipment was constructed partially during 1978, and completed last year. Preliminary trials were carried out at Grand Manan last fall, and the results were encouraging. Further trials will take place in 1980 during the dulse harvesting season.

ONSHORE UNLOADING SYSTEMS

After a request from the Yarmouth office, assistance in designing and purchasing unloading equipment for five areas in South West Nova Scotia was undertaken. Design of a 1,000 pound capacity crane allowed local fabrication, and hence, reduced capital cost by 30%. Supervision of the installation was done by the local CSO's. Problems have been encountered with winches (lift capacities) that were originally supplied by Lunenburg Foundery. These winches have been installed, not only in South West Nova Scotia, but in other areas of the Maritimes as well.

The difficulties that were encountered are presently being corrected. Information learned from these projects will assist in future selection of port facilities.

IRISH MOSS HARVESTING PROJECT

The objective of this project was to develop a rake design that would decrease the damage to the resource without reducing present productivity. Initial designs were concluded in early summer, followed by final statistical tests in late fall. Results of these tests will be available early in 1980, with recommendations on improvements to be made this spring. This project is being carried out in conjunction with the Resource Branch.

FISH HANDLING ON INSHORE BOATS

In response to a request from the Inspection Division, a project was designed to improve the quality of fish landed by inshore boats, with significant reduction in the labor effort. Two types of designs will be demonstrated; the first design is a permanent insulated fibreglass hold (capacity 30,000 pounds) with removable working deck, enabling the owner to unload and weight his fish in any location he desires. This 55-foot boat has a boom, 16 feet off the deck which, combined with 1,000 pound net bags and weigh scale, will provide flexibility of operation. The second design consists of a smaller removable fibreglass compartment (capacity 5-7,000 pounds) adaptable for groundfish and lobster.

VESSEL DEVELOPMENT

The Branch has been involved, on a cost-sharing basis with the Province of Nova Scotia, in the construction of a 52-foot steel stern trawler. The Branch has conducted various

stability tests and studies, for example, the feasibility of aluminum inshore vessels is presently being investigated. There is also a continuing involvement with the various regulatory agencies concerned with fishing vessels. In the future, studies concerned with fuel economy and containerization of catch at sea will be carried out.

OTHER PROJECTS

The Branch has been involved with a number of small scale fishing demonstrations. One project involved the evaluation of automated Swedish fish-jigging machines in the Port Mouton area. Results from that area, as well as reports from those using these machines in Cape Breton, indicate that a definite future exists for this type of fishing. Support was given mackerel fishermen in St. Mary's Bay fishing for the first time with drift gillnets; however, because of the presence of large quantities of squid, the project was not particularly successful. Monofilament long-lining was tried in conjunction with a fishing gear importer. However, becuase of the inadequacy of present equipment to properly handle monofilament lines, the project was halted. However, it was shown that monofilaments catch two to five times as many fish per 100 hooks.

The continuing provision of technical expertise by staff is an important ongoing function of the Branch. The importance of this service must not be underestimated. A great deal of time and effort is spent providing information in response to queries from the industry as well from other Branches within the Department and from other agencies with an interest in the fishing industry. As one example, a number of requests have been received by the Engineering Division concerning the installation of RSW and CSW systems. Also, as a service to fishermen, the Branch keeps on hand a large selection of plans of various types of

fishing gear, most of which were designed by the Branch.

Branch staff are also involved in a number of programs that are not of as high profile as some others. For example, the Branch was partially responsible for the overall co-ordination of the mackerel marketing program. Branch personnel have been involved in the world wide marketing study, the recent squid seminar, as well as taking an active role in some areas of fisheries management, and serving on various committees.

SMALL CRAFT HARBOURS BRANCH

GENERAL SUMMARY

This Branch is responsible for the general maintenance and upkeep of all marine facilities, and for undertaking any new works for improvements in the Maritimes Region. These include the acquisition of property and the obtaining of leases, licenses and permits of occupancy.

The Branch expects to have spent all of its total revised budget of just over $10-million for the fiscal year ending March 31st, 1980. The money is spent funding the Harbour Development Program, in three ways: the initiation of new capital projects; the operation and maintenance of existing facilities, and the undertaking of Canada Works projects related to Harbour Development, but funded in part by the Employment & Immigration Commission.

Small Craft Harbours - Harbour Development Program
Fiscal Budget 1979-80
(in dollars)

	N.S.	N.B.	P.E.I.	TOTALS
Operations & Maintenance	1,920,600	1,156,300	688,500	3,765,400
Capital Projects	2,258,000	2,631,700	703,000	5,592,700
Canada Works Projects	261,500	314,000	157,000	732,501
				10,090,600

Other funds, separate from the regular operational budget, were approved for the Canada Works Program in late November, 1979. The projects included in this program should be completed before March 31st, 1980, because there will be no carry-over of funds.

Two additional person-years were requested and received by the Branch, bringing to nine the number of person years for this region. Staffing action has begun and hopefully interviews will be held soon for these two positions:

i) Project Development Officer (N.S.) - PM 3

ii) Harbour Administration Officer - PM 2

PROPERTY AND HARBOUR ADMINISTRATION

In 1979, the revenue for our Branch exceeded $150,000. An exercise to convert over 1,300 permits to formal licence documents was completed. An improved harbour management system was approved which will give our harbour managers (wharfingers) more authority to administer harbours. The percentage of commission and the commission base were increased to provide an increase in salaries for the harbour managers. Additional training aids were obtained to assist the harbour managers; for example, new wallets, badges, I.D. cards, portfolios, clipboards and instruction manuels. Planning is continuing for harbour management, fees, rates, reporting, revenue, recording. Our regional files were reorganized. Our summer students were successful in completing over 400 harbour site inspections. They obtained site information, plans, reports, pictures, statistical and other data on old structures for disposal purposes. Administration of waters around Fisheries facilities was transferred from MOT together with over 120 legal leases and licences. Over 80 land acquisitions were actioned in 1979. Five wharfingers retired, and seven new men were appointed.

FISHERIES AND RECREATIONAL HARBOURS ACT

Under the regulations of this Act passed on October 5, 1978, considerable correspondence, meetings and discussions

took place both in the Region and at Ottawa to formulate a new national policy for Recreational Harbours and to compile a new fee structure on a national basis, that is, the same rates would apply across the country. This matter has not yet been resolved, but hopefully, will be submitted to Cabinet for discussion early in 1980.

FIVE YEAR PLAN

On April 1, 1979, a study was initiated by the Small Craft Harbours Branch to develop a Five Year Plan for commercial fishing and recreational harbours in the Maritimes Region. This plan will recommend the level of funding to adequately maintain and improve our harbours over the next five years. Also, it will project the level of funding to respond to any different harbour needs of the fishing industry, subject to any changes in the fishing industry and technological development.

This study is nearing completion with the remaining task, in the hands of the Consultant, Beasy Nicoll Engineering Ltd., to compile the final report. The study report and regional discussion paper will be submitted to the Regional Steering/ Review Committee for approval prior to submission to Ottawa. Meetings will also be held with the Provincial Working Groups to relay results of the study and provide a general concept of program plans.

When completed, the report from the Maritimes will be included in a national report at Headquarters and then submitted to Cabinet and Treasury Board for the discussion and approval of the level of funding for the next five years. The first year of implementation would be 1981.

SUMMARY BY PROVINCES

A) Prince Edward Island

Several major Capital projects were undertaken this year including the completion of harbour improvement at Beach Point; reconstruction of 66 meters of steel sheet pilework wharf at Skinner's Pond (extensively damaged by a severe winter storm during 1977), as well as complete dredging of the harbour at Wood Islands.

Major redredging of the harbour and "run" at Naufrage, extensive breakwater and shore repairs at Rustico, wharf repairs at Skinner's Pond and breakwater repairs at Savage Harbour are some of the larger Operations & Maintenance (O & M) projects initiated this year.

In total, twelve Capital projects greater than $10,000 each were undertaken, as well as approximately 55 smaller projects valued at less than $10,000. A total of 21 O&M projects greater than $10,000 were undertaken, as well as approximately 85 smaller projects of less than $10,000.

This year wharves at Murray Harbour and Machon's Point were completed under the Canada Works Program. In December, funds were provided for fill and rip rap at Red Head, which when placed, will allow the construction of approximately 20 bait sheds under the Canada Works Program.

A consultant was appointed this year to investigate six north shore locations which have presented continual access problems. Excessive sand movement occurs, resulting in serious siltation problems at the entrance, and in channels at several harbour locations. A great deal of valuable information was gathered, and this data will be helpful in future development of these locations. The six locations are Sea Cow Pond, Tignish, Malpeque, Rustico, Naufrage and North Lake.

In May, a Program Manager was appointed for P.E.I. to deal with the future development of Small Craft Harbours locations. It will be his responsibility to ensure that the maximum benefit can be realized by the fishing industry for the dollars invested by Small Craft Harbours.

Aerial photographs were taken at 45 locations.

B) New Brunswick

Considerable progress has been made in our efforts to concentrate fishermen at suitable harbours. Fleet displacement at Blue Cove, White Head and Harshman's Brook all appear to be working quite well.

Initial efforts have been made to improve the harbour management system, and it is expected that substantial improvements will be realized shortly.

A total of 27 Capital projects and 16 Operation and Maintenance projects over $10,000 in value were undertaken during fiscal year 1979/80. Those projects considered major are listed below:

Seal Cove	Wharf Extension	$ 400,000
Shippegan	Harbour Impvts, Ph. I	360,000
Pointe Sapin	Harbour Improvements	1,000,000
Stonehaven	Breakwater Improvements	450,000
Dalhousie	Dredging	215,000

In this province, a total of $864,000 was allocated to carry out 14 Canada Works projects related to harbour developments in the province and in co-operation with the Employment and Immigration Commission.

Among the more noticeable achievements with these projects are a wharf and haulout facility at Jacquet River, breakwater at Middle Caraquet and a haulout and marginal wharf at Shippegan Gully.

A total of 150 harbours are now under the Property and Harbour Administration, with approximately 80 of these requiring active supervision. Efforts are now being made to establish port committees to assist in the daily operation of the wharves. Committees have now been established at Caraquet, Shippegan, Little Cape and St. Andrews.

C) Nova Scotia

Of the 14 new Capital projects started this fiscal year, the following were considered major.

Bush Island	Wharf Extension	$225,000
Port Maitland	Armour Stone Impvts.	80,000
Wedgepoint	Harbour Dev. Ph. I Bkwr Construction	650,000

Six other major Capital projects, which had been started the previous year, were completed.

In 1979/80, the O&M Program included 35 projects whose cost exceeded $10,000.

In co-operation with the Job Creation Branch of Canada Manpower and Immigration, seven projects were started through the Canada Works Program. Some of those deserving mention are floating wavebreaks at Yarmouth Bar, wharf extension at Marie Joseph and skidways at Lower Argyle and Skinner's Cove.

Aerial photographs were taken this year of more than 200 locations in the province. These photos have proven to be a useful tool in the planning for development of our harbours.

Efforts have been made to encourage the formation of port committees. In addition to improving our communication with the fishermen, these groups assist in the day to day operation of the harbours.

FISHERMEN'S COMMUNITY SERVICES PROGRAM

In 1979, the Program grew to include 20 male and one female Community Services Officers. They are in the communities of:

Petit Rocher, New Brunswick
Caraquet, New Brunswick
Lameque, New Brunswick
Baie St. Anne, New Brunswick
Cap Richibucto, New Brunswick
Cap Pele, New Brunswick
Cape Tormentine, New Brunswick
Dipper Harbour-Maces Bay, New Brunswick
Deer Island, New Brunswick
Grand Manan, New Brunswick
Digby Neck, Nova Scotia
Meteghan, Nova Scotia
Wedgeport, Nova Scotia
Clark's Harbour, Nova Scotia
Lockeport, Nova Scotia
Port Bickerton, Nova Scotia
Canso, Nova Scotia
Pictou, Nova Scotia
Louisbourg, Nova Scotia
Cheticamp, Nova Scotia
Tignish, Prince Edward Island

The year has been a busy one for all the C.S.O.'s since they are involved in every facet of the lives of the fishermen and their communities. As well as helping fishermen deal with the intricacies of governmental documentation, all the C.S.O.'s have been very active in the following areas: wharf and harbour improvements; Canada Works; New Horizons and other community programs, and the development of new fishing techniques. The C.S.O.'s have also served as a constant communication link between the fishermen and government.

The Program is still a pilot project, and is due to terminate in March, 1981. A review of the program is now being carried out, and the future of the C.S.O.'s beyond that date will depend upon the review findings.

RESOURCE BRANCH

The Resource Branch is responsible for a broad spectrum of scientific investigations and biological research on marine and freshwater fishery resources of the Maritimes region, and the provision of biological advice required for their management. The research and development roles of the Branch are to develop and maintain a knowledge of the fisheries resources within the region, including species interactions, environmental influences and the effects of fishing on the resource base; to develop and maintain a knowledge of the effects of contaminants and habitat alterations on the resources, and to enhance the resources wherever technically and economically feasible. Major programs of research are directed to stock assessment, habitat protection and resource enhancement including aquaculture.

During 1979, the Branch had a total full-time staff of 382 person years consisting of research scientists, biologists, chemists, engineers, technicans and including support staff located at various locations throughout the Maritimes with major components at the St. Andrews Biological Station, the Bedford Institute of Oceanography, and within the area of Halifax headquarters. Fifteen employees of the former Technology Branch, Halifax Laboratory, were transferred to the Resource Branch and their work as redirected to resource investigations.

Programs of research were conducted by the four Divisions which make up the Branch - Marine Fish, Invertebrates and Marine Plants, Freshwater and Anadromous, and Fisheries and Environmental Sciences. In addition to the activities and research of each Division, as described below, Branch staff had a deep involvement in the work of the Service, in the Canadian Atlantic Fisheries Scientific Advisory Committee (CAFSAC), in support of extended jurisdiction arrangements, in various management committees, and in support of negotiations at meetings of international commissions.

The Marine Fish Division conducted biological research and investigations to provide advice for the management of groundfish, pelagic, and marine mammal resources. Stock assessments were made on the commercially exploitable stocks in the south Gulf of St. Lawrence, the Scotian Shelf, the Bay of Fundy, and Georges Bank, and on grey and harbour seal production on Sable Island.

Major programs of research were conducted in support of stock assessment activities. An entire series of seasonal (spring, summer, autumn) groundfish surveys was initiated as part of a continuing program on the Scotian Shelf to produce details of the seasonal distribution of the different groundfish species, to refine estimates of abundance and provide a basis for future survey design. The expansion of groundfish surveys has not yet hand an impact, but the historical data series have become the cornerstone of groundfish stock assessments because of the quality of commercial catch/effort data. Pelagic survey development was postponed because of staff vacancies, but development and evaluation of acoustical equipment and data interpretation progressed. Acoustic techniques are likely to provide the basis for a pelagic survey program, the objective of which is to provide independent estimates of pelagic abundance for stock assessments. The annual groundfish survey in the southern Gulf of St. Lawrence was completed A survey of the Bay of Fundy - Scotian Shelf area in conjunction with the herring larval survey program, confirmed what had been suspected that the 1976 year-class of herring was very large. The spring survey of the spawning haddock population in the Emerald-Browns Bank area was maintained to monitor the effect of closures during the spring spawning season.

On shore, biological sampling of domestic catches has been increased, but the distribution and number of samples are still considered inadequate for stock assessment requirements. Biological sampling at sea by observers on foreign vessels has provided essential data for the assessment and management of silver hake

and squid fisheries. The international observer program has provided bycatch data which strongly supported the nypothesis that small-mesh fishery bycatches were the primary cause of the recruitment collapse in Scotian Shelf cod and haddock stocks, and this allowed adoption by fisheries managers to a less restrictive management regime. Although the impact of historical small-mesh fisheries on the Scotian Shelf cannot be resolved retrospectively, the inferences which can be drawn from this project are puttting a new perspective on the potential of traditional groundfish resources. The Division's system of editing, auditing and computerizing Bay of Fundy herring catch statistics was judged to be excellent, and became the official Departmental statistical reporting system after its development in support of the Bay of Fundy Herring Project; it continues producing high quality fisheries data. The statistical audit function was developed in relation to the large scale misreporting of domestic groundfish catches by area and species, but the function must be improved for stock assessment purposes.

The Scotian Shelf Ichthyoplankton Program, which is designed to investigate the factors controlling year-class strength in fish stocks, continued in 1979, and the first output stage, species distributional analysis, was reached. Data collections for all phases of the program are progressing well, and the sorting and identification contract with Marine Research Associates (subcontractor, Huntsman Marine Laboratory - for detailed sorting of speciments) was signed for a five year period.

An increased emphasis was placed upon groundfish and herring tagging programs to assist in defining stock units and their mixing, and migration routes. Tagging operations for groundfish were quite successful, involving 6,000 cod in NAFO area 4VsW; 4,000 cod in 4T; 4,000 American plaice in 4T; 200 white hake in 4T; and approximately 10,000 pollock in 4WX. The purpose of these groundfish tagging programs is to determine the relationship

between cod on Middle Ground vs cod from inshore areas and Banquereau Bank; the relationship between the various summer cod fisheries in the Gulf of St. Lawrence and the winter 4T - 4Vn fishery; the movements of white hake and American plaice in the Gulf, and the relationship between pollock on the Scotian Shelf vs the Gulf of Maine area. Data obtained during the pollock tagging operations, and follow-up biological studies on growth and distribution, suggest that pollock may spawn on the Scotian Shelf as well as in the Gulf of Maine area. If confirmed, the stock definition and current management regime for pollock must change. Ten thousand herring were tagged in Liverpool Bay; 10,000 in the Digby area, and for the first time, 10,000 in the 4Vn area during December. The purpose of the herring tagging program is to provide a better understanding of the stock structures of the different herringpopulations in the Maritime area. At present, the relationships between herring stocks is poorly understood. For instance, herring in the Gulf of St. Lawrence spend the winter off southwestern Newfoundland; some spawn around the Magdalen Islands in the spring, while others spawn around the Gaspe in autumn, and spend the summer spread out in the southern part of the Gulf of St. Lawrence. Some herring found in the Bay of Fundy during summer spend the winter off Chedabucto Bay (a distance of about 350 miles) while others migrate south to Cape Cod for the winter. We do not yet know where the herring caught during the winter in Sydney Bight migrate during the summer.

The Invertebrate and Marine Plants Division conducted biological research and investigations to provide advice for the management of offshore and inshore molluscs, crustaceans, and marine plants. Stock assessments and associated biological research on invertebrate resources were primarily directed to squid, scallops, oysters, soft-shell clams and lobsters.

Research conducted on squid (Illex illecebrosus) provided the basis for scientific advice to CAFSAC and STACRES Committees and Fisheries Management on subjects such as abundance, distribution, mesh selection, food and feeding behaviour, and spawning. The data were collected on joint cruises with the U.S.S.R. and Japan. Personnel also partipated in a five-month squid jigging program with Fisheries Development Branch personnel. These programs have permitted the build-up of a much needed data base on the biology and distribution of squid on the Scotian Shelf. For example, plankton surveys resulted in the first in situ siting of larvae and juveniles which permitted the complete description of the squid's life cycle. An ongoing joint study on the biology of squid with scientists from Dalhousie University has provided the description of eggs, egg development, larvae, and mating behaviour for the first time. The basis of a fisheries model was constructed with the accumulation of biological data on growth, food consumption, and nutrition.

A fisheries log system, introduced into the Northumberland Strait scallop fishery, has made available for the first time catch and effort information as to area fished. Gear performance and predation studies were also carried out in this area. Development of stock assessment techniques and scallop yield studies were continued and the port sampling program in southwest Nova Scotia was expanded. Two cruises were made on commercial vessels to gather research data in the Georges Bank area with emphasis on the uptake of water by scallop meat during at-sea holding. Resource surveys were conducted in Northumberland Strait, off Grand Manan Island, and on Browns and German Banks. Crustacean predation of commercial-sized scallops was investigated in Northumberland Strait.

Oyster research and enhancement programs in New Brunswick and Prince Edward Island included bottom cleaning to improve spatfall, and provision of spatfall monitoring and production

services. Stock and population structure studies were conducted in Caraquet Bay. Port sampling of oyster landings was carried out on the east coast of New Brunswick. A joint federal/provincial development project was developed and initiated in the Caraquet Bay area to improve spat survival, increase production from private leases, and to transfer oyster culture technology to the private sector. Modernization and computerization of the shellfish leasing system was continued. An update and review of the Shellfish Leasing Policy was carried out.

Stock assessments of clams were made off Prince Edward Island to determine the recovery rate of harvested flats. Studies on the long-term effects of hydraulic harvesting continued in Fortune Bay, P.E.I. It was determined that the minimum spawning size of soft-shell clams was 38 mm in the southern Gulf of St. Lawrence.

Lobster larval surveys off southwest Nova Scotia have shown that early as well as late stage larvae are found both offshore (Browns Bank area) and inshore. Since surface currents in this area flow generally shoreward, some contribution of larvae from offshore to inshore areas is likely. Previous tagging of adult lobsters in July and August has shown a small percentage interchange between the Seal Island and Browns Bank areas, with most of the movement being outward. To test whether this outward movement is part of a summer-in and fall-out seasonal pattern, as opposed to a gradual emigration of a small portion of the inshore stock, further tagging was made early in spring in offshore and distand inshore areas before any summer-in movements take place. Recent studies along the New Brunswick shore of the Bay of Fundy have demonstrated a shoreward movement of females in the summer.

A survey of the lobster populations in the upper Bay of Fundy was initiated, and 10,000 lobsters were tagged to determine growth, movement, and exploitation rate. The evidence to date indicates that during summer (June-September) many large,

mature lobsters over 1.5 lbs. move from the deeper, colder water to shallower, warmer water for moulting and reproduction. Much of the New Brunswick coastline from Grand Manan Island up to Chignecto Bay may be an important area for large, mature females hatching ripe eggs into free swimming larvae, and extruding new eggs during summer. For example, up to 70% of the total female lobsters of 95 mm in carapace length, trapped in early September in the Chignecto Bay area, were berried. In the same area in May and November, less than 10% of the females were berried Many of the females with newly extruded eggs probably move back into the deeper waters during the winter months. A few tag returns have indicated lobsters moving from Alma and Chance Harbour to the deeper waters off Grand Manan Island.

Two surveys of lobster populations, in the southern Gulf of St. Lawrence and off eastern Nova Scotia, were continued with recoveries of tags released in 1978. The data based on growth, maturity, migration, and temperature has been expanded. These data have been incorporated into yield-per-recruit and stock-recruitment models for these populations.

Stock assessment for management purposes in Lobster District No. 8 (western Northumberland Strait) was further enhanced with the establishment of a district-wide port sampling program which produced catch and effort data on a weekly port-by-port basis. This constitutes a significant addition to a management program designed to address the serious yield and recruitment problem in this fishery, and serves as a pilot program for other districts.

Snow crab stock assessments were made in eastern Cape Breton, which included tagging to determine exploitation rates and movements. A preliminary survey for jonah crabs on Roseway Bank showed no commercial concentrations during the period of February to May.

Two shrimp surveys were completed. Off southwestern Cape Breton, in the developing fishery, the stock is estimated at 8000 to 12000 MT. No shrimp stocks were found off the south shore of Nova Scotia. Studies on fecundity, growth, and improved age-class separation were initiated.

The ecological impact and productivity of both the traditional Chondrus dragrake, and seven experimental dragrakes were assessed. Significant differences were noted between them. It was found that the wider the tine spacing, and the higher the tines off the bottom, the greater the adverse ecological impact (incidence of both immature fronds and fronds attached to holdfasts was greater). The dragrake with the narrowest (5 mm) tine spacings yielded the greatest productivity and the lowest ecological impact. A study in Chondrus beds off both Miminegash and Borden, P.E.I., showed that the Miminegash beds were rockier than those off Borden and had considerably more lobsters, and that the impact of Chondrus harvesting on lobsters off Borden was negligible. It was shown in District 12 (southwestern Nova Scotia) that Chondrus dragrakes disrupt the drumlin substrate. The second year was completed of a three-year study designed to determine the appropriate handrake tine spacing and harvesting strategy which would give optimum sustainable yield for Chondrus harvesting in District 12. Harvest effort per bed in Districts 1, 2, 6, and a portion of 12 were determined. Effort in District 1 increased by approximately 45% over 1978.

A study was undertaken to determine the quadrat size which is both most efficient and accurate with which to assess Chondrus standing crop in the southern Gulf of St. Lawrence. As well, a study was undertaken using random samples to determine both the approximate sample size and time required to carry out an accurate biomass assessment in Gulf Chondrus beds.

It was shown that 75% of the macroalgal biomass in District 12 (southwestern Nova Scotia) is comprised of four commercially important species. A program is in progress to determine what percentage of this biomass is important in the food web leading to the commercially important carnivores.

The Freshwater and Anadromous Division conducted biological research and investigations to provide advice for the management and enhancement of the freshwater dependent fishery resources in the region. Atlantic salmon activities include the continual monitoring of juvenile and adult populations in three major New Brunswick rivers - Restigouche, Miramichi and Saint John, and in selected rivers in Nova Scotia. Salmon stocks are continuing to improve in New Brunswick and preliminary stock assessment forecasts indicate a limited surplus for harvest in the three major river systems. Investigations on Nova Scotia rivers show that juvenile salmon populations are well below the estimated potential level and that exploitation must be reduced for stock recovery to take place.

Salmon production at the twelve hatcheries operated by the Division generally exceeded production targets but budgetary constraints forced a reduction in the number and size of trout reared. Over 500,000 salmon smolts were released, and 800,000 salmon fingerlings were distributed to various rivers and streams throughout the Maritimes region. Speckled trout production for a put-and-take fishery near urban areas, for maintenance and supplementation of native populations, and for provincial requirements, exceeded 900,000 fingerlings and 35,000 yearlings. Smaller numbers of rainbow trout and landlocked salmon were reared for specific projects. A large proportion of the salmon released were marked or tagged in order to learn more about their migration patterns, distant exploitation, and their

contribution to fisheries and to the spawning escapements.

Studies related to fish physiology included water quality assessments in several Nova Scotia rivers. Water chemistry of the Mersey River, and local precipitation were monitored to assess the impact of the long-range transport of pollutants. High acidity levels of the water supply to the Mersey fish culture station limited fry survival rates in previous years, to a maximum of 47%. The use of a calcium carbonate buffer was made in 1979 to increase pH levels, and fry survival to the smolt stage is now estimated to be 65%. Laboratory diet studies on Atlantic salmon juveniles resulted in production of a feeding chart, enabling significant food savings to be achieved through control of hatchery water temperatures.

Engineering activities were involved mainly with enhancement projects, and personnel worked in close association with consultants in the development of proposals. These included a detailed design of a new hatchery capable of rearing 500,000 smolts; studies to confirm an adequate supply of good groundwater at another site; the design of a proposed fishway on a New Brunswick river, and the assessement of the proposed use of solar power for space heating at two fish culture stations. Other activities of staff included the construction of brood holding ponds at Coldbrook; design of a replacement dam for Cardigan water supply; plans for a security monitoring system at Mactaquac; maintenance and repairs to fishways, and reconnaissance surveys of barriers to identify potential enhancement opportunities.

Specialized biological and engineering inputs to protect the fish habitat involved a wide range of tasks. Mitigation measures to protect fish habitat were developed for 431 proposed watercourse alterations. Guidelines were prepared for an environmental assessment study on a project to improve drainage of agricultural land at Lawrencetown, Nova Scotia, and an evaluation

was made of an environmental impact statement on the effects of a proposed natural gas pipeline. Considerable effort was assigned to fish passage studies at various existing dams and fishways. These included the formulation of designs to improve alewife passage at Tusket Falls, Nova Scotia, and at Bell's Pond, Prince Edward Island. Improvements were undertaken to the Magaguadavic River fishway. Experimental devices at the East River dams improved the downstream passage of smolts, and sonic tagging studies were continued in the East River estuary to assess the upstream fish passage facilities. In order to ensure that existing fishways are maintained in good order, a fishway inventory and annual inspection system were planned and instituted. Functional engineering fishway designs were prepared for use in 16 development projects initiated by outside agencies. Modifications, improvements and maintenance were carried out on several Department-owned fishways.

A significant effort was expended in 1979 towards the preparation of the "Salmon Blueprint", including the development of a plan for salmon enhancement in the region.

The Fisheries and Environment Sciences Division is responsible for solving fishery resource problems that transcent the species-oriented organization of the Branch. The Division also has responsibility for administering the St. Andrews Biological Station, and providing administrative, technical and scientific support services for all Resource Branch staff located there.

In the area of fisheries research, programs were directed to studies of fish physiology and culture, invertebrate physiology, and disease and nutrition.

Fish physiology and culture - both sea ranching and cage culture continued to appear promising as aquaculture strategies in the production of large sized Atlantic salmon. Salmon were

successfully cage-reared to market size (7.5 lbs) on Deer Island, New Brunswick, under contract to Research and Development. The size was attributed to the fact that fish did not mature sexually thus directing energy into growth. The Salmon Genetics Research Program has yielded data on the success of various stocks raised under sea ranch conditions, and provided data on the genetic and environmental aspects of juvenile growth, and on the precocious sexual maturity of male parr.

Invertebrate physiology - a maturity profile for lobsters from the southern Gulf of St. Lawrence and Bay of Fundy was formulated, and several new methods were developed for determining maturity of male and female lobsters and assessing the degree of reproductive capability. In addition, 30,000 lobsters were hatched in the lobster culture facility, and techniques were developed for producing larvae year-round, for increasing both larval and post-larval survival, and for enhancing growth and survival of lobsters held in communal tanks.

Disease and nutrition - nutritional studies related to bacterial kidney disease showed that the incidence in salmonids could be reduced by supplementing diets with iron, copper, zinc, cobalt, maganese, iodine and fluorine or by reducing the calcium level in the diet. Evidence indicates an interaction between the dietary mineral levels and the mineral content of supporting water bodies.

An extra-cellular toxin, elaborated in culture by Labyrinthomyxa sp., the recently isolated agent involved in Malpeque disease of oysters, has been characterized. The toxin is believed to be related to the pathogenecity of the organism, because of the histopathology observed in the infected tissue.

The Fish Health Unit has isolated and characterized the causatine agent of "saddleback" disease, responsible for mortalities at the Mactaquac fish culture station.

The antibiotic sensitivity of the disease agent, Flexibacter columnaris, has been determined, and vaccination trials are in progress.

The Fish Health Unit issued 24 import permits, established quarantine units, certified broodstock and fish holding facilities, and investigated fish kills throughout the Maritimes.

In the area of fisheries Environmental Sciences, programs were directed to environmental research, applied ecology, and environmental coordination.

Environmental research - nonylphenol of the pesticide formulation used against spruce budwork in eastern Canada was shown to pose an unnecessarily increased hazard to fisheries. This solvent was shown to be more toxic to salmon than the active ingredient, matacil.

Research continued on contaminant levels in commercially important marine fisheries: - The sublethal effects of polychlorinated biphenyls on cod reproduction were determined.- The uptake of cadmium by benthic fauna from contaminated sediments was shown to proceed in two stages: desorption into water and uptake from water. This concept probably applies to other contaminants as well and is important for the assessment of hazards associated with contaminated sediments, dredging, and dredge spoil dumping. Preliminary baseline data on contamination of marine benthic fauna were obtained by Chedabucto Bay and Miramichi estuary. These data are needed for the assessment of the impact of industrial activities and dredging respectively. - Uptake and excretion patterns by fish of four flame retardants of the dechlorane series were determined. These data are needed for environmental hazard assessment. - Uptake and retention of Gonyaulax toxins in zooplankton were demonstrated and preliminary data were obtained on their toxicity to larval fish. The scientific response to the Kurdistan oil spill was coordinated by Division staff, and a large number of samples of shellfish

was analyzed for contamination by oil.

Applied ecology - a study of long-range transport of atmospheric pollutants has shown that low pH is most damaging to young salmon at the alevin and fry stages. Acclimation to low pH does not increase the resistance of salmon to low pH. Acid water can inhibit egg hatching if eggs are exposed in later stages of development.

Cadmium in the lobster digestive gland does not appear to be as readily assimilated by experimental animals as other forms of cadmium and may be less hazardous to humans than previously thought. Baseline ecological research was conducted in the upper reaches of the Bay of Fundy to provide a biological base to assess the fisheries implications of Fundy Tidal developments.

Environmental coordination - analysis and assessment of 107 ocean dumping applications and 112 land-based industrial proposals were made which included projects such as the development of strategic oil and gas storage reservoirs in New Brunswick and Nova Scotia salt domes. Also included was a major review of the Miramichi channel dredging proposal and reviews of formal Environmental Impact Statement reports.

Major efforts were devoted to the Kurdistan oil spill, the Eastport oil refinery proposal and a variety of other issues of ecological significance such as nuclear power, tidal power, forest spraying, and offshore hydrocarbon development.

PROGRAM PLANNING AND COORDINATION BRANCH

The Branch, with an operational budget of $150-thousand and a staff of twenty-three employees, is responsible for developing and assessing policies and programs for the Region. To accomplish these objectives the Branch is divided into two divisions.

PLANNING AND POLICY RESEARCH DIVISION

A major activity of this division is the stimulation and coordination of planning related to fisheries. This includes the provision of background policy research, and the preparation of statistical and other information relevant to Maritime fisheries management such as the publication of articles in international journals. In 1979, the division conducted or directed several internal economic studies, including: the possible implementation of the Canada/United States Fisheries Agreement; the impact of vessel subsidies, and studies on specific fisheries.

ECONOMICS DIVISION

This division, comprising three units, participated in the formulation of general policy such as the review of Canada's commercial fisheries policy and, in specific, policy areas such as commercial and recreational salmon fishing. The Branch was involved in consultations with industry on specific fisheries and on international negotiations. It also provided assessments of public investment proposals, and various programs and policies, as well as providing statistics on landings and vessel performance.

In 1979, the Public Investment Unit reviewed out 39 DREE proposals for processing, and 12 proposals concerning harbour infrastructures. In addition, the unit provided input into a major study on harbour investment, and represented the Department in a study of fisheries industrial parks in Nova Scotia. This year also saw the initiation of discussions on Fisheries Sub-agreements for New Brunswick and Nova Scotia.

The Socio/Economic Unit provided input into a number of program evaluations, initiated a vessel performance study, and responded to various requests for data and information on fisheries matters. The unit also administered the lobster buy-back and salmon compensation programs, as well as co-ordinating regional involvement in marketing programs and international negotiations. In 1979, the unit participated in a worldwide fisheries marketing study, and represented the region at various Canada/United States negotiations concerning boundary and fisheries agreements.

The Statistics Unit initiated several improvements in the processing and dissemination of fisheries statistics. A pilot project that provided cards and imprinters in order to record base data at the time of sale, has proven successful, and will be implemented in all areas in 1980. The Statistic Section assumed responsibility, in January 1979, for the collection, tabulation and presentation of statistics for quota monitoring. Section staff worked on inter-regional committees which greatly improved the coordination of statistical collection and processing between the three Atlantic regions. Results of this work included the development of new fishing zone charts and offshore fishing logs.

SUPPORT SERVICES BRANCH

The Support Services Branch, with a staff of 207 and a total budget of nine million, is responsible for providing a broad range of internal services to the remainder of the departmental staff. These include financial management, vessel operations, administration, property management, computer services and, externally, public information. All staff are located at the regional headquarters in Halifax.

The Ship Division began 1979 with all three major patrol vessels double crewed. The overall vessel performance compared to 1978 showed:

	1978	1979
Total sea days*	540	619
Total operational days**	710	828
Total miles steamed	106,000	121,338

* Sea days = total hours actually at sea divided by 24. The vessels were actually at sea for all or part of some 712 calendar days.

** Operational days = total hours the ship is at sea, at anchor ready to go on 30 minutes notice, or alongside ready to go in one hour or less with full crew aboard.

The CHEBUCTO, with 257 sea days and 287 operational days, has set a regional record for performance. The CYGNUS, with 45,104 miles steamed, has set a regional record for miles steamed in a year, and the LOUISBOURG, with an increase of nearly 50% in performance over last year, has shown greatest improvement.

The E.E. PRINCE has also set a record for performance this year. In 1978, she was available for scientific work for 265 days, and at sea for all or part of 195 days. In 1979, she was available for work 272 days, and at sea for all or part of 226 days.

While the staff workload remained high in 1979, the major effort was placed on analyzing the cost effectiveness of double crewing and the increase in patrol capability. Input into the Stolee report on ship support costs and performance has been the principal analytical effort, and an in-house ten-year summary of cost versus performance is virtually complete.

The Search and Rescue contribution of the three major patrol vessels has grown as follows:

1976	-	12 incidents	1978	-	23 incidents
1977	-	24 incidents	1979	-	61 incidents

The Administration Division carried out its regular purchasing and supply services throughout the year, and was heavily involved in checking and accounting for inventory items related to the organizational changes which resulted in the creation of the Fisheries Development Branch and the discontinuance of the Technology Branch.

A disastrous fire at our laboratories at the Bedford Institute of Oceanography in Dartmouth, N.S. resulted in a loss of approximately $500,000 in government equipment and personal effects of our staff. This division provided assistance to managers and individuals in the preparation of submissions to the Treasury Board for the replacement and/or compensation for items lost.

Assistance was provided to managers in organizing the Youth Job Corps Program throughout the region. A total of 176 unemployed youths and students were hired for 4,318 weeks at a total expenditure of $643,360. The program was well received by our field staff, and the surveys carried out by the teams supplied very useful information in each area.

A car pool of department vehicles was established in the Halifax area for our large regional headquarters staff. The car pool has proved to be very successful, and efforts will be

made to increase the number of vehicles in the pool in order to further improve this service.

The Financial Management Division completed the reorganization which had started in 1978, allowing it to provide managers with improved information on their use of financial resources.

The division resolved the audit comments which had been made on the administration of the groundfish assistance program which had terminated in 1978.

The Facilities Management Division corrected the structural and other problems of the Yarmouth building noted in the 1978 annual report. The warranty period for the Fisheries office building in Sydney was completed without any significant failure or need for alterations.

Our property survey program has been completed, although final maps showing the property lines of all our major property holdings have not as yet been finanized and turned over to us by the Regional Surveyor (EM & R).

During the past year, the Technology Laboratory property came under the control of the Facilities Management Division which decided to consolidate this property with that of the Fish Inspection Laboratory. The two properties now operate as one unit called the Halifax Fisheries Laboratory. The long-term use of these facilities is being reviewed, and this is expected to continue in 1980.

Leases on our accommodations for office staff in Halifax have been extended to June 1st, 1980. It is expected that by that date, all office staff will have relocated to new quarters in the Halifax-Dartmouth area.

The Information Division in 1979 produced a 137-page "Fisherman's Information" booklet - 15,000 English, 5,000 French. This publication was widely distributed throughout the department,

to fishermen and fishermen's organizations, processors, allied provincial and federal departments, media, libraries and interested persons and organizations. As well, the 1978 annual report, in both official languages, was coordinated and widely distributed. Three "Media Information Days" were also organized and held in Halifax, Moncton and Charlottetown at which the Director-General, Directors and Area Managers met with media representatives. Reports were tabled, policies explained and question entertained. Wide coverage in the printed and electronic media was gained. Some 100 news releases were composed and edited and distributed to a mailing each time of approximately 500. Each month 1,200 copies of Fisheries and Oceans News from Ottawa was distributed through the Division. As well as a dozen items and articles were contributed to this news letter.

The Information Division also planned and provided three exhibit booths utilizing enlarged photographs, text panels, rear screen audio visual presentations, live speciments and literature - a 20' by 10' at Shediac and Shippegan and a 45' x 12' at the Nova Scotia Fisheries Exhibition, Lunenburg. Assistance was also given to the P.E.I. area for an exhibit booth in Charlottetown. Also during the year 11 news conferences were organized for Ministers, Assistant Deputy Ministers, Director-General, Directors, and other senior officials. A great number of individual interviews were also arranged as a result of media requests. Some 20 articles and information items were also solicited and edited for publications or as fact sheets and Fishermen's Information papers. The Information Division assisted in the production of three slide and audiscan productions as well as a 30 minute 16mm film production "The Atlantic Salmon" to be released in the very near future. Information's film library also circulated 100 films to the field during the year, 50 audiscan tape lectures and 200 slides for showings. Nearly 1000 written requests for fisheries information were also satisfied.

The Computer Services Division, which was formed in 1978, provides computer services to the entire region. An increased awareness by managers of the services that the Division provides, has resulted in a significant growth in the identification of problems the computers may help to solve.

The response to these inquiries and the planning for future demands on our computerized systems has necessitated a detailed review of our computing capability. This review will continue in 1980.

PERSONNEL BRANCH

The new Regional Personnel Organization for Fisheries and Oceans, Maritimes has a total yearly budget of $48,000 and a staff consisting of 20 person/years.

With the split of Fisheries and Environment, the Personnel Branch was divided in half, and underwent a major re-organization in both new departments. The re-organization required the division of personal history records, files and paylists between the Department of Fisheries and Oceans and the Department of Environment.

1979 saw the finalization of reclassification of the District Protection organization, involving approximately 325 positions with the resultant adjustment and verification of salary, as well as re-computation of overtime credits over the retroactive period.

In the area of Staff Relations, finalization of special working arrangements, in consultation with two major unions to provide a multi-tasking role for three inshore fishing patrol vessels, was mutually agreed upon. Other major developments in Staff Relations included: participating in the updating and re-negotiation of the General Technical collective agreement; updating and revamping the Fisheries Grievance Procedures; involvement in several discipline cases, and conducting Staff Relations training courses at Dartmouth and St. Andrews.

A major recruitment campaign for Fishery Officers, in the spring of 1979, resulted in the hiring of 30 new trainees for the Field Services Branch. The Career Oriented Summer Employment Program (COSEP) offered employment to 148 students for the summer period. The Staffing section was also heavily involved in attempting to place 23 employees of the Halifax Laboratory who were laid off. The special effort that was undertaken was very successful, and of the total number laid off only three have not been placed at this time.