CANADA

DEPARTMENT OF FISHERIES

1949-1950

Twentieth Annual Report

Being the Eighty-Third Annual Fisheries Report of the Dominion

To His Excellency Field-Marshal The Right Honourable Viscount Alexander of Tunis, K.G., G.C.B., C.S.I., D.S.O., M.C., LL.D., A.D.C., Governor-General and Commander-in-Chief of Canada.

May It Please Your Excellency:

I have the honour herewith, for the information of Your Excellency and the Parliament of Canada, to present the Twentieth Annual Report of the Department of Fisheries, being the Eighty-Third Annual Fisheries Report.

Respectfully submitted,

R. W. Mayhew

Minister of Fisheries.

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To The Honourable Robert W. Mayhew, M.P.,
Minister of Fisheries,
Ottawa, Ontario.

Sir:

I have the honour to submit herewith the Twentieth Annual Report of the Department of Fisheries, which covers the fiscal year 1949–50 and is the Eighty-Third Annual Report on the fisheries of Canada.

Your obedient servant,

Deputy Minister.

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THE DEPARTMENT AND ITS RESPONSIBILITIES

THE Government of Canada is responsible for the conservation, development and the general regulation of the nation's sea coast and inland fisheries. This responsibility, vested in the Minister of Fisheries, has increased substantially over the years with the expansion of the fisheries industry and the growing importance of the products as a source of high protein food for domestic and world consumption.

To discharge these responsibilities in the best interests of the country as a whole the Parliament of Canada placed at the disposal of the Department of Fisheries of Canada in 1949–50 appropriations of $9,103,590. How these funds were used is found in detail in the financial statement published as an appendix to this report.

With fisheries, as with other natural resources capable of self-perpetuation, conservation is of prime concern. This problem calls for much biological research and, accordingly, biological stations are maintained on the Atlantic and Pacific coasts and inland, and are staffed with scientific personnel to provide all kinds of knowledge of fish populations and their movements. The Government of Canada has, in addition, many regulations designed to protect the fish, and these regulations are enforced by the Department's protection services which are made up of patrol fleets, fishery officers, wardens and guardians. Personnel of the protection services form the largest single part of the Department's staff. Along with the protection services go the development services, which look after stream clearance, design and construct fishways, maintain fish hatcheries and plant stocks.

All of these services, of course, are aimed at providing food. This has to be of good quality, and so the Government has fish inspection legislation which is also administered by the Department of Fisheries. Such a perishable product as fish requires careful handling and, accordingly, there are fisheries experimental stations on both coasts searching for improvements in the handling, production and transportation of fish and its numerous by-products.

To carry out these and other responsibilities there are three agencies under the Minister of Fisheries:

1. The Department of Fisheries proper, with headquarters at Ottawa and area offices under Chief Supervisors at Vancouver, Winnipeg, Halifax and St. John's.
2. The Fisheries Research Board of Canada, with headquarters at Ottawa and four biological stations, three experimental stations, and several small sub-stations across Canada.
3. The Fisheries Prices Support Board, with headquarters at Ottawa. This Board is concerned with the problems of fishermen in the event of falling prices.

The fishing industry of Canada takes from the sea and the inland waters nearly two billion pounds of fish each year. Approximately one-third is produced by Newfoundland, another third by the Maritimes and Quebec, and the remainder by the inland provinces and British Columbia. The marketed value of the fisheries of all Canada in 1949–50 amounted to approximately $166 million—a very decided increase over the marketed value of the fisheries (exclusive of Newfoundland) just ten years ago when it was estimated at only slightly more than $40 million. The wide dispersion of the industry and the fundamental necessity of conserving for the good of all a bountiful natural heritage of great economic value, account for the wide distribution of the Federal fisheries services.

Administrative Responsibilities

Making fisheries regulations is one thing; administering the fisheries is another. Although the British North America Act gave full legislative responsibility for the regulation of fisheries to the Government of Canada, in the years following Confederation certain administrative responsibilities were delegated to the provinces in varying degrees. Consequently, while all fishery regulations are made at Ottawa, the job of administration (enforcing the laws and regulations, inspecting fish products, issuing licences, etc.) is carried out in some cases by federal officers and in others by provincial officers, according to the administrative arrangements made with the different provinces. There is no duplication of staffs in any province.

Specifically, all tidal or sea fisheries, except those of Quebec, are administered by the Department of Fisheries of Canada, but some of the freshwater or non-tidal fisheries are administered by the provincial departments. In the Yukon, Northwest Territories, Nova Scotia, New Brunswick and Prince Edward Island, freshwater fisheries are all federally administered.

Entry of Newfoundland

The entry of Newfoundland into Confederation on March 31, 1949, brought new responsibilities to the Department and had an important effect on the status of the commercial fisheries in Canada's economy.

Under the terms of Union, and by special constitutional arrangement, the Department extended its services to the new Province. Certain Federal statutes, under which the Department functions, were proclaimed in force in Newfoundland. These were the Department of Fisheries Act, the Fisheries Research Board Act, the Fisheries Prices Support Act, the Canadian Fishermen's Loan Act and the Deep Sea Fisheries Act. As soon as possible following amendment to fit Newfoundland conditions, the following Acts will come into effect in the new Province: the Fisheries Act, 1932, the Fish Inspection Act, the Meat and Canned Foods Act (as it relates to fish canning), and the Customs and Fisheries Protection Act. The Department appointed a Chief Supervisor for the Newfoundland fisheries and established an administrative division at headquarters in Ottawa, headed by a Director.

Prior to Confederation, a controlled system of fish marketing was operating in Newfoundland under the Newfoundland Fisheries Board. Under the Terms of Union it was arranged that the powers of this Board, insofar as they relate to

the control over the export marketing of salted fish, would be continued for a period of five years after Union, unless sooner revoked by Parliament with the consent of the Provincial Government of Newfoundland. While the Board continued to operate along established lines, it became responsible to the Government of Canada, which in turn assumed the cost of the Board's operations.

Development Programme

In December, 1949, the Government announced a development programme applicable to the fisheries throughout Canada. This programme was based on plans to increase scientific research and facilitate practical application of research findings; to extend conservation and development activities through planned biological-engineering projects; to institute economic studies; to expand inspection services and encourage greater consumption in Canada of fish products; to study means of extending capital assistance for industrial expansion, and to develop a greater understanding of the importance of the resource and the industry in the social and economic life of the country. A study of methods to develop export markets, as well as to encourage international policies designed to protect the fishery resource, were to be included in the programme. The programme in general was to be applied as quickly as additional reorganization of the Department could be achieved and suitable trained personnel could be brought into the service.

The programme itself was the culmination of many months of consideration and of numerous discussions with all sections of the industry during the period from May, 1949, when the preliminary announcement was made of what the Government was prepared to undertake, to December, 1949, when its terms were outlined. The Minister of Fisheries, accompanied by the Deputy Minister and other Departmental officials, visited all provinces and discussed the project with representatives of provincial governments, management and fishermen. These meetings were climaxed by a general meeting of the Fisheries Council of Canada at Ottawa in September. At that meeting the industry, through the Council, presented to the Department its views and recommendations on the national aspects of the development plan. A better understanding of the problems peculiar to each region and the remedial measures needed was reached at that time and a new feeling of confidence in the future stability of the industry was kindled.

Following the official announcement in the House of Commons of the programme, the Department took steps during the remainder of the fiscal year, 1949–50, to lay the groundwork for a reconstituted Departmental organization which would be necessary to carry out the new responsibilities. As a result, preliminary plans were made for administering the Department on a functional instead of a straight geographical basis and forming new services from the former elements. These were to be a Conservation and Development Service, an Inspection and Consumer Service, and a Markets and Economics Service, all to be established during the fiscal year 1950–51. The other headquarters' services—Administration, Information and Educational, Legal, and the Newfoundland service—would complete the organization of the Department at Ottawa. Plans also went forward to reconstitute the Department's field organization, particularly in the Maritime Provinces where separate conservation, inspection and administrative services were to be established.

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International Activities

International activities undertaken by the Department in connection with the conservation of fishery resources included the placing before Parliament of the International Northwest Atlantic Fisheries Treaty for consideration. The Treaty was signed in Washington, D.C., on February 8, 1949, with Departmental officials representing Canada at the conference and the subsequent signing ceremony.

Meetings were held in Ottawa with representatives of the United States State Department and the Fish and Wildlife Service on matters pertaining to fisheries of concern to both countries. Other meetings were held with the International Pacific Salmon Fisheries Commission and the International Fisheries (Halibut) Commission.

In the Fall of 1949 the Department instituted the first of annual meetings with its Chief Supervisors and Departmental heads. The meeting, which was held at Ottawa, permitted a review of Departmental work and a study of plans for future activity.

Educational Programme

The Department realizes that development of the fishery resource, expansion of the industry, betterment of the quality of all fish products, and improvement in transportation, warehousing and retail facilities are essential preliminaries to increased domestic and export utilization of marketed products. Canada can hardly be described as a fish eating country. With a population of nearly 14 million people its annual fish consumption amounts to barely 12 pounds per capita. There is no doubt that the Canadian market, therefore, is capable of great expansion.

Increased fish consumption at home, along with increased sales to the North American market generally, could give to the industry as a whole a continuing, stabilized prosperity and remove many of the economic and social disturbances that have been characteristic of the past.

Accelerated efforts, therefore, were made to increase the Department's educational programme to teach consumers the best that is known in fish buying and fish cooking. For this purpose an experimental kitchen was installed in the West Block of the Parliament Buildings at Ottawa. This kitchen, in which recipes are tested and developed, and in which fish cooking demonstrations are also given to specialized groups, is the headquarters of a staff of trained home economists. As the work of consumer education proceeds, these home economists will travel throughout the country giving demonstrations and lectures on fish cookery to women's groups, schools and institutions. Early in 1950, as a start, a series of fish cookery demonstrations was held at Fredericton, N.B., at the time of the fourth annual East Coast Fisheries Conference.

During 1949–50 the Department extended its programme of general public information and education. Through its Information and Educational Service, it developed special exhibits which were displayed at the Pacific National Exhibition, Vancouver; the Canadian National Exhibition, Toronto, and the Nova Scotia Fishermen's Exhibition, Lunenburg. Displays were also made for exhibitions at St. John's and Cornerbrook, Newfoundland. New consumer aids, including a fish cookery leaflet, were developed and special services were created to maintain a

steady flow of consumer educational material to food editors of newspapers and magazines and to food commentators of radio stations. Illustrated literature of various types, primarily for the use of school teachers, was published as part of a long-run plan to educate children on the importance of the fishery and its place in Canadian affairs. Special efforts were made to emphasize the importance of conservation, particularly in those areas where damage to, or destruction of, valuable migrating or spawning salmon were creating problems.

Regular Departmental publications also issued during the year included the monthly journal, "Trade News," and "The Canadian Fish Culturist." In addition, some Departmental advertising was conducted.

Economic Studies

The Economics Service carried out a number of investigations into production and marketing problems. One of these, a study of the marketing of fish products in a test area (Peterborough, Ontario), was published in July, 1949, and provided valuable information which is applicable on a general basis.

Early in October "Canadian Fishery Markets, Review and Outlook, Bulletin No. 3," was published. This report, one of a series, included an analysis of the devaluation of the pound sterling and the Canadian dollar in respect to effects on marketing of Canadian fishery products. Tariff Bulletins No. 3 and 4 were also issued, the former giving a review of the negotiations at Annecy, France, which had a bearing on the exports of Canadian fish products, and the latter containing a preliminary note on the third round of tariff negotiations under the General Agreement on Tariff and Trade which was to take place in the ensuing year.

Another report, issued early in 1950, gave a preliminary survey of conditions of work in the fishing industry across Canada. Entitled "Employment in Canadian Fisheries," the report is the first of its kind ever issued by the Department and serves as a valuable reference work on the main characteristics of the industry according to geographical distribution, production, capital, equipment, employment and governmental action.

The studies carried out by the Economics Service were supplemented by special studies made by the Fisheries Prices Support Board.

The Department maintained liaison with the Food and Agriculture Organization of the United Nations and a member of the economics staff attended the Fifth Session of the FAO Conference held at Washington in November and December.

CONSERVING AND DEVELOPING THE RESOURCE

THE word "conservation" as far as the fisheries are concerned is generally interpreted as being control in such a manner as to allow maximum catches, yet still guarantee runs for perpetuity.

To enforce the various regulations which are designed to conserve the fisheries, the Department maintains fishery officers on land and on vessels at sea. This force in 1949–50 cost $2,802,930, more than one-third of the total $7,586,370 expenditure made by the Department. Although some of the field staff maintained under this vote were officers employed in inspection of fish products, the majority were engaged in conservation work and enforcement of the regulations pertaining to the protection of fish stocks.

In addition to conservation measures to allow sufficient natural seeding, the Department carries out an extensive programme to improve conditions for natural propagation and also applies artificial methods where needed.

The fiscal year 1949–50 saw a further expansion of fish culture in the broad sense. The expanded programme, begun in 1948–49, included stream improvement and management, fertilization of waters and predator control. Expenditures in connection with fish culture development, exclusive of oyster culture, totalled $548,751 in 1949–50.

Pacific Salmon

The value of the Pacific salmon fishery to Canada is increasing each year, but to properly understand its importance is not to assess it on the basis of its annual dollar value. Any proper assessment must be made on the basis of its recurring annual value. This fishery has been prosecuted on a large scale for some fifty years. Its yield is now close to $40 million a year. With wise management it can continue, and over the next fifty years it could yield in the neighbourhood of $2 billion. Since it is a natural heritage and since it requires little more for its self-perpetuation than reasonable management, it is deserving of the fullest possible conservation and development. Aside from the employment that it provides, it is an industry in which there is a significant investment in boats, plants, gear and equipment. As a food resource the salmon is of vital importance. It lends itself admirably to processing in several forms and in its canned form it is suitable for shipment to any part of the world. In these days of growing world food shortages and urgent needs for protein the responsibility for maintaining the salmon resource is of paramount concern.

Under the Fish Culture Development Branch of the Department an increased programme of stream improvement was initiated for Pacific salmon. An engineering-biological group was established for this purpose. The biologists' function is the interpretation of the reaction of fish while the engineers, with the knowledge of these habits, design ways and means to overcome difficulties in natural obstructions or those caused by industrial expansion. The engineering-biological group was charged with the task of undertaking improvements in the 1400-odd salmon streams. This work included designing fishways to ease passage of fish over major obstructions and working out methods of preventing or reducing adverse effects on the salmon of industrial development.

The work of the fishery officers in British Columbia is an important contribution to the conservation of salmon. Not only do they regularly examine and report on the spawning conditions in the salmon streams in their districts but they remove as many hazards to migration as possible. It was recognized, however, that other tasks made it impossible for fishery officers to give as much time as was desired to the problem. As a result the responsibility of co-ordination was given to the newly-formed engineering-biological group. However, the fishery officers themselves removed obstructions from approximately 143 streams. On several occasions they were able to salvage salmon fry on spawning grounds which, due to adverse natural conditions, might otherwise have been lost.

In some instances, problems involved in stream clearance are of such types as to require skilled workmen, such as rock drillers and woodsmen. A stream clearance crew under a trained foreman was organized and removed obstructions from six small tributaries of Babine Lake, including Grizzly, Six Mile, Four Mile, Pendleton, Sockeye and Tachek creeks. Later the crew cleared Sweltzer and other creeks on the lower mainland.

Certain major projects required completed surveys and thorough analyses of engineering and biological data to overcome the difficulties. These were made the responsibility of the engineering-biological group and included:

(a) A survey of the Nanika River, Morice Lake area and Skeena River, to provide data to assess the effect of proposed power development plans.

(b) A survey of Moricetown Falls, Bulkley River, Skeena River system, to design fishways to ease the passage of salmon which will be more difficult if power development reduces the discharge.

(c) Bridge River salvage programme to design sound methods of saving the run of spring salmon now blocked by a diversion dam for power purposes.

(d) Nimpkish River, Vancouver Island, survey and improvement to ease the passage of sockeye salmon over Karmutsen Falls.

(e) Sproat Falls, Vancouver Island, survey to devise remedial work to allow passage of salmon.

(f) Maggie River, Vancouver Island, survey to determine advisability of continuing repairs to the fishway and further transplantation of salmon.

(g) Coquahalla River, Fraser system, to consider remedial action on blockages caused by a slide.

(h) Birkenhead spawning grounds survey to outline measures for protection of spawning areas and property.

(i) Nanaimo River, pulpmill survey to determine the best means of supplying water to the mill yet protect the spawning grounds.

(j) Jones Creek, investigation to design methods of overcoming effects of a proposed power development.

(k) Fraser River, pumping station surveys and tests to design methods of eliminating loss of young fish in the pumps.

(l) Sauch-en-auch Creek, dam designed in Pender Harbour to ease passage and maintain water level in Sauch-en-auch Lake.

In the autumn of 1949, a large hydro power development was proposed for the Nechako-Nanika watershed in northern British Columbia. In October, the Department outlined its views at hearings held by the comptroller of Water Rights of British Columbia. The Department maintained that there is room for future expansion of both the power industry and the fishery, but that freedom to develop one has to be compatible with freedom to develop the other.

The hearing emphasized the necessity of closer liaison between the Federal Department of Fisheries and the Provincial authorities in analysing the effects on the fisheries of industrial development projects. Because of the rapid industrial expansion throughout British Columbia, and the increased demands for water, for power production and other uses, additional responsibility has been placed on the Federal Department. It was largely because of these that the engineering-biological group was formed and attached to the Chief Supervisor's office. It is this group's responsibility to gather information on the probable effects of such developments on the fishery, to suggest remedial measures and to advise on all matters relating to these now important questions.

Atlantic Salmon

On the Atlantic side of Canada, a single and much less industrially important species of salmon each year migrate to and spawn in freshwater streams. In varying numbers this fish is found in all of the Atlantic Coast provinces, although the largest runs are in New Brunswick and Newfoundland. The conservation of this species is of vital importance to many commercial fishermen who derive earnings from it, and to all of the provinces because of its great value as an attraction to sport fishermen from both Canada and the United States.

In April, 1949, the Department offered to co-operate with the Atlantic Coast provinces in a programme to rehabilitate the Atlantic salmon fishery. Representatives of Quebec, Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland met with Department officials in Ottawa to discuss the need for such a programme and the best means of carrying it out. As a result, the Co-ordinating Committee on Atlantic Salmon was created. An advisory committee in each of the five provinces, representing the commercial and sport angling interests was suggested to work with the federal authorities.

At a subsequent meeting of the Committee, four sub-committees were named to report on the problems of research, development, legislation and status of the salmon fishery in each province. The sub-committees also were asked to make suggestions for future improvement in the fishery. Before the close of the fiscal year, all sub-committees submitted reports indicating considerable progress.

The Department also concentrated in 1949–50 on stream improvement work and carried out a detailed investigation of those obstructions which have been hindering or preventing the movement of salmon to the spawning grounds.

Many obstructions were minor in nature and were cleared by the officers patrolling the areas. Twenty or more of these required special treatment. In addition, nine fishways were constructed or repaired to aid the passage of salmon up-stream, as follows:

(a) Grand Falls River, Richmond County, N.S.—Channel paralleling the falls was further excavated and 20 concrete baffles dowelled in the rocks to form resting pools. This work, with the fishway previously constructed, overcame the difficulty of ascent and salmon now find their way to the upper reaches.

(b) Great Salmon River, Pejepscot Dam, St. John County, N.B.—Wooden fishway renewed, giving a ladder 140 feet in length containing 20 compartments. There still remains a difficult problem of keeping the structure in place in the 29-foot tides which submerge the ladder to the 10th compartment and allow violent wave action from the Bay of Fundy, one-quarter of a mile distant.

(c) Salmon River, Victoria County, N.B.—Theriault dam fishway repaired.

(d) Tusket River, Yarmouth County, N.S.—New concrete "run-around" fishway completed at the generating station by the Nova Scotia Power Commission, from the survey and plans of the Department.

(e) Tusket River, Yarmouth County, N.S.—The 60-foot wooden ladder at the impounding dam at Reynardton renewed by the same company from Departmental plans.

(f) East River, Halifax County, N.S.—Concrete fishway constructed by the Nova Scotia Power Commission from Departmental plans.

(g) Osier River, Halifax County, N.S.—New fishway installed in Hubley's dam.

(h) Nictaux River, Annapolis County, N.S.—Wooden fishway at Nictaux replaced by the Nova Scotia Light Heat and Power Company.

(i) Vernon River, Queens County, P.E.I.—A small but new and effective fishway completed.

What has been done is only a beginning. Many more surveys for new works have been carried out. With the co-operation of the companies and small industries, which has been excellent thus far, it is not too much to hope that eventually most of the existing difficulties will be removed and free access to the spawning grounds will result.

General Fish Culture

During the summer an experienced biologist and four student assistants made general surveys to assess the trout-carrying capacities of selected bodies of waters and to carry out "pilot-plant" experiments to eliminate coarse fish populations which appeared detrimental to introduced hatchery stocks. Both these projects were designed to solve the very important problem of using hatchery products in the most efficient manner.

The choice of waters for investigation was made in co-operation with the Fisheries Research Board of Canada so that attention might be focussed on areas about which little is known. Much detailed data were recorded for 10 lakes in New Brunswick. These were Ritchie, Mud, Lower Loch Lomond, Middle

Loch Lomond, Upper Loch Lomond, Cassidy, Round, Nelson, Walton and West. Information is now available for a decision on the necessity of planting and the type and size of fish most suitable for that purpose.

Over recent years, the hatchery establishments confined to the Maritime provinces of New Brunswick, Nova Scotia and Prince Edward Island, had through force of circumstances been maintained with just sufficient repairs to give moderately efficient operation. Expansion in numbers of establishments was, therefore, not considered advisable until the existing ones were brought to peak operating efficiency and until it was decided that they were not then able to produce sufficient stocks to satisfy the demands. The first task was to bring them to this top efficiency and for that reason approximately $130,000 was requested over and above the operating grant of $360,000 in 1948. Major repair and construction projects included the completion of a new plant for salmon rearing at Haley Brook, Victoria County, N.B.; the completion of a permanent dam for salmon retention at River Philip; the construction of a sub-hatchery at Cobequid to replace a makeshift shed; construction and rebuilding of circular ponds at Florenceville, Cobequid, Grand Lake, Coldbrook, Kejimkujik and Lindloff hatcheries; laying new concrete floors at the Antigonish, Bedford and Charlo plants, and the building of a new garage and storage building at Saint John. Two new concrete long ponds were built at Cobequid, one section was renewed at Stevens pond near Middleton, and three long ponds were rebuilt at Margaree. New freezing units were installed at Coldbrook, Lindloff and Charlo. Electric power was extended to Lindloff and telephone connections provided to Kejimkujik, Lindloff and Cardigan. To these may be added painting of most establishments and repairs to many dwellings. There is no doubt that repairs will be needed constantly but the basic units are now moderately sound.

From the 13 main hatcheries, six rearing stations, six salmon retaining ponds and several egg collecting stations, there was a total stock output of 28,976,000, over 79 per cent of which was in fingerlings and older fish.

Collections of ova totalled 49,602,000. Hatchery brood stock produced 28,695,000 speckled trout eggs, 144,000 rainbow trout, 22,000 landlocked salmon and 89,000 Atlantic salmon. Ova from wild fish included 12,600 speckled trout, 196,000 landlocked salmon, 20,433,000 Atlantic salmon and 10,400 Walton Lake charr (*Salvelinus alpinus*), a new record for the region.

Of the 20,433,000 Atlantic salmon eggs, 2,580,000 were collected from the Restigouche River, through the courtesy of the Restigouche Riparian Association and laid down in Charlo hatchery. Domestic supplies, through exchange, were augmented by 300,000 brown trout eggs and 138,000 rainbow from the United States Fish and Wildlife Service, by 141,000 rainbow from the New York State Conservation Department and 150,000 brown trout from Ontario.

Approximately 2,250,000 landlocked smelt eggs were obtained from Lake Utopia and planted in approximately equal numbers in the affluents from Mill, Chamcook and Wheaton Lakes. Four adult smallmouth black bass were transferred from Lake Utopia to Clark's Lake, St. John County, N.B., to supplement the seven placed there in 1948. Fifteen speckled trout were taken from Antinori Lake to Charlo hatchery and 30 Walton Lake charr to Saint John hatchery for brood stock.

Experiments with different diets were continued. Selective breeding of fish which show high egg yield, rapid growth, early spawning habits, etc., seems to be giving profitable results. To check movements and survival of planted stock, over 46,000 young fish were marked by the removal of one or more fins and 900 were tagged. One hundred and fifty-two marked fish and several tags were recovered to add to the data on this subject.

The results being obtained from stocking of waters with indigenous fish are difficult to assess. The continued excellence in 1949 of the speckled trout fisheries in waters such as West Lake, Queens County, and Howe and Mayflower lakes, St. John County, N.B., must be associated with the success of the hatchery operations. Excellent fishing was reported from Lindloff Lake, Cape Breton, and in Black River, Blacketts, Catalone and Thompson lakes in the same general area. Mancini Pond in the Margaree district was barren before stocking and is now producing seven to nine-inch trout. Coggins, Tedford and Holmes lakes in Yarmouth County, and Knoxford, Moose and Davidson lakes in the Florenceville area, seem to be showing very definite results from restocking.

Where non-native species of fish are introduced, the results are more readily determined. Large numbers of rainbow trout are visible in such streams as Crooked Creek and Big Salmon River, N.B. and in Sunken and Rumsey lakes, N.S. In the latter, over 3,000 fish of an average weight in excess of one pound were taken through the late summer. Rainbow trout are being captured in the Cardigan River and adjacent streams on Prince Edward Island.

Excellent catches of brown trout were taken in Loch Lomond and Little River watersheds in New Brunswick and in the Cornwallis and Guysborough rivers, N.S. In the estuary of the Guysborough, sea-run browns from five and a half to eleven pounds are being taken in large numbers.

Atlantic salmon liberated as fingerlings in landlocked Clear Lake, Charlotte County, N.B., have produced individuals up to five and a half pounds of excellent table quality. Of 152 Sebago salmon taken for spawning purposes in the Chamcook lakes, Charlotte County, N.B., in the autumn, over 50 per cent were marked hatchery fish; of the 42 taken at Rawdon River and Waverly run, Grand Lake, N.S., 14 per cent were marked; and of the 172 impounded for egg collection, 14 per cent bore hatchery marks.

Provincial Co-operation on Conservation

During 1949 numerous conferences between representatives of the Dominion and Provincial Departments of government led to closer co-operation in matters relating to fish culture. A committee including officials of various branches of the New Brunswick government, the Fisheries Research Board of Canada and the Fish Culture Development Branch now meets regularly to discuss programmes in which all may co-operate. This led to the selection of flowage sites for development of trout fisheries by the Provincial Department, with assurance of fish stocks from the federal hatcheries. Complete agreement has been reached with the Department of Trade and Industry of Nova Scotia which carried on with their investigations while the Federal Department worked along other lines without duplication, each agency being fully informed of the efforts of the other.

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In co-operation with the United States Fish and Wildlife Service, sites were selected for experimental planting of Atlantic salmon fingerlings on the St. Croix River. The 100,000 fingerlings planted were supplied by the Saint John hatchery.

Co-operation with the Fisheries Research Board of Canada was continued and expanded in providing stocks for numerous experiments including those on the Charlotte County lakes, the Prince Edward Island experimental trout ponds and the Pollett River Atlantic salmon bird control test.

Displays of parent and brood stock were made at Moncton, N.B., at Lunenburg, N.S., at Glace Bay, N.S., at St. Stephens, N.B., and at Caribou, Maine.

The Canadian National Railways, the Canadian Pacific Railway and the Dominion Atlantic Railway Companies have continued to furnish free transportation for shipments of game fish and fish eggs, with their attendants.

Oyster and Clam Culture

The Department of Fisheries, in close co-operation with the Fisheries Research Board, carried out investigations to improve the oyster and clam industry in the Maritime Provinces. Field supervision for the programme is exercised from the Prince Edward Island Biological Station at Ellerslie, P.E.I., a sub-station of the Board's Biological Station at St. Andrews, N.B. Expenditures in the fiscal year under review totalled $56,657 for oyster and clam culture work.

Routine services maintained by the Department included the examination and survey of new oyster leaseholds, relocation surveys of established leaseholds, the provision of seed-stock in limited quantities and the prediction of spatfall. There was also considerable call for advice on methods of culture and for the acceptance and transmission of such revenues as lease rentals and monies from sale of spat and oysters. These revenues amounted to $5,132.62.

Close to 1,300 leases involving some 3,100 acres of actual and potential oyster bottom were in effect as of March 1, 1950. There were, in addition, some 300 active applications for leases in the three Maritime Provinces. With the possible exception of northern New Brunswick where a shortage of suitable leasing bottom exists, there is ground available throughout the Maritimes to support operations on a larger scale. The limiting factor in all areas is the shortage of seed-stock.

A survey of oyster resources in Kent County, N.B., was started to estimate the position of the oyster industry there. Kent County, presently under provincial leasing control, has shown some interest in the Federal programme. A survey was made of the size and extent of the public fishery there.

In the Maritimes a general increase in interest in oyster farming prevails, with the possible exception of the Bras d'Or Lakes area of Nova Scotia. In the field of commercial scale trials of oyster culture techniques, efforts of the Department and the Board are so closely integrated as to be not easily separable. Broadly speaking, the Board assumes the task of discovering new methods through research and the Department provides the facilities for large-scale trials.

Attempts at Ellerslie to devote whole beds in starfish-free waters to the rearing of small oysters from oyster spat failed because of the buoyancy of the spat at this early stage. The least wave action tended to roll the spat shoreward where it eventually piled in rows to smother and die. Tray rearing of one type or another

appears to be the only immediate solution to the problem. In this respect, trials at all four stations on a qualitative basis only for the Dutch type of rearing tray were initiated. Oysters are usually tray-reared one growing season, but normally growth is not sufficient to permit safe transplanting of this stock to maturing beds. The Department is now utilizing the upriver starfish-free beds, previously referred to, for rearing these small oysters an additional growing season.

At Malagash, arrangements were made to construct a new dyke in an adjacent silt-free area. The Department's object there is to demonstrate the practicability of utilizing tide flats for production of seed oysters as is presently done in many European countries and part of the United States. If successful, the method should prove to be by far the cheapest method of rearing small oysters. Silt deposits in the Department's former dyke made operations in this respect impractical.

Suspending the usual concrete coated egg crate fillers from pole fences erected in the spawning zones proved highly successful and cheaper than the floating suspension now used extensively in the Malpeque area. Wooden retainers used in place of wire netting for wrapping cement coated fillers also worked well in the protected waters around Ellerslie, but in contrast, they were found to be impractical at Shippigan where the retainers offered too much resistance to wind and wave action which consequently buffeted the fillers inside them until they disintegrated.

From trials conducted thus far in an effort to rear spat directly on the bottom in the intertidal shore areas, it is obvious that only the most carefully selected sites will prove successful. Problems the growers will meet in like circumstances will be smothering by silt and heavy growths of epithytic organisms, smothering by tidal algal growths such as sea-lettuce, uprooted by storms and cast shoreward, and the usual piling up of spat on the shore by wind and wave action. The method is not expensive, produces a poor to average growth depending on conditions, and is usually accompanied by mortalities of spat up to 50 per cent. Some good results have been reported by growers but only in isolated instances.

A light drag, designed to hold the bottom by resistance of water pressure against a specially installed inclined plane has been successfully used for dragging operations on small shallow water leases. Further tests are being conducted on deep water areas to ascertain its efficiency there. Growers in Prince Edward Island and Northern New Brunswick have expressed considerable interest in this gear. The drag is light enough that it does not harm the bottom being dragged, and it should do much to increase the efficiency of fishing operations, thereby decreasing the costs.

Exploratory Work

Another phase of the Department's activities in development of fishery resources was associated with the fishery for albacore tuna of the North Pacific. The policy of exploratory patrols, initiated by the Department in 1948, was continued in 1949 and the Department's vessels were of material assistance in locating schools of tuna, advising the fleet and exercising generally supervisory and protective work throughout the season. A senior fisheries officer conducted technical experiments in connection with various types of fishing gear. Biological researches begun in 1948 were continued by a scientist from the Fisheries Research Board's Nanaimo, B.C., Station, who was assigned to the expeditions.

A new commercial fishery began at Nueltin Lake, which straddles the border between Manitoba and Northwest Territories. Licences were issued to commercial fishermen to fish in that portion of the lake which lies in the Northwest Territories and a quota of 250,000 pounds, round weight, of whitefish and trout was allowed. On recommendations of the Research Board, the Department permitted the opening of the lake to commercial fishing after it had assurances that the Eskimo population residing in that area would be employed in the fishing effort.

Predator Control

Damage by hair seals to nets and fish caught in nets off the British Columbia coast continued to present a serious problem. The Department's policy of paying members of the public a bounty of $5 each on presentation of hair seal noses was continued in 1949.

A significant toll was taken of these predators by the Department's fishery officers. As the hair seal populations of the Skeena River estuary and other northern areas are particularly destructive, special measures were taken to reduce their numbers. In the summer of 1949 Departmental officers accounted for more than 600 hair seals and obtained valuable biological data.

The depredations to fisheries by sea lions along the British Columbia coast are such that a constant thinning out of these animals is necessary. The Department's officers carried out successful operations in 1949, killing 358 sea lions.

The Department brought into effect regulations specifically protecting the beluga whale from sportsmen in the areas of Hudson Bay, Hudson Strait, James Bay and Ungava Bay. The Regulations permit only those with licences granted by the Minister of Fisheries to fish or kill belugas, the blubber of which yields oil of a very good quality. Only full-blooded or half-blooded Indians and Eskimos or members of the Royal Canadian Mounted Police, are allowed to take belugas without a licence for their own domestic use and for the feeding of their dogs. The beluga is an important item in the economy of the Indians and Eskimos and the Department, pending further information on the populations and migratory habits of these sea mammals, permits only a small quota to be killed annually for industrial products.

Regulations for the commercial fishery at Great Slave Lake, Northwest Territories, were amended to permit a total catch limit of whitefish and trout of 9 million pounds for the 1949 season. This catch quota represents an increase over 1948 and was recommended by the Fisheries Research Board scientists.

The initial scientific survey of Great Slave Lake was made in 1944 by the Research Board. Commercial fishing was first allowed in 1945. The lake is now one of the greatest commercial sources of whitefish and lake trout in Canada. Because of complete federal jurisdiction in the Northwest Territories, it provided an outstanding opportunity for a programme of fishery management based on research and scientifically applied conservation measures. This is the first, if not the only, fishery which has been opened to commercial fishing after scientific investigations have been carried out. Development of the fishery has contributed greatly to the growth of the settlement on the shores of the lake and the native Indians have had the opportunity of participating in the fishing activity.

Protection Services

Figures given earlier in this report showed that approximately one-third of the expenditures by the Department went towards maintaining a field staff of fishery officers on land and on vessels at sea, engaged primarily in protection of the fishery resources.

During 1949-50 the total field staff of the Department numbered 1,500. This represented an increase over 1948–49, mainly as a result of the additional fishery officers, guardians and patrol vessel crews taken on for the new province of Newfoundland. The Department operated a fleet of 61 protection and patrol vessels, eight of which were purchased during the year. The Department also chartered about 100 vessels for similar work.

Departmental Vessels, 1949-50

Name	Tonnage	Length	Crew	District
Maritimes Area—				
A. Halkett	30	56′4″	4	Cape Breton Island
Alosa (formerly Fundy Rover)	52	62′5″	4	South Coast, N.B.
Annette Allard	18	48′0″	3	Bay of Chaleur
Capelin	37	56′3″	4	Bay of Fundy
Crago	13	34′0″	2	Miramichi Bay
Cygnus	581	155′4″	32	Maritimes generally
Capital II	16	42′0″	3	West Prince County
Gilbert	17	50′0″	3	South West Coast, N.S.
Gannet Rock II	15	45′8″	2	Grand Manan, N.B.
Lacuna	61	64′5″	5	South East Coast, N.S.
Limanda	61	64′5″	5	Bay of Fundy
M. 201	16	38′0″	2	Northumberland Strait Area
Macoma	13	34′0″	2	South Coast, P.E.I.
Menidia (formerly Hazel M.)	launch	24′0″	1	Charlottetown Area
Modiolus	13	34′0″	2	Yarmouth Area, N.S.
Mya	13	34′0″	2	Northumberland Strait Area of N.B.
Osmerus (formerly Straits Rover)	25	40′0″	3	Newcastle Area, N.B.
Pecten	13	34′0″	2	Kent County Coast, N.B.
Venning	16	49′5″	3	Northumberland Strait Area, N.B.
Newfoundland—				
Malakoff	313	135′6″	15	St. John's (Bait Service)
Cinderella	28	56′5″	3	St. John's
Eastern Explorer	52	73′5″	8	St. John's (Bait Service)
Fishboard	13	37′3″	2	Little Bay Islands
Louise Ruth	20	41′8″	2	Bay of Islands
Paragon*	–	34′		Port aux Basques
Point May	31	53′0″	3	Fortune Bay
Sabinia*		40′		Fortune Bay
Northwest Territories—				
Daphnia	13	34′		Great Slave Lake

*Taken over from the Newfoundland Natural Resources Department.

Name	Tonnage	Length	Crew	District
British Columbia—				
Agonus (formerly Beverly Joan)	19	37′	2	Vancouver
Arrow Post	44	54′6″	4	Bella Bella
Gray Goose	16	37′3″	1	Tofino
Atlin Post	45	61′5″	5	Nanaimo
Babine 1	launch	20′	1	Babine Lake
Babine 2	launch	20′	1	Babine Lake
Babine Post	52	55′7″	4	Butedale
Beldis	21	47′	3	Rivers Inlet
Black Raven II	25	46′5″	3	Kuathiaski Cove
Bonila Rock II	23	47′	3	Bella Coola
Chilco Post	48	63′	5	New Westminster
Ciona (formerly Snipe)	14	34′5″	2	New Westminster
Barmar	38	52′	4	Vancouver
Comox Post	45	54′2″	4	Port Alberni
Clupea	25	36′2″	3	Prince Rupert
Diaphus (formerly Nasparte)	16	39′6″	1	Nootka Sub-Dist.
Egret Plume II	25	46′5″	3	Nanaimo
F. D. 101	8	33′	2	New Westminster
F. D. 102	11	34′1″	2	New Westminster
F. D. 201	10	33′3″	2	Arrandale
F. D. 202	18	38′2″	2	Bella Bella
Howay	198	115′7″	15	Victoria
Kitimat	79	79′7″	10	Victoria
Laurier	201	113′	15	Victoria
Nicola Post	48	63′	5	Prince Rupert
Onerka II	25	46′5″	3	Arrandale
Pholis (formerly Nahmint Post)	16	37′3″	1	Quatsino
Pursepa	21	47′	3	Pender Harbour
Arleigh	8	31′9″	1	Victoria
Sooke Post	52	55′7″	4	Queen Charlotte City
Stuart Post	44	54′6″	4	Alert Bay
Swantail II	19	40′3″	3	New Westminster
Vedder River	14	39′6″	3	New Westminster

Thus the cost to the Canadian taxpayer for the protection of this important food resource is considerable. The lobster fishery in the Maritime provinces and the salmon fishery in British Columbia, both of which are intensely prosecuted because of high market returns, present the greatest problems in protection and the majority of offences are violations of the fishing regulations for these two species. In 1949–50, in the fishing areas administered by the Department, there were 694 prosecutions, 385 of which were in the Maritimes, 301 in British Columbia and the remainder in the Yukon and Northwest Territories. At the same time there were 1,073 confiscations of fishing equipment for illegal fishing. Many of these confiscations were not accompanied by court prosecutions since the owners were not identified.

The maintenance of a fishery resource provides the means of livelihood for fishermen, processors and shore plant workers. The industry, both fishermen

and processors, can and should help in seeing that regulations are enforced. Protection work is not a matter of Government against Industry but rather a matter of Government and Industry rooting out the few offenders who are ready to steal the livelihood of the others and ready to deplete the resource for all time. Industry itself is as vitally concerned as the Department in maintaining a good fishing industry for to-day and tomorrow and next year, and for years to come.

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INTERNATIONAL FISHERIES CONSERVATION

THE world's greatest known fishery resources are concentrated for the most part in specific areas in the Northern Hemisphere, many of these resources being adjacent to Canadian shores. For example, the Pacific salmons are found in prodigious quantities along the entire coastline of North America from the state of Washington through to Alaska and the Bering Sea. The Columbia River in the United States, and the Fraser and Skeena rivers in Canada are among the world's greatest producers of salmon, the Fraser being by far the most important of all sockeye rivers. Pacific halibut and herring are also found in great numbers off the coast of British Columbia. In addition tuna, cod, grayfish and anchovies are caught. Inland waters such as the Great Lakes and Great Slave Lake add to Canada's great freshwater fishery. On the Atlantic coast, the inshore and offshore fishery of Quebec, the Maritimes and Newfoundland provide tremendous quantities of a wide variety of fish, the most valuable being lobsters, the ground fishes (cod, haddock, hake, cusk), halibut, herring, rosefish, swordfish, tuna, etc. Oysters, scallops and clams are also important.

The fisheries beyond established territorial limits, however, are an international resource and are there for the taking by fishermen of all countries. The banks off the Atlantic coast, for example, have been harvested for generations by men and ships from Canada and the United States, and from a number of European countries such as France, Spain and Portugal. The Great Lakes fishery is shared by Canada and the United States. The Pacific Coast fishery is also shared by Canada and the United States.

Although most fish are prolific and replenish their numbers with relative ease, they do not constitute an inexhaustible resource. The greatest danger to stocks, therefore, is not biological, but economic depletion. In other words, without proper control it is possible to reduce supplies to such an extent that it becomes unprofitable to fish for them. Since the fishery, then, is to a large extent an international pursuit, and since it plays such a significant role in domestic and world feeding—a role that may become more vital in the years ahead—international agreements on conservation measures for certain divisions of it are essential. Canada and the United States for years have led the world in joint fisheries conservation development and have, indeed, shown how bordering nations can work peacefully together in a common enterprise.

The major examples of joint conservation effort are the International Fisheries Commission (concerned with the preservation of the halibut stocks of the North Pacific and the Bering Sea) and the International Pacific Salmon Fisheries Commission (concerned with the conservation and development of the sockeye salmon of the Fraser River). Canada also co-operates with the United States in the preservation of the fur seals of the Pribilofs (through the Provisional Fur Seal Agreement of 1942),

while another agreement for the conservation and development of the Great Lakes fishery is pending. Other treaties to which Canada has subscribed are the International Northwest Atlantic Fisheries Treaty and the International Whaling Treaty. There are, furthermore, between Canada and the United States certain reciprocal port privileges which help the fishermen of the two countries.

International Fisheries Commission

Since the establishment of the International Fisheries Commission, stocks of halibut on the Pacific fishing grounds have more than doubled and a continuing yield for the industry has been maintained. The Department is represented on the Commission by Mr. George R. Clark, Assistant Deputy Minister, who was named a Commissioner in September, 1949, replacing the Deputy Minister, Mr. Stewart Bates. Mr. Clark was later named Secretary of the Commission for the 1950–52 period. Expenditures by the Department to support the work of the Commission during the fiscal year amounted to $34,745.

In 1949–50 meetings of the Commission were held to review current results of regulations and investigations. Regulatory changes were adopted and the investigational programme for the ensuing season was considered. The Commission also held public hearings at ports along the Pacific Coast in connection with the proposal that the fishing season in each area be split into a number of successive open and closed periods, as a means of extending the fishing season.

The regulations for the halibut fishery in 1949 were essentially the same as those of 1948. The section pertaining to use of bait nets by vessels with halibut fishing licences was revised to assure that the character and use of bait nets conformed to the laws of the country where the nets were used. Details of the Commission's work may be found in its Annual Report for 1949.

In addition to Mr. Clark, members of the Commission were Mr. George W. Nickerson, Prince Rupert, B.C., representing Canada; and Mr. Edward W. Allen and Mr. Milton C. James, representing the United States. Mr. Nickerson was Chairman and Mr. James, Secretary.

Additional international action in connection with the Pacific Halibut Fishery was taken toward the close of the fiscal year when a convention allowing reciprocal port privileges for halibut fishing vessels on the Pacific Coast was signed by the late Hon. Lawrence A. Steinhardt, then United States Ambassador to Canada, and the Hon. R. W. Mayhew, Minister of Fisheries, on behalf of their respective Governments. The convention assured Canadian and United States halibut fishermen of reciprocal port privileges in landing of catches for trans-shipment, and obtaining supplies, repairs and equipment. Formerly the arrangement had to be renewed each year.

International Pacific Salmon Fisheries Commission

The International Pacific Salmon Fisheries Commission during 1949 continued its work of restoration and management of the sockeye salmon of the Fraser River system as required by the Treaty between Canada and the United States. The Treaty has been in effect since ratifications were exchanged on July 28, 1937. In support of the work of this Commission, the Department contributed $124,934

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for the regulation of the fishery and $57,874 as its share for fishway repairs or construction. Mr. A. J. Whitmore, the Department's Chief Supervisor of Fisheries for the Pacific Area continued as a Canadian member along with Mr. Olof Hanson and Senator Thomas Reid. United States members were Mr. Edward W. Allen, Mr. Albert M. Day, Mr. Alvin Anderson (July to December) and Mr. Milo Moore (January to July).

The catch regulations for 1949 were designed to allow larger proportional escapements of the most depleted sockeye races within the Fraser watershed, to allow adequate escapements from those races whose numbers are approximately normal and to divide the catch as equally as possible between Canadian and American fishermen. The engineering division of the Commission made repairs necessitated by the severe flood of 1948 and completed construction of the last of five fishways at Farwell Canyon on the Chilcotin River. Construction of the Quesnel Field Station was practically completed. Co-operative surveys and engineering studies were made with the biological division and existing fish protective devices were operated and maintained. Details of the Commission's work may be found in the Annual Report of the Commission for 1949.

International Northwest Atlantic Fisheries Commission

A step toward the conservation of the fisheries of the Northwest Atlantic was made when the International Northwest Atlantic Fisheries Treaty was signed on February 8, 1949, at Washington, D.C., by representatives of 11 countries: Canada, United States, Newfoundland, United Kingdom, Norway, Denmark, Iceland, Portugal, Spain, France and Italy. At that time Newfoundland had not entered Confederation. To be brought into force, the Treaty had to be ratified by any four signatory governments. Such action has been taken by Great Britain, Iceland and the United States. Since Canada is closest to the prolific fishing grounds of the Northwest Atlantic, the Treaty is of vital interest to this country and steps were taken to see that it was placed before Parliament for early consideration. When the Treaty is brought into force, a commission will be established on which the contracting governments will be represented. This commission will have jurisdiction over defined sub-areas of the Northwest Atlantic in which governments with particular fishing interests will have representation.

International Whaling Commission

Although Canada does not presently participate in the Antarctic whaling fishery, it has some whaling operations both off Newfoundland and off the British Columbia coast. It, therefore, is a member of the International Whaling Commission. In 1949, Deputy Minister Stewart Bates was named the Canadian Commissioner and attended the first meeting of that body in London, England, accompanied by Dr. W. Templeman of St. John's Biological Station, Newfoundland, as scientific adviser. The main duty of the Commission, which was established under the International Convention for the Regulation of Whaling, is to adopt from time to time regulations governing the conduct of whaling by the 15 contracting countries.

Provisional Fur Seal Agreement

The terms of the Provisional Fur Seal Agreement of 1942 between Canada and the United States provide that Canada shall receive 20 per cent of the fur seal skins taken annually by the United States Government in the waters of the Bering Sea and the Pacific Ocean north of the 30th parallel of north latitude and east of the 180th meridian. Legislation was enacted in 1947 to continue this agreement.

The seals live entirely in the water during the fall and winter months. Each spring large numbers of animals make their way northward to the Bering Sea and thus pass along the shores of British Columbia. They land and breed only on two small islands named St. George and St. Paul of the Pribilof Islands in the Bering Sea. While in Canadian waters the Department's patrol vessels give them full protection and ensure that the terms of the Agreement, in this regard, are carried out.

The Alaska fur seal has been protected since 1911 when the Pelagic Sealing Treaty was signed. At that time it was estimated that the number of seals on the Islands was only 123,000. Uncontrolled slaughter had reduced the herd, which 40 years previously had been estimated at between three and four millions, almost to extinction. To-day the herd is again believed to consist of more than three million seals, and during the interval, surplus animals have been killed and their skins marketed.

In 1949 Canada received 14,178 skins out of a total catch of 70,891. Sixty-five per cent was sent to St. Louis, Mo., for dressing, and 25 per cent to London. Ten per cent was sent to Toronto for the start of a new Canadian industry in the dressing and dyeing of Alaska fur seal skins.

Four auction sales were held in Montreal, June 14, October 27, December 1 and March 14, at which 11,543 skins were sold. Some 3,250 skins were sold in the United States to obtain United States funds to meet processing charges. The Montreal average prices were for St. Louis dye, $51.07 to $71.68 and for London dye, $41.54 to $45.37.

Total receipts from all sales were $835,916. Deducting processing, transportation and selling expenses leaves a net return to Canada of $549,069.

At the end of the year 15,432 skins were on hand in various stages of processing. Next year it is expected that sealskins dressed and dyed in Canada will be offered for sale for the first time.

United Nations Conference

A Scientific Conference on the Conservation and Utilization of Resources, sponsored by the United Nations, was held in New York in August. Both the Department and the Fisheries Research Board of Canada were represented on the nine-man Canadian delegation attending the conference. The discussions resulted in a much sounder understanding of commercial fisheries problems in other countries. Papers presented contributed to information being gathered by the conference on the world's resources and potential food production.

INSPECTION OF FISH PRODUCTS

THE Department continued its programme of extending its service to bring about higher quality fishery products. Regulations under the Fish Inspection Act and under the fishery sections of the Meat and Canned Foods Act provide for the inspection of canned fish, salted and pickled fish, oysters, smelts, and other species.

The Fish Inspection Act, which pertains to products other than canned, was revised and given approval by Parliament. The new Act, which was not proclaimed pending legislative action by provincial governments would give the Federal Government the power if necessary to meet the quality control needs of the industry and the authority to institute any inspection procedure in respect of fish moving in export and interprovincial trade. Revision of the Act will help further the progress of the fishing industry itself. Within the industry there have been continuous discussions on the problems of the quality of product as it reached the consumer. At a national meeting in Ottawa in September, 1949, the industry recommended, among other things, that the Government take certain steps to insure proper handling of fish products.

The new Act is one instrument for aiding the development of good quality products. Other complementary steps are equally necessary. There is much educational and demonstration work necessary among fishermen and processors and handlers of fish in certain regions. Such work always has to precede the institution of inspection.

In revising the legislation, the Department held several conferences with provincial authorities. Before the revision was finally drawn up, the Department had a conference with all the provinces. The officials of the fisheries divisions of the provincial governments agreed to co-operate and to recommend necessary provincial legislation to cover any deficiency in respect of inspection, particularly at the wholesale and retail level, which is within provincial jurisdiction. Discussions with the provinces are to follow with the view to providing for quality improvement of fish products, not only in export and interprovincial trade but also those produced for consumption within the province.

Another important development in the inspection service was the realization of the Department's plans, begun in 1948, for a new system of inspection of whitefish products offered for export from inland provinces. This extension of services was a significant contribution to Canada's inland fishery which represents a total annual marketed value of about $16 million.

The whitefish inspection regulations which were drawn up by the Department following discussions with the provincial authorities in 1948, were submitted to the trade for comment before going into effect on November 1, 1949, on a trial basis. The test basis was to continue until March 1 when the regulations would become compulsory. Subsequently, the trial period was extended to give the industry additional time to work out certain adjustments to product inspection.

The trial period was designed to permit the industry to adjust itself to the new procedures and techniques and allow a training period in the practical application of the scheme for the Department's inspection personnel. These objectives were attained in a large measure and it was shown that the system was workable and practical. The trial period also showed that the plan of product inspection was acceptable to the buyers of Canadian whitefish in the United States market and that those shippers taking advantage of the Department's service have had their shipments facilitated through United States border points.

The new inspection system supplemented in the Prairie Provinces the original inspection on the basis of lake surveys which began in 1944 under Dominion-Provincial agreement. Little new work in lake surveys was conducted during 1949–50 although 17 of the larger commercial lakes were resurveyed to further assess the quality of whitefish production. A preliminary lake survey programme was started by the Ontario Department of Lands and Forests for which the Department provides assistance in the form of experienced personnel plus the lake survey analysis service maintained in Winnipeg. A total of 21 lakes in Ontario were surveyed and assessed.

The bulk of the whitefish inspection work was done in the three Prairie Provinces and the Northwest Territories. Very little winter commercial fishing is done in Ontario so that the full import of the new inspection programme in that province could not be assessed in this review. The Inland Area fishery staff, which was increased last year, was further augmented in September when 22 new inspectors were appointed and given a three-week course of instruction at Winnipeg. Permanent inspection offices were opened in October at Edmonton, Big River, Prince Albert, Flin Flon, Winnipeg, Fort Frances, Sault Ste. Marie, Windsor, Fort Erie, Toronto and Montreal while temporary seasonal establishments were maintained at The Pas, Sherridon, Ilford, Port Arthur, Wheatley, and Niagara Falls. A resident senior inspector was appointed at Great Slave Lake and a 36-foot wooden vessel, the *Daphnia*, was shipped to the lake to assist in the patrol programme.

Fish Inspection Laboratories

Departmental inspection of canned fish products is carried out by fish inspection laboratories on both coasts. The Canned Fish Inspection Laboratory in Vancouver handled a greatly increased number of canned salmon inspections while canned herring inspections were sharply reduced.

Pacific Products Inspected:

Canned salmon inspections totalled 2,500, compared to 2,000 during the 1948–49 season. On the whole, as regards freshness the quality of the 1949 pack was somewhat over the 1948 pack. However, there was more trouble than usual with the "minced" salmon and the "tips and tails" salmon pack. This entailed an amount of work greatly out of proportion to the number of cases involved, because, since most codes of "tips and tails" and "minced" salmon consist of only a few cases, it is often the custom for the packers to include a great many codes in one parcel. Consequently, when a parcel is of questionable freshness, there is a great deal of analytical work to be performed before all the individual codes are properly graded.

In August the Salmon Canners' Operating Committee in Vancouver asked that grade softness limits for pink salmon be relaxed to the same values as those used for spring salmon, namely, 14 for tall cans and 14.5 for half-flat cans. Although it was thought that such limits would be too lenient for pink salmon, there appeared to be some justification for relaxing them somewhat, especially in view of the high cost of double-capping. Subsequently, the grade B softness limits for pink salmon were set at 12 for talls, and 13 for half-flats. This change will slightly decrease the quantity of pink salmon grade B, but will not seriously affect the general quality of the pink salmon pack.

In April inquiries were made of the laboratory regarding the use of ammoniacal nitrogen determinations to detect post-mortem spoilage in canned fish. This method is used by certain countries in the inspection of imported canned salmon. References were cited which showed definitely that unless a great many precautions are taken, these analyses would be meaningless, since ammonia is readily split off the protein present, by the alkaline reagent used in the determination. Moreover, the laboratory had not found the volatile bases, including ammonia, to be a good index of post mortem spoilage.

After September 15 the Canned Fish Inspection Laboratory became responsible for the inspection of canned fish imported into Canada through ports of entry west of the Great Lakes. This inspection is compulsory for all the following imported canned products: shrimps, crab meat, all fish in tomato sauce, fish pastes, herring and Peruvian tuna. All other imported canned fish products are subject to occasional examinations. Inspectors of the Food and Drugs Divisions of the Department of National Health and Welfare are responsible for the detection and sampling of these parcels.

The laboratory completed the analysis of the samples of fish canned for the Fraser River sockeye investigations. Work was begun on the analyses of samples collected for the Fraser River pink salmon investigation. However, the routine examinations of the 1949 salmon pack soon interfered and these analyses were interrupted. Progress with these remaining samples will be a little slower because of the necessity of determining, in addition to other analyses, both the Kjeldahl nitrogen and vitamin A content of the oil. It is expected that this work will be completed by the middle of 1950.

As in previous years, semi-routine incubation tests were carried out by the laboratory. More than 600 samples of canned herring and canned salmon were incubated for one month.

The laboratory again carried out a considerable number of private examinations. In addition to examinations made for packers of canned salmon and canned herring, several examinations were made for brokers who took precautions to have samples examined before importing canned fish into Canada.

Atlantic Products Inspected:

In the Department's Canned Fish Inspection Laboratory at Halifax, N.S., activities included the grading and inspection of canned fish produced in the area, the inspection of imported canned fish, the bacteriological examination of water supplies of plants, and the chemical analysis of various products.

Fifty-five lots were graded, composed of 22,500 cases, and grading certificates issued. In addition 148 lots were inspected and certificates issued for 22,400 cases, making a total of 47,900 cases of domestic canned fish under this phase of the work. The quantity of imported fish examined was 111,000 cases or cartons.

The three mobile laboratories which are used to examine water supplies made 133 visits to plants preparing shellfish meats, fresh lobster meat and canneries. Besides testing the water, the plants were inspected for sanitation, operating methods, and equipment. With this service available a gradual improvement is being effected.

Also on the Atlantic Coast, a total of 63·1 million pounds of products cured by salting were inspected. Salted dried fish was the main item, amounting to 31·3 million pounds. In 1948 the total quantity was 57·6 million pounds, groundfish comprising 30·1 million pounds. These inspections covered a wide variety of products, including salt dried, pickled, boneless, green-salted and hard cured smoked herring. In addition to the amounts mentioned, 333,600 boxes of smelts and 37,300 barrels of oysters were inspected, compared to 616,600 boxes of smelts and 38,500 barrels of oysters in 1948.

Newfoundland Products Inspected:

In Newfoundland exports of salt codfish were inspected in accordance with export specifications for the various grades and inspection was also made of all types of pickled fish, refined cod liver oil and other fishery products. All premises used in the handling of fish and fishery products were inspected as were also export packages for salted codfish and pickled fish. Every effort was made to improve quality and steps have been taken to establish a fish inspection laboratory at St. John's.

SPECIAL AIDS TO INDUSTRY

SEVERAL special expenditures were made by the Department during 1949–50 to assist the commercial fisheries in marketing its products, providing subsidies for the construction of draggers and for bait freezing and storage facilities.

The Fisheries Prices Support Board, which has the responsibility of recommending to the Government price support measures when severe price declines occur, supported the prices of frozen fish from Manitoba lakes. Relieving a difficult marketing problem the Board purchased 3,376,802 pounds of frozen whitefish, sauger, pike, pickerel, trout and tullibee valued at $281,740.43 This support programme was extended to 198 fishermen and 53 traders on the lakes. The Board made no purchases from wholesalers or exporters. The fishermen received $136,018.78 and the traders $145,721.65 directly from the Board. The fish acquired was disposed of mainly as feed to fur farmers and through reduction into fishmeal. The net cost to the Government was $264,807.89. The Board also incurred a loss during 1949–50 of $604,985.56 in disposing of the balance of the canned cod, herring and mackerel which it purchased in the previous fiscal year to support Atlantic Coast fish prices. Administration expenses for the operation of the Board for the year 1949–50 totalled $104,030.

Officers and members of the Board are: Acting Chairman, Mr. I. S. McArthur, Director of Economics, Department of Fisheries of Canada; Vice-Chairman, Mr. W. S. Lee, Halifax, N.S.; Members, Mr. L. Berube, Ste. Anne de la Pocatiere, Que.; Mr. H. I. Mifflin, Catalina, Nfld.; Mr. K. F. Harding, Prince Rupert, B.C.; Col. J. W. Nicholls, Vancouver, B.C.; Executive Director, Mr. H. C. L. Ransom, Ottawa.

Since general economic conditions during the 1949–50 period were such that the industry did not suffer any widespread loss of revenue, particularly in North American markets, there was no general demand for action by the Board. Nevertheless, the commodity and regional picture was spotty and required constant review. The depressed condition of the oil market, both for marine oils and vitamin oils called for much discussion and some indirect assistance from the Government in aiding the industry to market these products. The sealing industry of the Atlantic Coast region experienced a particularly difficult time with much lower prices prevailing for both oil and skins. At the close of the marketing year the problem of finding a satisfactory outlet for the 1949 salted cod production of Newfoundland was given detailed attention by the Board and the Government.

Economic Research

In the field, four research economists of the Board carried out on-the-spot surveys of conditions in many fishing communities and fisheries in response to instructions by the Board arising out of requests for support. In the Maritime provinces and Quebec, some 50 fishermen were induced to keep regular daily accounts of their fishing activities to provide data on costs and relative efficiency under varying conditions.

At Ottawa, the research activities of the Board's staff were divided into production and marketing economics, with greater emphasis being placed on the marketing side. Three economists were engaged in a continuous study of factors affecting the demand for fishery products in all markets, both domestic and foreign and in following the production pattern in major competing countries. The results of these studies were made available to the industry.

A second type of market research, that of studies of particular markets, was carried out by another group. This work was concentrated on the Toronto market in 1949. The study included the collection of data on the total flow of all types of fish (other than canned) into the Toronto market and its distribution through various outlets such as chain stores and other retail shops, restaurants and hotels, fish and chip shops, institutions and so forth. A preliminary study of the transportation problems of fish distribution was undertaken during the summer of 1949.

On the side of production research, the work at headquarters was confined to a study of the efficiency of different types of fishing craft operating in the offshore fisheries of the Atlantic Coast region. The study involved the analysis of historical records of a large number of craft operating over a period of years. A preliminary report has been distributed to the vessel owners for consideration and the work is being carried forward in 1950. The research staff also undertook many special investigations of economic problems referred to it by the Board or the Department. The work of the Board's staff and that of the economics staff of the Department in this field has been closely integrated under one head. Further details of the Board's work may be found in its Annual Report.

Capital Investment Aids

The regulations adopted by the Department to encourage the provision of facilities for freezing and storing bait where these were lacking or inadequate, resulted in the sum of $35,106 being spent in subsidies. This included $29,106 for two buildings in Prince Edward Island and $6,000 for one in Nova Scotia. The regulations provide that the Minister of Fisheries may grant assistance amounting to a maximum of 75 per cent of the cost but not exceeding $10,000 to any one applicant for the provision, maintenance and operation of bait freezing and storage facilities for fishermen. Applicants must enter into a 10-year agreement under bond to meet fishermen's requirements in their area at proper prices and to submit to inspection.

To assist the Atlantic Coast fisheries to improve their productive capacity, the Government may pay to Fishermen's Loan Boards in the Atlantic Coast provinces up to $165 per gross ton towards the construction of fishing vessels of approved design coming within the dragger or long-liner class and certified by the Board of Steamship Inspection. The subsidy is available for vessels of between 55 to 60 feet overall length generally and for longer vessels owned by groups of at least four fishermen. By agreement with the Loan Boards, the subsidized vessels are normally to be employed exclusively on fishing operations using trawls or power gurdies for five years. In 1949-50, the Department paid out $44,175 in subsidies, the entire sum being paid to fishermen in New Brunswick where seven draggers were built.

In connection with its efforts to improve productive capacity of the industry, the Department announced a change in its trawler policy on Atlantic Coast trawlers. Previously, licences for trawlers were issued only to Canadian-built ships. Under the new policy, licences will be granted to new trawlers built in the United Kingdom as well as in Canadian yards. Licences will be issued also to the better types of second-hand trawlers bought either in the United Kingdom or in the United States and registered in Canada after payment of duty. Licences to second-hand trawlers will be granted, however, only when the company has laid down a new keel in Canada.

Educational Extension Grants

The Department provides assistance in the education of fishermen by making payments to educational institutions which have agreed to carry out adult educational work among fishermen. Cost of these services totalled $75,173.22 of which $44,704.78 went to St. Francis Xavier University, N.S., $24,000 to the Social Economic Service of Ste. Anne-de-la-Pocatiere, Que., and $6,468.44 to the University of British Columbia. Another grant of $3,000 was made to the Nova Scotia Fishermen's Exhibition at Lunenburg, N.S.

Fishing Bounty

An annual fishing bounty of $160,000, to aid in the development of the sea fisheries of Canada and to encourage the building and fitting out of improved fishing vessels, is distributed by the Government to boat and vessel fishermen engaged in deep-sea fishing for at least three months a year, who have caught not less than 2,500 lbs. of sea fish, and to owners of boats (of not less than 12 feet in keel) and vessels (of not less than 10 tons). In 1949–50 16,463 eligible fishermen and the owners of 7,630 boats and 983 vessels received a total of $159,215.85.

FISHERIES RESEARCH

EVERY aspect of the work of the Department of Fisheries and of Canada's fishing industry is based upon research. The whole apparatus of promulgation and enforcement of fishing regulations is used for only one purpose, to increase the catch of the fish concerned. What regulations to enforce, and how each affects the stocks of the fish, can be determined only by continuous biological observation and experiment. Progress in fish culture depends upon knowledge of the survival of young fish planted in various types of waters, and their total contributions to the fishery of the area. Improvements to be made in conditions of life for fishes by means of predator control, new fishways and so on, must be measured against their observed performance in experimental trials.

On the technical side, the continuous improvement of the quality of fishery products involves unceasing experimentation. Better methods of filleting, refrigeration, curing and canning various types of products are desired in order to improve the quality of fish to the consumer and to facilitate marketing. Successful efforts along these lines lighten the burden borne by other Departmental services. It is not too much to anticipate that all Canadian fishery products can be made so attractive and saleable that support to prices will not be necessary, and inspection services can be kept at a minimum.

The body entrusted with investigations concerning various aspects of the Department's work is the Fisheries Research Board of Canada. Its membership includes in addition to representatives of the Department, senior scientists from several Canadian universities, and men prominent in the fishing industry. Members of the Board are, Chairman, Dr. G. B. Reed, O.B.E., Professor of Bacteriology, Queen's University, Kingston, Ont.; Vice-Chairman, Professor J. R. Dymond, O.B.E., Head of the Department of Zoology, University of Toronto; Dr. C. W. Argue, University of New Brunswick; Dr. A. W. Clemens, University of British Columbia; Mr. I. M. Fraser, University of Saskatchewan; Dr. J. H. L. Johnstone, Dalhousie University, Nova Scotia; Dr. Jean-Louis Tremblay, Laval University, Quebec; Dr. D. L. Thomson, McGill University, Montreal; Dr. Georges Prefontaine, University of Montreal, Quebec; Mr. K. F. Harding, Prince Rupert, B.C.; Mr. J. H. MacKichan, Halifax, N.S.; Mr. O. F. McKenzie, Halifax, N.S.; Mr. R. W. Walker, Vancouver, B.C.; Dr. A. L. Pritchard, Department of Fisheries; Executive Director, Mr. D. H. Sutherland, Ottawa. Further details of the Board's work may be found in the Board's Annual Report.

Close co-operation is maintained between the Board and the other divisions of the Department of Fisheries so that, for example, some investigations are conducted jointly with the Conservation and Development Service, particularly when they emerge from the strictly experimental to the "pilot plant" stage. Similarly, promising new technological developments are usually given their first large-scale trial in co-operation with some interested member of the fishing industry. Co-operation

with other private or governmental agencies is also maintained, notably with the National Research Council and the Royal Canadian Navy in respect to oceanographic investigations.

The work of the Fisheries Research Board is centered around seven permanent stations. Four of these are biological stations, devoted to the study of the living fish up to the time it is taken by the fisherman. They are situated as follows:

Atlantic Biological Station, St. Andrews, N.B.
Central Fisheries Research Station, Winnipeg, Man.,
Newfoundland Biological Station, St. John's, Nfld.,
Pacific Biological Station, Nanaimo, B.C.

In addition, temporary field stations are occupied as the needs of the investigations dictate. The Board's technological stations study the fish after they have been caught, while on their way to the consumer. There are three of them:

Atlantic Fisheries Experimental Station, Halifax, N.S.
Gaspe Fisheries Experimental Station, Grand River, P.Q.,
Pacific Fisheries Experimental Station, Vancouver, B.C.

Biological Investigations

Of the Fisheries Research Board's total expenditure of $1,278,383 during the fiscal year 1949–50, 65 per cent was allocated to biological and oceanographical investigations.

Exploratory Fishing:

The first need in biological work is to know what kinds of fish and other aquatic animals occur in our waters and in what abundance. Much information of this kind is available through the activities of fishermen and others but this must be extended and refined through biological exploration. The Board's biologists have done a good deal of exploratory work in recent years to discover, if possible, unknown populations of valuable species. As a result of studies in the Northwest Territories, Great Slave Lake has been opened to commercial fishing and yields of over seven million pounds of whitefish and trout a year have been taken. The serious decline in the yield of goldeye has been to some extent replaced by the Board's finding of a large unused population in Lake Claire, Alberta. The Newfoundland Station was responsible for the discovery and exploration of large commercial quantities of American plaice and cod down the whole eastern edge of the Grand Bank. Local trawlers that followed the research vessel into the area enjoyed profitable fishing. Seven million pounds of rosefish have been taken since their discovery in Hermitage Bay by the research vessel of the Newfoundland Station in 1947.

An inshore fishery for winter flounders has been established in St. Mary Bay, Annapolis Basin and Minas Basin as a result of exploratory dragging by the St. Andrews station. The same station played an important part in establishing since 1940 an Irish moss industry with an annual production exceeding $250,000. Search in the Eastern Arctic for additional sources of food for the Eskimo population has uncovered cod in some numbers in the Port Burwell area of Ungava Bay.

Studies of Fish Stocks:

Study of the size of the stocks or populations of the various species in different areas constitutes an important part of the Board's work. One estimate of the population at a single point of time is not enough. It is necessary to know whether the population is changing, and in case it is decreasing to know whether the decline is due to overfishing or to other causes. In the case of important fisheries it is necessary to follow every year changes which occur in the character of the populations being exploited. An experiment is being carried out in the waters off Vancouver Island to determine whether a quota system or unrestricted fishing will give a greater yield of herring over a period of years.

Fisheries that are being studied for the purpose of detecting changes in abundance due to fishing include the cod, haddock and other groundfish off the Atlantic coast. Fishermen of many countries, including the United States and several European countries (France, Spain, and Portugal), fish the Grand Banks and waters even nearer Canadian shores. Some believe that overfishing is taking place and that there should be international action for the control of fishing. Canada's stake in these fisheries is so great that reliable information must be obtained by the Board as a basis for action.

The populations of the five species of Pacific salmon have been followed for many years, as well as the pilchards off the British Columbia coast and the scallops in the Bay of Fundy. A study of the harp and hooded seals which support the seal fisheries of Newfoundland and Quebec is being undertaken to provide reliable information as a basis for regulations to assure the maximum long-term yield.

Disease Studies:

Disease is one of the factors reducing populations below what would otherwise exist. Comparatively little is known concerning the extent to which disease normally reduces the size of populations in nature. Occasionally epidemics occur which decimate or wipe out populations. Epidemic disease is most often observed where animals are cultured under artificial or semi-artificial conditions resulting in crowding above densities which normally occur in nature.

Disease studies with which the Board's scientists have been concerned include disease among lobsters in pounds, among oysters and in eelgrass. The role of disease in reducing populations in nature is one which must receive a great deal more attention in the future.

Increasing Production:

Apart from managing the fishery so as to assure the maximum sustained yield, the only means of possibly increasing production is to make conditions more favourable for hatching, survival and growth. Techniques to this end being developed by the Board include oyster farming, pond culture as of trout, reduction of competitor and predator species, increasing productivity of waters by fertilization, increasing areas for spawning and growth under natural conditions, and through hatcheries. It is only in smaller bodies of water that it is yet possible to modify conditions to increase production. This largely limits efforts in this direction to fresh waters.

Optimum Size:

The size to which fish should be allowed to grow before being caught presents a basic problem in fishery management. Decision on this point involves consideration of rate of growth and death rate. If it is possible to catch 100 fish at a size of two pounds for every 50 fish that can be caught if they are allowed to grow to a size of three pounds, it is obviously better, other things being equal, to take them at the smaller size.

Growth rate can be determined fairly easily for most species but mortality rates are much more difficult to obtain. In the case of lobsters it has been possible through tagging and recapture to get much more definite information than has yet been possible for most other fisheries. For instance in one area in Cape Breton Island lobster fishermen increased their catch by 75 per cent two years after the size limit had been increased from seven to nine inches. Similar knowledge is being sought for scallops and other fisheries. Such information is applied in the management of the fishery through width of space between laths in lobster traps and in size of mesh in nets.

Oceanography:

Poor fishing is not always due to scarcity of fish. The fish may be as abundant as ever but if fishermen are unable to find them or are unable to catch them in sufficient numbers, fishing is unprofitable. Fish are known to be influenced in their movements and occurrence by such conditions in the sea as temperature, salinity and currents. For example, haddock on the Grand Bank in March and April, 1948, were in deeper water than in 1947 and this corresponded with temperature differences in the two years. Off the west coast of British Columbia preliminary observations suggest that the distribution of albacore tuna is determined by temperature. The Eastern Arctic Fisheries Investigation has as one of its main objectives the increase in food supplies for natives of the region. Information on hydrographic conditions in the area is considered fundamental to efforts at locating or conserving food animals.

Through the Canadian Joint Committee on Oceanography, research of importance both to the Royal Canadian Navy and the Fisheries Research Board is carried out through a co-operative programme in which assistance is given by the National Research Council and the Hydrographic Service.

Prediction:

Predictions of probable changes in abundance of certain kinds of fish are now being made with some success. Knowledge as to the size of future populations is of great value to the industry. It must be realized, however, that attempts to predict both the abundance and the movements of fish are attended by many pitfalls and those for whom they are made must realize that as yet they are little more than informed guesses as to what is likely to occur. It is anticipated that, with the increase of knowledge and experience, fisheries prediction will become more reliable and play an increasing part in Industry's planning.

One of the means used in forecasting probable future abundance of a species in a given locality is to gather information on the strength of oncoming year-classes. An unusual abundance of young hatched in a particular year, leads to the assumption

that when that year-class has reached the size at which it would enter the fishery good fishing should result. Based on this kind of evidence predictions as to size of fish and abundance are now being made for the various populations of Pacific herring in advance of the fishing season.

Another type of forecasting is illustrated in the case of pink and chum salmon. It has been found that the amount of stream flow during the time the eggs and young are in the river is correlated with the number surviving to return as spawning adults. Prediction of the time of settlement of oyster spat has long been a regular service of the Board's oyster station at Ellerslie, P.E.I.

Technological Investigations

The sum of $388,000 or 30 per cent of the Board's expenditure was devoted to the work of the Experimental Stations. The object of the work is to maintain an ever higher level of quality of fishery food products, to improve methods of processing and preserving fish, to study the nutritive value of fish and to increase the range and value of fish by-products for food, medicinal and industrial use.

Spoilage:

Fish is in its most edible form fresh from the sea. It has long been recognized that under ordinary circumstances the fresh tang of the sea is soon lost and deterioriation progresses rapidly to frank spoilage. The delivery of high quality fish and other sea products to markets, frequently far distant from the source, involves a wide range of scientific problems.

The reasons for the loss of flavour and rapid spoilage have been partially understood for many years. The Board's technological stations are making important contributions to rapidly accumulating knowledge of the process involved and of methods of control. Work has been in progress in the experimental stations for several years on the most efficient methods. Cooling has long been used as the primary procedure or the main procedure. Re-examination of the cooling processes has indicated many opportunities for improvement. Studies have been made on commercial fishing vessels, including icing techniques in insulated and non-insulated vessels and in a mechanically-cooled vessel. The results have been sufficiently conspicuous that the principles are being incorporated in the adoption of new icing techniques and in the possible design of a new class of trawlers to be built in Canada.

During the year it has been shown that a great improvement may be made in keeping quality of fillets or other cut fish by rapid cooling after thorough washing by mechanical means. At the same time much fundamental work has been carried out on early spoilage changes particularly on the penetration of bacteria through the tissues and their effect on the breakdown of proteins.

Frozen Fish:

In the case of frozen fish it has been widely recognized that rapid freezing is of importance. Good progress has been made in the development of an air flow freezing process. This appears to give results which compare with plate freezing procedure, and perhaps at lower cost. Moreover the method appears to be applicable to round fish as well as fillets or steaks.

It has been clearly established that there is a definite relationship between storage temperature and quality. The maximum temperature allowable for the maintenance of high quality varies with the type of fish and the storage period. This raises important questions pertaining to low temperature storage and transport. Good progress has been made during the year on the development of mechanically refrigerated rail cars. A year ago mechanical refrigeration units were adapted to a railway car provided for the test by the Canadian National Railways. The initial trial runs across the continent demonstrated the equipment to be capable of maintaining the desired temperatures.

Salted Fish:

Much has been done in recent years on the development of a fish dryer for heavy-salted fish. This equipment now in wide use is operating successfully. During the year work for the most part has been limited to conditions of drying light-salted fish and to the supplying of technical advice where requested. The most important work on dried fish this year concerns conditions of storage. It has been shown that the maximum limits of storage conditions for the retention of reasonable quality are 80 degrees F. and a relative humidity of 70 per cent. These are not desirable storage conditions but if these limits are exceeded there are marked changes in the fish.

Studies on the factors affecting the cure are being made such as the specific bacteria which influence colour and flavour and the physical and chemical effects on the flesh proteins. These have an important practical application in brining fillets and open the way to a better understanding of the changes which occur in hard salting.

Smoking and Canning:

Air conditioned smoke tunnels and smoke producers developed some years ago continue to be widely used both in this country and elsewhere. During the year work in this field has been limited to technical advice and some redesigning to fit special requirements. Considerable work has been done on improvement of the quality of kipper snacks. It was found that steaming the fish and drying the surface under infra red lamps prior to smoking considerably improved the flavour.

Nutritive Value of Fish Tissue:

Much information has been accumulated on the nutritive value of the flesh of various species of fish. During the last year, much work along this line has been on the presence of special nutritive factors in fish and fish products. Work on the amino acid content of a variety of fish products has been completed and the results published in the Board's Journal. Extensive assays have been made for vitamin B_{12}, the "animal protein factor" in fish and fish products. This factor (or factors) now recognized to be essential for proper growth of animals and man is available from a variety of sources. This analysis indicates that it is present in large amounts in the livers of several species of fish, in condensed solubles, stick water and fish meals, especially whole herring meal. Knowledge of this occurrence should enhance the accepted value of these products.

Marine Oils:

One of the more important technological contributions of the Fisheries Experimental Stations has been in the development of medicinal oils. At the height of this work the Board published a bulletin on the chemistry and technology of marine oils which has been widely used. Developments in oil chemistry have necessitated a revision of this bulletin. It is now being printed.

New and enlarged sources of marine oils and other new sources of vitamins A and D make it highly desirable to find new approaches to the utilization of these important by-products. Fundamental studies of the chemistry of marine oils were undertaken and one practical outgrowth is a new method of extracting oil from fish livers. The method is highly efficient on laboratory and small pilot plant scale. Commercial scale equipment has been constructed and will be in full operation early in 1950.

In the non-medicinal oil field, work has been largely centered in herring, whales and seal oils. An investigation of the polymerization of herring oil shows good promise that a product comparable with that used in the Norwegian canning industry may be developed. Hydrogenation of herring oils has yielded a highly palatable solid oil of the margarine type. Work done on the purification of seal oil has been extended to studies on stability and hydrogenation.

Utilization of Fish Wastes:

Considerable work is in progress on the economics of the recovery of a variety of fish by-products. Recovery of the crude products in processing plants entails principally labour costs. This has been assessed in terms of the sales value of the products. Work is now under way on methods of processing certain of these raw products. By-products which have received particular attention during the year include protamine from salmon milt (used in insulin preparation and other pharmaceuticals), enzymes from salmon pyloric ceaca (used in tanning and other purposes), insulin from halibut, lingcod and whales, decolorizing carbon from herring scales, glue, etc.

THE FISHING INDUSTRY

CANADIAN fisheries and the Canadian commercial fishing industry ended the year 1949* in a generally sound economic position. Although total landings of 1,316 million pounds (excluding Newfoundland) were 119 million pounds lower than 1948, prices remained high and fishermen's incomes were not greatly affected. The catch had a landed value of $67·1 million compared to $63·1 million in 1948. The marketed value was $133 million (exclusive of Newfoundland), about $6·5 million less than the 1948 figure. Newfoundland's catch added more than 585 million pounds to the total catch and $33 million to the total marketed value, bringing Canada's total 1949 fish product sales to $166 million.

Major item in the overall decline was the British Columbia herring catch. Atlantic herring and sardine catches also suffered a decline. British Columbia's salmon fisheries, with total landings of 144 million pounds, made slight gains over the preceding year, due principally to the large catch of the pink variety.

In Newfoundland, the record lobster catch of 1948 was surpassed in 1949 when some 4 million pounds were landed. Cod fisheries showed an important increase, as did other varieties of groundfish, and salted codfish production was at high levels. On the other hand the Newfoundland 1948–49 fall and winter herring fishery was the smallest in many years.

Exports of all fisheries products from Canada (including Newfoundland) declined by about 12 per cent. In 1948, Canada and Newfoundland together exported to other countries a record total value of $120·4 million of fish and fishery products. In 1949, this total had dropped to $106·2 million, this decline being due to a lower catch and to some slowing down in the marketing of certain forms.

Analysis of Exports

Analysis of the exports of fisheries products is complicated somewhat by the entry of Newfoundland into Union at the end of the first quarter. The export statistics for 1949 show total fishery exports of $100·2 million. This includes $14·2 million worth which was exported directly from Newfoundland ports during the last nine months of the year. Consequently, exports from the nine older provinces amounted to approximately $86 million as compared to $89·8 million in 1948, or a decline of approximately four per cent.

Looking at the market situation from the standpoint of the countries which import Canadian fishery products, marked changes are evident from the pattern of the previous year. The United States bought $67·2 million in 1949 compared with $70·1 million in 1948. Though American imports declined slightly (mainly due to reduced purchases of groundfish fillets, etc., which were not compensated for by the increases in other items), the United States portion of total exports rose

**Throughout this chapter, all statistics are on a calendar year basis.*

from 58 per cent to 63 per cent, signifying an increased dependence on purchases by the United States market. The American dependencies such as Puerto Rico also decreased their purchases somewhat, from $5·6 million to $4·7 million.

The United Kingdom increased its imports from $2·3 million to $8·2 million, due entirely to the E.C.A.-financed shipments of canned salmon. The dependent areas of the United Kingdom (chiefly the British West Indies) bought at slightly higher levels than in 1948 (at $7·5 million as compared with $7·4 million) despite pressure to cut down purchases from dollar sources. The Union of South Africa, which had imported almost $3·5 million of Canadian fish (chiefly canned salmon and sardines) prior to imposition of import controls in all fishery products in November of 1948, allowed in only $90,000 worth in 1949. On the other hand, the other sterling countries such as Australia, New Zealand, India, etc., imported almost $0·5 million worth, a slight relaxation from the stricter controls of the previous year when only $0·16 million worth was bought.

Dependent upon the resourcefulness and energy of Canada's fishermen a large industry is engaged in the processing, storing and marketing of fish and fish products. This part of the fishery provides employment for large numbers of workers in many centres throughout the Maritime Provinces, Newfoundland and British Columbia. It purchases raw materials used in fish processing, building materials, salt and other ingredients used in curing and preserving fish.

Both the primary industry and the secondary industry in the war and post-war period improved their position as a result of the greater demand for fish and other foods. Within the past year however, there have been indications that as the urgent needs became fulfilled and as fishing of other countries increased in activity the fisheries of Canada would have to devote greater attention to producing what the consumer wanted at competitive prices.

The industry has taken steps to overcome some of the difficulties that have materialized. Plants have been renovated, new processes adopted and new machinery installed; new methods of packaging and marketing have been devised and steps taken to explore additional outlets both at home and abroad for fishery products.

British Columbia

The high level of total marketed value which the fisheries of British Columbia have yielded over the past few years was relatively well maintained in 1949, when the many varieties of fish products brought $56·4 million, approximately $2 million less than in 1948. The catch totalled 520 million pounds. Principal items in the 1949 fish product marketed values are as follows:

Salmon	$35,894,000
Herring	9,412,000
Halibut	4,037,000
Tuna	708,000

In a year that was of more than ordinary interest from the industrial point of view, the fishing effort was carried on at an average level and results, on the whole, were of a satisfactory nature.

The industry began the year with the problem of the disposal of a large carry-over of unsold canned chum salmon from the 1948 pack. The Associated Canners of British Columbia launched an advertising campaign to increase sales of canned salmon on markets within the Dominion. By the close of the year the results were regarded as highly encouraging, and at the commencement of the 1950 season stocks of unsold British Columbia canned salmon had been reduced to a low level. The sales efforts of the industry were augmented by the Department's own programme of publicizing Canadian fishery products in domestic and foreign markets.

Another important marketing feature was the purchase by the British Government of 410,000 cases of the 1949 pack. Under this special arrangement the canners delivered 60,000 cases of sockeye, 65,000 cases of Group 2 (cohoe, red spring, steelhead and blueback), and 285,000 cases of pinks to the United Kingdom. Furthermore, the slow but steady decrease of foreign currency restrictions which had hampered export sales in post-war years was beginning to show favourable reaction in the sale of some canned salmon to such markets as Italy, Belgium, and others.

The relinquishing of Wartime Prices and Trade Board fish oil controls in 1948 made itself felt in the herring fisheries of 1949. Considerable quantities of vegetable oils had been imported from the United States and this resulted in a drop of 50 per cent in prices obtained for British Columbia herring oils.

The catch of tuna fish was the highest in the history of this newly developed fishery but the difficulty experienced in the marketing of the previous year's catch, arising mainly from high production costs, resulted in lower prices being paid to fishermen and a lower overall marketed value.

Salmon:

The year marked the convergence of some light cycles of some varieties of salmon in various areas, and special conservation measures were put into effect. The canned pack totalled 1,436,464 cases, as against the 1948 pack of 1,308,137 cases. The relatively satisfactory catch and pack of salmon were due principally to the volume of runs of pink salmon, of which 55 million pounds were taken.

In the northern sockeye fisheries, there was a run of average volume to the Skeena, and a somewhat disappointing run to Rivers Inlet. In the Fraser river area a large early run of sockeye appeared and being protected by the special conservation measures of the International Pacific Salmon Fisheries Commission passed to the spawning grounds unmolested. The later runs to the Fraser contributed to the overall pack, which reached 259,821 cases, a figure somewhat below average.

The catch of cohoe salmon was one of the best for some years and the canned pack of 208,420 cases compared favourably with the average of 178,283 cases over the past three years. In addition to the canned product a considerable portion of the catch was processed and marketed as fresh and frozen fillets.

The proportion of catch derived from net fishing operations was larger than usual, with lesser returns from trolling activities in certain areas.

A pack of 709,992 cases of canned pink salmon was produced, a satisfactory uptrend from the 1947 cycle, which yielded 321,721 cases. Runs were better than expected in the northern areas, particularly in the Butedale region, where there was an increase of approximately 60 per cent over the catch from the brood year. A good catch also was taken from the Johnstone Straits area. The pack of pink salmon from fish caught in District No. 1 (Fraser) amounted to 80,764 cases, compared with 103,953 cases in the brood year. A large part of the Fraser run is taken by United States Fishermen in Puget Sound waters, as well as by seiners from both countries in Juan de Fuca Straits and outside waters.

While the canned pack of chums, 227,737 cases, was comparatively low, the catch was satisfactory, as a larger proportion was marketed in other forms. A ten-day tie-up of net fishermen in Johnstone Straits occurred during the beginning of the chum run in that area. The market for canned chums was still in an uncertain condition. As the season developed large quantities were frozen and marketed in Canada, and heavy shipments of fresh chums were exported to the United States. As in previous years, there was intense concentration of fishing activity to exploit this variety, particularly in the Johnstone Straits area, where a peak gathering of 600 gillnetters and 150 seines reached a high mark in the history of this fishery. In the northern areas results were somewhat below those of the past three years. Salmon of all species taken by the Indians of the province for food supplies, under free permit, totalled 384,564 fish.

Halibut:

As in previous years, the halibut fishing season opened on May 1, with a catch limit of 25·5 million pounds in Area No. 2. The limit was quickly reached and halibut fishing in this area was closed at midnight on June 3. In Areas 1A, 3 and 4, closure was effected on July 12, after which date all direct halibut fishing ceased. Landings at British Columbia ports totalled 22·2 million pounds, of which 17·9 million pounds were caught by Canadian vessels.

Herring:

A total of 172,273 tons of herring was caught and processed, being the second highest calendar year catch in the history of this fishery. The highest catch was made in the previous year, when more than 208,000 tons were landed. However, being based on returns for the calendar year, these figures take in the spring catch of one season and the fall catch of the ensuing season. Actually the 1949–50 herring season produced the largest catch on record but some of its results will appear in the 1950–51 annual report.

Quotas laid down in the Special Fishery Regulations governed the catches in all areas of the province, with the exception of the west coast of Vancouver Island. This programme of administration is being carried out in conjunction with continuing coastwide studies and investigations by the Fisheries Research Board.

Despite efforts made by the industry to retain some of the markets for canned herring which developed during the war, the demand declined and the total pack of 75,342 cases, with a value of $413,000 was the lowest since 1938. This made

a considerable difference in the overall value of the herring catch, since the big wartime packs of canned herring yielded several million dollars annually. The total marketed value of $9·4 million was lower by approximately one million dollars than that of 1948, when a canned pack of 408,700 cases contributed $2·5 million. Herring meal prices remained firm but a 50 per cent decline in prices for fish oils was an adverse factor in this fishery.

The production of dry salt herring, which resumed with small shipments to Oriental markets in 1948, was continued with shipments totalling 5·9 million pounds.

Grayfish:

The year probably marked the end, for the time being at least, of important fishing operations for grayfish. Its extent, over a course of years, was of brief duration. Until 1938 the species was regarded as a pest, by reason of the damage it inflicted on nets and on salmon caught in nets. For a time grayfish were used in the manufacture of fish meal and oil—the whole carcass being utilized—but the operations were never on a large scale. The development of vitamin products which took place in the previous decade was reflected in British Columbia fisheries when it was discovered that the liver of grayfish was an important source of vitamin A. In 1938 a fishery developed for the catching of grayfish and the extraction therefrom of the livers.

For the ensuing years large quantities of grayfish livers were landed annually and this branch of the industry made important contributions to the incomes of British Columbia fishermen, and to the total marketed value of fish products. Early in 1949 the situation began to change. Considerable quantities of Japanese vitamin livers were imported into Canada and the United States. Furthermore, a "synthetic" vitamin A was introduced on this continent at a cost far below that of the grayfish liver. The result was a sharp decline in prices. Towards the end of the year manufacturers of vitamin A from grayfish livers were faced with heavy losses, and one of the six liver refining plants in British Columbia had ceased operations. The future of this branch of the industry is now somewhat uncertain.

Anchovies:

The entire catch of 431,500 pounds of anchovies and related species was canned, producing the equivalent of 2,697 cases of 48 one-pound tins. This is the smallest catch and production for several years. Difficulty was experienced in locating schools of fish which could be used acceptably in required processing and this was the primary reason for the lower output.

Whales:

Whales were relatively abundant in northern waters and a catch of 255 of these mammals was the result of whaling operations. A number of technical improvements were made at the whaling station at Coal Harbour, Quatsino Sound. It is interesting to note that last year's whale catch included two of the somewhat rare Blue whales, both of which were more than 70 feet in length.

Tuna:

The fishery for albacore tuna of the North Pacific, the most recent species to attract a large scale development in Canadian fisheries, continued to show encouraging signs. The catch of 2·2 million pounds was the greatest since this fishery began in British Columbia. The marketed value of $708,000 was considerably below that of the previous year, the experience of which apparently indicated that lower production costs were essential if there were to be reasonable development of this fishery. It was the third year in which landings of more than one million pounds of tuna have been made.

Much has yet to be learned of the yearly movements of this species. In 1945, when the first British Columbia tuna landings exceeded one million pounds, the bulk of the catch was taken in waters off-shore from the coasts of Vancouver Island, Washington and Oregon. In 1948 the greater proportion of the 2·1 million pounds of albacore tuna landed was caught off the west coast of the Queen Charlotte Islands. In 1949 this fishery was almost entirely centered off the west coast of Vancouver Island.

The policy of exploratory patrols, initiated by the Department in 1948, was continued in 1949. Early in the year meetings were held with tuna fisherman in Vancouver, Prince Rupert, and Victoria. At these gatherings the experience gained from previous years, both by fishermen and the Department's fishery patrol services was discussed together with data obtained. Plans discussed at the meetings were carried out during the summer and much valuable knowledge was added to that obtained in the previous year.

Fishing and Processing Operations:

The trend towards modernization in all branches of the industry which was indicated last year, continued in 1949.

Many new fishing vessels and packers were built, most of them installing modern fishing devices. Gill-net boats are now being designed for greater ease in handling nets. Numbers of this type of craft have installed echo sounders which have proved highly successful. Last year a number of trollers were fitted with devices suspended from midship trolling poles on either side of the vessel. These act as stabilizers during trolling operations in heavy weather. Direction finding sets, radiotelephones, and automatic pilots continue to be added to all classes of fishing craft. The former tendency to change over from gasoline to diesel engines in vessels of the ten to 20-ton class is continuing to undergo reversal. In recent years many vessels of this class have had diesel power replaced by specially designed marine gasoline engines. These are quieter and more flexible; an important factor in trolling operations.

The industry took advantage of the technical improvements developed by the Fisheries Experimental Station at Vancouver. Some companies have installed in freezing and packing plants the ascorbic acid dip tank, for processing fillets and fish steaks, which was designed and modelled by the Station. The packaging of fish fillets has been facilitated by installation in some establishments of mechanical wrapping machines. A northern plant installed a new smoke house unit under the direction of an officer from the Station, who designed the unit.

The Inland Fishery

Canada's important inland species are lake trout, pickerel, whitefish, tullibee, saugers and pike. About half the production comes from the Great Lakes of Ontario, one quarter from the lakes of Manitoba and the balance from Quebec, New Brunswick, Saskatchewan, Alberta, Yukon and the Northwest Territories.

The inland freshwater fishery in 1949 yielded total landings estimated at 86 million pounds. The marketed value was $16·5 million. Exports of freshwater fish were valued at $14·1 million as against $13·6 million in the previous year. The increase was accounted for by a 30 per cent increase in exports in the filleted form.

Ontario's production of fish amounted to about 30 million pounds, somewhat higher than in 1948. Blue pickerel accounted for about 8 million pounds; whitefish accounted for about 6 million pounds and pickerel (yellow pike) for about 3 million pounds. Manitoba's catch totalled 16·6 million pounds, with pickerel (yellow pike) accounting for about 4 million pounds and whitefish for about 3 million pounds.

Landed value was, in the aggregate, higher than last year. Prices paid to fishermen in Ontario and in Manitoba, were, however, about 10 per cent less. As a rule freshwater fish are marketed in the fresh and frozen state. Production of fillets was about 65 per cent above that of the previous year.

With the increasing of the catch limit at Great Slave Lake in the Northwest Territories to 9 million pounds, this body of water became established as the largest producer of whitefish and lake trout in Canada. Total catch of whitefish, lake trout and inconnu, during 1949 was more than 9 million pounds. This figure, which is in round weight terms, includes landings of the winter season, January 1 to March 31, 1949, as well as the summer season and the winter season, December 1 to 31, 1949.

These fish were marketed as follows: 4·6 million pounds fresh dressed; 2·1 million pounds frozen dressed; 208,100 pounds fresh round; 449,500 pounds frozen round, and 624,100 pounds of fillets. Landed value totalled $517,784 and the marketed value was $2·1 million.

Some difficulty was encountered in marketing the catch during the summer season owing to the failure of a portion of the Grimshaw-Hay River road and losses to the industry were estimated at $100,000 owing to trucks becoming stuck and the fish spoiling before reaching railhead. It was found necessary to close the lake to commercial fishing for approximately one week while the road dried following a series of very heavy rains which made one portion virtually impassable.

The Maritime Provinces

The fisheries of New Brunswick, Nova Scotia and Prince Edward Island showed a downward trend of a little more than six per cent in catch for the year but the industry was in a sound condition. Use of mechanical equipment by the inshore fishermen increased as a larger number of boats and small vessels were licensed to use otter trawl gear.

Preparation of the catch for marketing showed a small increase in the quantity cured by salting while the decline in canning, noted in 1948, continued. The

quantities marketed fresh continued on about the same level. There was a total catch of about 576·9 million pounds, valued at $26·1 million at the boat side, a decrease of 39·3 million pounds in catch and $1·8 million in value. Landings of sardines and herring in New Brunswick were about 35 million pounds lower, which with seasonal variations and reduced landings in other provinces, made up to the total decrease. Price of the varieties of what might be called staple articles, cod and similar species, herring, mackerel and sardines, dropped while the prices for the choice varieties such as lobster, salmon and halibut, were on the same level at 1948. Marketed value for all species was estimated at $55 million.

Landings and Landed Value by Provinces

	1949	
	Catch Pounds	Landed Value
Nova Scotia	362,038,600	$17,957,164
New Brunswick	186,854,900	6,104,492
Prince Edward Island	28,022,500	2,064,117
	576,916,000	$26,125,773

	1948	
	Catch Pounds	Landed Value
Nova Scotia	364,531,200	$18,410,530
New Brunswick	220,620,300	7,385,759
Prince Edward Island	31,081,300	2,165,096
	616,232,800	$27,961,385

The catch in Nova Scotia showed a small decrease and the landed value reflected the reduction in prices. The large decrease in catch for New Brunswick was in sardines and herring. In Prince Edward Island the decrease in catch was in hake, herring and smelt, but as the main revenue is from lobster, in which the catch increased, the difference in value is small.

The lobster catch was 35·8 million pounds, about 2 million pounds greater than 1948 and the landed value was $9·7 million about $500,000 higher. The landings of groundfish such as cod, haddock, hake and pollock totalled 265·5 million valued at $8·3 million, a decrease of 34·6 million pounds and $1·6 million in value from 1948. Greatest decline was in Nova Scotia, with smaller landings in Prince Edward Island compensated by an increase of 2 million pounds produced by the fleet of small draggers in northern New Brunswick. Greatest part of the catch was made by vessels on the offshore grounds.

Fish taken inshore by nets, traps and weirs include sardines, herring and mackerel. The catch was 179·9 million pounds, valued at $3·2 million, a decrease of 24 million pounds and $793,000 in value from 1948. Sardine landings dropped 27·7 million pounds; herring landings dropped 8 million pounds while spring mackerel landings in Nova Scotia increased by 11·7 million pounds.

Landings of halibut, plaice, yellowtail and witch flounders were 13·4 million pounds, valued at $1 million, an increase of 4·5 million pounds. Landings of halibut were 4·1 million pounds, about twice that of 1948. The total catch of oysters, soft shell clams, bar clams, quahaugs and scallops was 33·7 million pounds, valued at $1·05 million, an increase of 6·47 million pounds compared to 1948. The quantity of all kinds of clams increased but scallop landings dropped by about 1·2 million pounds, and oyster production remained about the same at about 54,000 barrels.

Canned Products:

There was a sharp decrease in canned products, the total being 801,000 cases compared to 1·2 million cases in 1948. All kinds except clams, were lower. The greatest decrease was in sardines, 596,000 cases being packed compared to 858,000 cases in 1948. There was an increase in the production of fresh clam meats and of fresh lobster meat. Some 285 factories were licensed compared to 314 in 1948.

Marine Plants:

The harvest of Irish moss, kelp, dulse, and other marine plants was 11·8 million pounds, valued at $137,000—the greater part being Irish moss collected and shipped from Prince Edward Island.

Newfoundland

In most branches of the fishery, during 1949, production was greater than in the preceding year and the marketed value of all products was estimated at $33 million. The successful marketing of herring, salmon, lobsters, and frozen groundfish was maintained but competition brought about by the increased capacity of European fishing fleets, together with the limitation which a number of countries have placed on imports from dollar areas and currency difficulties generally had a marked effect on the export marketing of salted codfish. Prices for fish oils declined sharply during the year and no immediate improvement in the position can be foreseen. The seal and whale fisheries were prosecuted successfully but catches did not reach the 1948 level. Statistical data on the fisheries were collected but due to a shortage of staff it was not possible to provide complete coverage. This service is being enlarged to provide completed statistical information for the whole of Newfoundland and Labrador. Trade representatives were maintained in Puerto Rico, Jamaica, Italy and Portugal.

Salted Codfish:

Production of salted codfish for 1949 was about 1·05 million quintals (quintal: 112 pounds) dried weight as compared with 940,000 quintals in 1948. The increase can be attributed mainly to record catches obtained during the trap netting season in certain sections of the north east coast, particularly in Notre Dame Bay. The deep sea fishing did not prove as successful as usual and a number of vessels abandoned the voyage early in the season because of low catches. Later in the year, the shortage of squid for bait also had a detrimental effect on both inshore and deep-

sea fisheries. Ice conditions on the Labrador Coast hampered fishing operations during June and July but fish were plentiful until the second week in August when a severe storm struck the coast, doing extensive damage to fishing property and gear. Final production figures, however, showed a slight increase in the Labrador catch as compared with that of the previous year.

	1948			1949		
	No. of Schooners	No. of Men	No. of qtls. (dry)	No. of Schooners	No. of Men	No. of qtls. (dry)
Inshore		23,145	610,000	.....	22,200	735,000
Deep sea	103	1,265	144,000	88	1,170	120,000
Labrador	131	3,590	186,000	144	3,388	195,000
Total		28,000	940,000	.....	26,758	1,050,000

The export marketing of salted codfish was again handled by the Newfoundland Associated Fish Exporters Limited, a co-operative export marketing group, who have been given the sole right, subject to certain conditions, to export Newfoundland's production of salted cod and related species.

Meetings convened by the Newfoundland Fisheries Board between representatives of fishermen, Government and trade, were held in St. John's during May and September, to consider prices to be paid fishermen for salted codfish for 1949 production, as well as other matters pertinent to the industry. It was agreed that the final minimum prices to fishermen decided upon for the 1948 catch of Shore and Bank fish would remain in effect. In the case of Labrador Cure, however, it was felt that the marketing position was not sufficiently clear to permit the representatives of the various bodies to settle prices to fishermen. It was decided, therefore, that Labrador fish could be taken in on open receipt with appropriate advances to fishermen but if outright transactions were entered into, the prices should not be less than those paid to fishermen for 1948 production.

Frozen Fish:

The total production of frozen fillets and round fish was 25,150,719 pounds as against 25,546,381 pounds produced during 1948, made up as follows:

	1948 (lbs.)	1949 (lbs.)
Cod	14,454,930	9,889,649
Haddock	8,047,988	8,353,625
Rosefish	2,159,195	4,971,525
Flounder	640,775	1,238,470
Greysole	121,155	494,339
Halibut	68,548	144,016
Catfish	46,525	54,855
Hake	6,330	4,240
Yellowtail	935	—
Total	25,546,381	25,150,719

While the total production was somewhat less than that of the preceding year, there was a substantial increase in frozen groundfish, other than cod. This may be partially accounted for by the larger number of draggers operating. The United States continued to be the main outlet for Newfoundland's frozen fish production although appreciable quantities were sold to the Canadian mainland.

Herring:

During recent years, the herring fishery has grown to comparatively large proportions, due to the exceptionally high demand for pickled herring for relief purposes. This demand has come to a standstill since adequate supplies of pickled fish can now be obtained from soft currency areas. No relief contracts with Newfoundland were therefore entered into in 1949. The 1949–50 fall-winter herring fishery was one of the smallest for many years. The Scotch Cure, pack, which normally ends at the end of January, was particularly affected and less than 6,000 barrels of a contracted quantity of 16,000 barrels, were packed.

Salmon:

The quantity of fresh and frozen salmon produced was higher in comparison with the preceding year. This increase was particularly evident in the Labrador salmon fishery. The production of both canned and pickled salmon, however, showed a decrease.

Comparative figures are as follows:

	1948 (lbs.)	1949 (lbs.)
Fresh and Frozen	2,500,000	3,000,000
Pickled	188,495	150,000
Canned	390,336	190,848

Lobsters:

Actual shipments of live lobsters amounted to approximately 4·15 million pounds as compared with about 3·58 million pounds in 1948. The quantity canned totalled 3,882 cases (36 pounds net weight each) as compared with 4,372 cases during the 1948 season. The quantity of canned lobsters produced in recent years has steadily decreased due to increased facilities available to fishermen to dispose of their catches alive.

Seals:

Although efforts were not made to prosecute the seal fishery on the same scale as 1948, nevertheless total catches differed by only 6,500 seals.

	1948	1949
Steamers	4	2
Auxiliary Vessels	21	13
Men	1,035	670
Total Catch (number of seals)	141,971	135,446

Meetings to discuss matters in connection with the seal fishery were held at St. John's early in December. The whole question of the sealing industry and its international aspects, its exploitation and conservation was discussed and valuable information gathered on the habits and movements and estimated size of the seal herds. Two fisheries officers were sent to the icefields to tag seals and gather certain information for scientific study. Aircraft was again used to detect seal herds, and information relative to location and size of patches sighted was relayed direct to vessels.

Whales:

Two whale factories were in operation using six whale-catching ships. These factories are located at Williamsport and Hawkes Harbour. The season opened up exceptionally well but operations were hampered considerably from August onwards by adverse weather conditions.

	1948	1949
Number caught	756	542
Ordinary Oil (gals.)	1,198,470	890,690
Sperm	32,172	135,080
Guano (lbs.)	4,902,604	3,695,522

Marine Oils:

Since 1943, the total production of Newfoundland marine oils, with the exception of refined cod liver oil, has been allocated annually to world markets by the Combined Food Board and latterly by the International Emergency Food Council. International allocations were discontinued in February, 1949, and trade was resumed on normal lines. A contract for 100,000 gallons desterinated medicinal cod liver oil was arranged by the Fisheries Board with the United Nations International Children's Emergency Fund and shipments under this contract commenced in August.

APPENDIX

FINANCIAL STATEMENTS, 1949-50

COMPARATIVE SUMMARY OF EXPENDITURES, 1949-50

Appropriation	Expenditure 1949–50	Expenditure 1948–49	Increase or Decrease
ORDINARY EXPENDITURE			
Departmental Administration	$ 361,575.25	$ 288,614.67	+ $72,960.58
Minister's Salary and Motor Car Allowance	12,000.00	12,000.00	.....
Statutory—Civil Service (Death) Gratuities	940.00	400.00	+ 540.00
Fisheries Inspection, including Fishery Officers and Guardians, Fisheries Patrol and Protection Service	2,802,930.95	2,276,440.82	+ 526,490.13
Educational Extension Service, including grant of $3,000 to Lunenburg Fisheries Exhibition	78,266.16	129,802.95	− 51,536.79
Fish Culture Development	548,751.47	330,589.49	+ 218,161.98
Oyster and Clam Culture	56,657.09	45,875.96	+ 10,781.13
Fisheries Research Board of Canada—			
Operation and Maintenance	1,278,383.42	954,217.31	+ 324,166.11
Construction and Improvements	103,711.06	201,148.94	− 97,437.88
International Fisheries Commission (Halibut)	34,745.55	26,138.59	+ 8,606.96
International Pacific Salmon Fisheries Commission	124,934.45	98,250.20	+ 26,684.25
International Pacific Salmon Fisheries Commission—Hell's Gate	57,874.10	127,260.62	− 69,386.52
Processing Fur Seal Skins	484,732.52	445,775.92	+ 38,956.60
To provide for destruction of Harbour Seals	19,918.38	22,997.07	− 3,078.69
Fishing Bounty	159,215.85	158,177.55	+ 1,038.30
Administration Expenses, Newfoundland Fisheries Board	290,081.96	.....	+ 290,081.96
Bait Service, Newfoundland	287,770.65	.....	+ 287,770.65
Canadian share of expenses International Whaling Commission	308.00	.....	+ 308.00
Department of Finance—Fisheries	60,645.10	.....	+ 60,645.10
Appropriations not required in 1949–50	.....	40,695.99	− 40,695.99
SPECIAL EXPENDITURE			
To provide for the extension of educational work in co-operative producing and selling among fishermen	75,173.22	76,822.11	− 1,648.89
Administration Expenses—Fisheries Prices Support Act, 1944	104,030.93	100,148.65	+ 3,882.28
To provide for assistance in the construction of vessels of the dragger and/or long liner type, subject to such terms and conditions as may be approved by the Governor in Council	44,175.45	49,372.95	− 5,197.50
To provide for assistance in the construction of bait freezing and storage facilities, subject to the approval of the Governor in Council	35,106.00	4,000.00	+ 31,106.00
To provide for investigation into transportation and storage facilities in wholesale and retail handling of fish and fish products	534.83	.....	+ 534.83
Amount required to recoup the Fisheries Prices Support Account, to cover the net operating loss of the Fisheries Prices Support Board, during the fiscal year of 1948–49	538,988.35	.....	+ 538,988.35
To provide for assistance in meeting transportation costs on frozen herring purchases in British Columbia by persons, associations or companies, for bait in the 1948–49 winter fishery off Nova Scotia	24,919.42	29,250.00	− 4,330.58
Appropriation not required in 1949–50	.....	5,435.28	− 5,435.28
Grand Total	$7,586,370.16	$5,423,415.07	+$2,162,955.09

Open Accounts	Balance Close of 1948–49	Current Year		Balance Close of 1949–50
		Receipts	Disbursements	
CASH AND OTHER CURRENT ASSETS				
WORKING CAPITAL ADVANCES				
(A) Fisheries Prices Support Account.....	$1,173,421.46	$ 642,553.29	$ 340,737.78	$ 871,605.95
OTHER LOANS AND INVESTMENTS				
(B) Province of British Columbia.....	1,886.11	1,886.11	7.92	7.92
United States Government—				
(C) Pacific Halibut Treaty.....	19,496.89	13,942.77	27,116.45	32,670.57
(D) Pacific Salmon Treaty.....	68,872.32	68,841.77	113,522.00	113,552.55
(E) Pacific Salmon Treaty (Hell's Gate)...	100,655.24	102,714.78	49,006.79	46,947.25
	1,364.332.02	829.938.72	530,390.94	1,064,784.24
FLOATING DEBT—				
(F) Outstanding Imprest Account Cheques.....	(Cr.) 257.09	11.00	.75	(Cr.) 267.34
DEPOSIT AND TRUST ACCOUNTS—				
(G) Contractors' Security Deposits.....	(Cr.) 22,539.05	2,089.92	7,381.24	(Cr.) 17,247.73
(H) Atlantic Herring Investigation.....	(Cr.) 1,892.90	39,275.00	41,167.90	.....
INSURANCE, PENSION AND GUARANTY ACCOUNTS — PENSIONS AND RETIREMENT FUNDS—				
(J) Retirement Fund—Fisheries.....	(Cr.) 1,226.15	11,896.30	3,486.33	(Cr.) 9,636.12
SUNDRY SUSPENSE ACCOUNTS—				
(K) Suspense Account—Fisheries.....	(Cr.) 12,347.44	270,412.57	251,661.47	(Cr.) 31,098.54
(L) Unclaimed Drafts Suspense.....	(Cr.) 35.00	.....	35.00	.....
(M) Unclaimed Cheques Suspense.....	(Cr.) 2,826.40	102.60	8.30	(Cr.) 2,920.70
(N) Newfoundland Settlement— Fisheries.....	.....	16,248.31	3,920.21	(Cr.) 12,328.10
	$1,323,207.99	$1,169,974.42	$838,052.14	$991,285.71

NOTES:

A. P.C. 1229 of March 25, 1948, and P.C. 1/2255 of May 18, 1948, authorized the Fisheries Prices Support Board to purchase not more than 190,000 cases of East Coast canned fish for the purpose of assisting the fishing industry in post-war re-adjustment. Disposal was completed during 1949–50.
P.C. 1148 of March 10, 1949, and P.C. 2016 of April 26, 1949, authorized the Fisheries Prices Support Board to purchase not more than 5,000,000 pounds of fish, produced in the Prairie Provinces. Purchase and disposal were completed during the year.

B. Under agreement between the Fisheries Research Board of Canada and the Province of British Columbia, the province contributes certain sums to defray a portion of the expenses incurred by the Pacific Biological Station at Nanaimo, B.C., on herring and pilchard investigation. This arrangement ceased on March 31, 1950.

C. Under the Pacific Halibut Treaty, the United States Government pays one-half the expenses incurred by the International Fisheries Commission.

D. Under the Pacific Salmon Treaty, the United States Government pays one-half of the expenses incurred by the International Pacific Salmon Fisheries Commission.

E. Under the Pacific Salmon Treaty, the United States Government pays one-half of the expenses incurred by the International Pacific Salmon Fisheries Commission in connection with Hell's Gate Fishway.

F. The funds, covering Imprest Account cheques which remain uncashed after one year; are withdrawn from the Imprest Accounts and credited to this Account.

G. This account represents cash deposits received from contractors, such deposits to be returned upon satisfactory completion of the contracts concerned.

H. The Atlantic Herring Investigation Committee was set up in 1944 by the Governments of Canada, Newfoundland, Nova Scotia, Prince Edward Island, New Brunswick and Quebec, each contributing a pre-determined share of expenses. During 1949–50 the Governments of Canada, Newfoundland, New Brunswick and Quebec shared the expenses, Canada's share being $12,000, subject to a return of a portion of any amount remaining unexpended at the close of the fiscal year. The Committee's operations terminated on March 31, 1950.

J. Retirement Fund contributions from those employees not paid through Central Pay Office are credited to this account.

K. Receipts which cannot be allocated immediately are credited to this account pending clearance to the proper accounts.

L. Receiver General Drafts which cannot be allocated immediately are credited to this account pending clearance to the proper accounts.

M. All cheques which remain undelivered six months are credited to this account.

N. Payments of accounts, refunds and other credits, for periods prior to April 1, 1949, on account of Newfoundland, were debited or credited to this account as applicable. Final settlement with the Government of Newfoundland is to be made by the Department of Finance.

COMPARATIVE DETAILS OF EXPENDITURE, 1949-50

Description	Expenditure 1949–50	Expenditure 1948–49	Increase or Decrease
Departmental Administration—			
Salaries and Wages	$ 309,629.03	$ 246,535.38	+ $63,093.65
Telephones, Telegrams and Postage	9,639.07	.....	+ 9,639.07
Printing, Stationery and Office Equipment	15,299.82	14,162.17	+ 1,137.65
Travelling Expenses	22,819.16	14,879.93	+ 7,939.23
Sundries	4,188.17	13,037.19	— 8,849.02
	361,575.25	288,614.67	+ 72,960.58
Fisheries Inspection, including Fishery Officers and Guardians, Fisheries Patrol and Protection Service—			
Salaries and Wages	1,624,199.73	1,354,365.01	+ 269.834.72
Allowances (Living)	9,372.36	49,484.05	— 40,111.69
Telephones, Telegrams and Postage	43,767.89	.....	+ 43,767.89
Printing, Stationery and Office Equipment	27,895.02	42,291.85	— 14,396.83
Professional and Special Services	2,102.41	.....	+ 2,102.41
Freight, Express and Cartage	6,292.12	.....	+ 6,292.12
Travelling Expenses	287,264.63	244,347.51	+ 42,917.12
Materials and Supplies, Patrol and Protection Boats	190,610.37	288,578.59	— 97,968.22
Materials and Supplies	23,728.73	.....	+ 23,728.73
Repairs to Patrol and Protection Boats	95,540.09	106,005.95	— 10,465.86
Charter of Boats	62,501.89	.....	+ 62,501.89
Charter of Aircraft	49,193.94	.....	+ 49,193.94
Acquisition of Vessels and Vessel Equipment	264,786.49	116,358.89	+ 148,427.60
Acquisition of Equipment	56,872.18	.....	+ 56,872.18
Repairs and Upkeep, Buildings, Works and Structures	2,653.85	.....	+ 2,653.85
Repair and Upkeep of Equipment	4,777.88	.....	+ 4,777.88
Rental	4,817.47	.....	+ 4,817.47
Acquisition or Construction of Buildings, Works and Structures, including Acquisition of Land	24,729.24	180.95	+ 24,548.29
Sundries	21,824.66	74,828.02	— 53,003.36
	2,802,930.95	2,276,440.82	+ 526,490.13
Educational Extension Service—			
Salaries and Wages	5,602.50	7,453.39	— 1,850.89
Printing, Stationery and Office Equipment	28,266.35	24,941.24	+ 3,325.11
Travelling Expenses	4,181.58	7,599.30	— 3,417.72
Advertising and Publicity	15,000.00	38,935.68	— 23,935.68
Supplies and Materials	17,417.98	46,106.88	— 28,688.90
Grant to Lunenburg Fisheries Exhibition	3,000.00	3,000.00	.....
Sundries	4,797.75	1,766.46	+ 3,031.29
	78,266.16	129,802.95	— 51,536.79
Fish Culture Development—			
Salaries and Wages	202,560.09	155,479.68	+ 47,080.41
Telephones, Telegrams and Postage	1,987.89	.....	+ 1,987.89
Printing, Stationery and Office Equipment	2,976.36	947.77	+ 2,028.59
Freight, Express and Cartage	1,118.70	.....	+ 1,118.70
Travelling Expenses	28,767.60	11,772.17	+ 16,995.43
Materials and Supplies	83,369.87	77,835.63	+ 5,534.24
Acquisition or Construction, Buildings Works and Structures	93,511.51	37,436.66	+ 56,074.85
Acquisition of Equipment	60,047.53	.....	+ 60,047.53
Repairs and Upkeep, Buildings, Works and Structures	59,647.24	33,357.30	+ 26,289.94
Repair and Upkeep of Equipment	5,227.20	.....	+ 5,227.20
Sundries	9,537.48	13,760.28	— 4,222.80
	548,751.47	330,589.49	+ 218,161.98

Description	Expenditure 1949–50	Expenditure 1948–49	Increase or Decrease
Oyster and Clam Culture—			
Salaries and Wages	$39,196.51	$29,843.54	+ $9,352.97
Printing, Stationery and Office Equipment	433.18	.....	+ 433.18
Travelling Expenses	7,176.98	6,823.79	+ 353.19
Supplies and Materials	8,021.51	.....	+ 8,021.51
Sundries	1,828.91	9,208.63	— 7,379.72
	56,657.09	45,875.96	+ 10,781.13
Fisheries Research Board of Canada—			
Operation and Maintenance—			
Salaries and Wages	752,756.44	592,764.28	+ 159,992.16
Printing, Stationery and Office Equipment	31,101.56	18,979.23	+ 12,122.33
Travelling Expenses	95,660.18	79,344.91	+ 16,315.27
Materials and Supplies	68,630.85	94,112.79	— 25,481.94
Acquisition of Equipment	119,707.61	43,914.98	+ 75,792.63
Laboratory Maintenance and Operation	63,267.87	33,726.34	+ 29,541.53
Vessel Maintenance and Operation	83,761.56	24,590.03	+ 59,171.53
Special Field Researches	620.05	12,152.56	— 11,532.51
Contribution to Atlantic Herring Investigation Committee	12,000.00	12,000.00	.....
Miscellaneous	50,877.30	42,632.19	+ 8,245.11
	1,278,383.42	954,217.31	+ 324,166.11
International Fisheries Commission (Halibut)—			
Salaries and Wages	27,285.56	19,311.30	+ 7,974.26
Printing, Stationery and Office Equipment	917.03	617.20	+ 299.83
Travelling Expenses	2,493.22	2,792.68	— 299.46
Sundries	4,049.74	3,417.41	+ 632.33
	34,745.55	26,138.59	+ 8,606.96
International Pacific Salmon Fisheries Commission—			
Salaries and Wages	72,120.06	61,799.21	+ 10,320.85
Printing, Stationery and Office Equipment	1,187.87	2,088.27	— 900.40
Travelling Expenses	6,532.07	6,927.14	— 395.07
Sundries	45,094.45	27,435.58	+ 17,658.87
	124,934.45	98,250.20	+ 26,684.25
Administrative Expenses, Newfoundland Fisheries Board—			
Salaries and Wages	209,663.62	.....	+ 209,663.62
Allowances	4,137.91	.....	+ 4,137.91
Telephones, Telegrams and Postage	5,463.04	.....	+ 5,463.04
Printing, Stationery and Office Equipment	4,569.14	.....	+ 4,569.14
Freight, Express and Cartage	286.09	.....	+ 286.09
Travelling Expenses	44,922.34	.....	+ 44,922.34
Vessel Maintenance and Operation	11,948.69	.....	+ 11,948.69
Acquisition of Equipment	7,209.59	.....	+ 7,209.59
Sundries	1,881.54	.....	+ 1,881.54
	290,081.96	.....	+ 290,081.96
Maintenance and Extension of Bait Service—			
Salaries and Wages	110,879.18	.....	+ 110,879.18
Telephones, Telegrams and Postage	820.77	.....	+ 820.77
Printing, Stationery and Office Equipment	862.70	.....	+ 862.70
Freight, Express and Cartage	1,198.33	.....	+ 1,198.33
Travelling Expenses	3,904.74	.....	+ 3,904.74
Charter of Boats	5,715.00	.....	+ 5,715.00
Acquisition or Construction of Buildings, Works and Structures including Acquisition of Land	31,452.31	.....	+ 31,452.31
Maintenance of Bait Depots	38,650.78	.....	+ 38,650.78
Purchase of Bait Supplies	58,492.56	.....	+ 58,492.56
Vessel Maintenance and Operation	31,197.95	.....	+ 31,197.95
Sundries	4,596.33	.....	+ 4,596.33
	287,770.65	.....	+ 287,770.65
Administration Expenses, Fisheries Prices Support Board—			
Salaries and Wages	75,108.02	63,191.03	+ 11,916.99
Allowances	2,730.00	5,592.50	— 2,862.50
Printing, Stationery and Office Equipment	2,046.97	3,254.00	— 1,207.03
Travelling Expenses	22,474.63	26,225.46	— 3,750.83
Sundries	1,671.31	1,885.66	— 214.35
	$104,030.93	$100,148.65	+ $3,882.28

FISHERIES INSPECTION

INCLUDING FISHERY OFFICERS AND GUARDIANS, FISHERIES PATROL AND PROTECTION SERVICES

DISTRIBUTION OF EXPENDITURE BY DIVISION AND ESTABLISHMENT

Newfoundland

—	Inspectors Permanent Salaries	Guardians		Patrol Service Other Expenditure	General		Total
		Permanent Salaries	Temporary Assistance		Permanent Salaries	Other Expenditure	
Inspection and Protection	$37,663.15	$5,640.00	$26,759.40	.....	.....	.....	$70,062.55
Cinderella	.....	.....	.....	$ 975.00	.....	.....	975.00
Louise Ruth	.....	.....	.....	975.00	.....	.....	975.00
Eastern Explorer	.....	.....	.....	33,943.76	.....	.....	33,943.76
Point May	.....	.....	.....	6,892.39	.....	.....	6,892.39
Division Fisheries Office	.....	.....	.....	.....	.....	$1,892.89	1,892.89
Fish Inspection Laboratory	.....	.....	.....	.....	$7,020.00	330.00	7,350.00
Miscellaneous	.....	.....	.....	.....	.....	23,023.84	23,023.84
	$37,663.15	$5,640.00	$26,759.40	$42,786.15	$7,020.00	$25,246.73	$145,115.43

East—Administration

	Inspectors			Guardians		Miscellaneous Administrative Expenses	General			Totals
	Permanent Salaries	Temporary Assistance	Other Expenditure	Temporary Assistance	Other Expenditure		Permanent Salaries	Temporary Assistance	Other Expenditure	
Nova Scotia—										
Inverness-Victoria	$10,890.00	$15,823.55	$12,365.82	$19,059.06	$ 768.90	$ 209.10				$59,116.43
Richmond-Cape Breton	10,350.00	12,087.07	8,586.11	2,169.00	358.88	145.18				33,697.14
Cumberland-Colchester-Hants	13,470.00	13,860.00	11,288.97	8,945.61	1,265.61	2,024.60				50,854.79
Pictou-Antigonish-Guysborough	8,310.00	17,042.26	8,931.96	6,584.52	388.65	209.68				41,467.07
Halifax	10,344.52	19,591.67	9,608.57	5,696.34	1,127.21	226.30				46,594.61
Lunenburg-Queens	5,722.32	22,590.77	12,534.94	19,610.20	939.46	165.29				61,562.98
Shelburne-Yarmouth	2,800.32	17,483.00	8,911.71	5,260.80	41.34	195.90				34,693.07
Digby-Annapolis-Kings	10,350.00	12,793.00	10,941.44	6,609.39	19.88	196.62				40,910.33
Regional Office							$11,845.00	$10,226.83	$9,138.07	31,209.90
Prince Edward Island—										
Prince	8,310.00	14,493.29	10,202.59	8,458.71	103.55	549.03				42,117.17
Queens	5,730.00	10,548.00	5,064.64	1,428.80	599.70	183.46				23,554.60
Kings	3,150.00	12,720.00	7,728.91	600.00	343.48	201.75				24,744.14
Regional Office							9,090.00	2,082.77	3,187.97	14,360.74
New Brunswick—										
Restigouche-Gloucester	8,310.00	25,105.00	12,345.11	3,901.53	256.67	406.25				50,324.56
Northumberland	11,220.00	15,735.00	13,685.76	20,029.75	909.88	715.66				62,296.05
Kent-Albert-Westmoreland	5,730.00	20,995.83	11,279.20	11,036.97	2,227.73	675.61				52,945.34
St. John-Charlotte	10,890.00	15,862.46	8,591.72	7,374.33	116.99	367.56				43,203.06
Kings-Queens-Sunbury-York Carleton-Victoria-Madawaska	8,290.00	14,456.00	9,313.27	25,757.91	841.39	525.39				59,183.96
Regional Office							6,920.00	13,595.29	11,459.34	31,974.63
East—										
Fish Inspection Laboratory							2,866.67	54,242.64	35,570.51	92,679.82
Division Fisheries Office							31,752.50	19,422.02	28,631.70	79,806.22
Miscellaneous									11,028.77	11,028.77
Quebec—										
General								1,260.00	1,681.91	2,941.91
	$133,867.16	$261,187.80	$161,380.72	$153,522.92	$10,309.32	$6,997.38	$62,474.17	$100,829.55	$100,698.27	$991,267.29

East—Patrol Service

——	Permanent Salaries	Temporary Assistance	Other Expenditure	Total
NOVA SCOTIA—				
A. Halkett	$ 2,552.00	$ 7,494.97	$ 2,993.09	$13,040.06
Capelin	1,856.00	3,819.90	1,288.75	6,964.65
Gilbert	2,430.00	3,675.00	1,799.91	7,904.91
Venning	354.00	5,567.91	2,282.41	8,204.32
Mya	.....	2,516.68	2,064.63	4,581.31
Modiolus	.....	3,452.51	4,392.73	7,845.24
Limanda	928.00	2,464.80	57,073.66	60,466.46
Lacuna	.....	911.42	55,394.25	56,305.67
Chartered Boats	.....	2,900.07	3,895.25	6,795.32
Miscellaneous	.....	.....	57.63	57.63
PRINCE EDWARD ISLAND—				
Capitol	.....	934.74	805.56	1,740.30
Menidia	.....	1,406.96	619.44	2,026.40
Macoma	.....	2,377.57	3,248.38	5,625.95
Capital II	.....	2,940.50	3,639.86	6,580.36
Chartered Boats	.....	7,429.69	4,795.88	12,225.57
Miscellaneous	.....	.....	130.58	130.58
NEW BRUNSWICK—				
Gannet Rock II	4,438.00	232.00	1,390.21	6,060.21
Alosa	5,160.00	3,586.00	8,050.79	16,796.79
Osmerus	.....	4,845.78	2,335.44	7,181.22
Pecten	.....	1,934.54	2,813.48	4,748.02
Crago	.....	2,379.84	3,256.32	5,636.16
Annette Allard	.....	1,933.63	7,781.61	9,715.24
Chartered Boats	.....	4,735.95	8,657.36	13,393.31
Miscellaneous	.....	.....	220.25	220.25
EAST—GENERAL	.....	.....	2,034.50	2,034.50
AIR PATROL—				
Prince Edward Island	.....	.....	666.00	666.00
New Brunswick	.....	.....	96.33	96.33
East—General	.....	.....	1,341.00	1,341.00
	$17,718.00	$67,540.46	$183,125.30	$268,383.76

East—Protection Service

——	Permanent Salaries	Temporary Assistance	Other Expenditure	Total
Cygnus	$6,340.00	$52,282.42	$62,202.33	$120,824.75

Central Fisheries

—	Inspectors			Guardians		Miscellaneous Administrative Expenses	General			Totals
	Permanent Salaries	Temporary Assistance	Other Expenditure	Temporary Assistance	Other Expenditure		Permanent Salaries	Temporary Assistance	Other Expenditure	
Ontario		$11,334.10	$2,815.16			$4,200.12				$18,349.38
Manitoba		12,514.33	3,285.91	$2,267.20	$548.84	319.89				18,936.17
Saskatchewan		1,260.00	386.20			18.91				1,665.11
Alberta		2,711.29	719.96			146.02				3,577.27
Northwest Territories		2,238.50	2,173.43	6,994.18	1,847.49	30,341.60				43,595.20
Division Fisheries Office							4,615.00	$22,665.97	$31,318.71	58,599.68
Miscellaneous									12,061.33	12,061.33
Patrol Boat "Daphnia"									8,722.03	8,722.03
Totals		$30,058.22	$9,380.66	$9,261.38	$2,396.33	$35,026.54	$4,615.00	$22,665.97	$52,102.07	$165,506.17

West Administration

—	Inspectors			Guardians		Miscellaneous Administrative Expenses	General			Totals
	Permanent Salaries	Temporary Assistance	Other Expenditure	Temporary Assistance	Other Expenditure		Permanent Salaries	Temporary Assistance	Other Expenditure	
British Columbia—										
District No. 1	$14,818.33	$25,865.99	$18,392.35	$9,121.16	$5,244.84	$ 588.54				$74,031.21
District No. 2	12,880.00	49,822.18	25,044.45	17,489.31	2,852.52	1,669.17				109,757.63
District No. 3	18,560.00	47,760.22	19,319.73	7,297.77	1,060.37	2,907.44				96,905.53
Division Fisheries Office							$17,141.68	$24,813.09	$14,214.93	56,169.70
Fish Inspection Laboratory							7,965.00	5,829.58	9,318.47	23,113.05
Miscellaneous									8,673.09	8,673.09
Yukon									2.99	2.99
Totals	$46,258.33	$123,448.39	$62,756.53	$33,908.24	$9,157.73	$5,165.15	$25,106.68	$30,642.67	$32,209.48	$368,653.20

West—Patrol Service	Permanent Salaries	Temporary Assistance	Other Expenditure	Totals
District No. 1—				
F.D. 101	$ 5,190.00	$ 1,770.00	$ 3,211.25	$10,171.25
F.D. 102	.....	3,252.22	1,257.55	4,509.77
Nelson Post	.....	.....	233.08	233.08
Swantail II	4,648.39	1,706.33	1,150.07	7,504.79
Vedder River	2,805.00	3,615.16	1,730.78	8,150.94
Miscellaneous	.....	.....	7,861.88	7,861.88
District No. 2—				
Babine I	.....	639.00	93.59	732.59
Babine II	.....	286.00	478.66	764.66
Beldis	.....	2,964.25	2,679.24	5,643.49
Bonila Rock II	4,488.35	1,545.67	1,812.13	7,846.15
Clupea	586.00	3,755.72	2,431.15	6,772.87
F.D. 201	.....	2,285.40	1,285.47	3,570.87
F.D. 202	.....	1,856.40	1,040.22	2,896.62
Onerka II	.....	4,016.05	4,904.46	8,920.51
Minktrap Bay	.....	357.66	113.84	471.50
Skeena	.....	.....	402.58	402.58
Agonus	.....	5,211.93	2,194.62	7,406.55
Snipe (R.C.A.F.)	.....	1,296.00	2,728.34	4,024.34
Barmar	.....	2,453.30	24,180.68	26,633.98
Chartered Boats	.....	34,239.51	37,499.59	71,739.10
Miscellaneous	.....	.....	9,381.37	9,381.37
District No. 3—				
Black Raven II	.....	6,543.05	2,729.14	9,272.19
Egret Plume II	.....	6,714.16	2,145.55	8,859.71
Pholus	.....	2,805.00	1,222.11	4,027.11
Diaphus	.....	2,805.00	2,237.86	5,042.86
Pursepa	.....	6,594.74	3,542.06	10,136.80
Gray Goose (R.C.A.F.)	.....	2,206.74	2,474.56	4,681.30
Chartered Boats	.....	37,334.83	39,154.80	76,489.63
General	.....	.....	85.41	85.41
Air Services—				
District No. 1	.....	.....	610.11	610.11
District No. 2	.....	.....	23,980.00	23,980.00
District No. 3	.....	.....	22,500.50	22,500.50
Fisheries Stations—				
Prince Rupert	3,274.45	4,510.80	4,945.59	12,730.84
New Westminster	3,600.00	24,679.05	4,672.14	32,951.19
Totals	$24,592.19	$165,443.97	$216,970.38	$407,006.54

West—Protection Service	Permanent Salaries	Temporary Assistance	Other Expenditure	Total
District No. 1				
Chilco Post	$ 5,370.00	$ 6,145.26	$ 6,954.05	$ 18,469.31
District No. 2				
Arrow Post	.....	9,429.68	7,798.33	17,228.01
Babine Post	2,456.68	6,839.45	8,026.13	17,322.26
Nicola Post	.....	11,491.91	9,791.33	21,283.24
Sooke Post	.....	8,267.73	25,777.69	34,045.42
District No. 3—				
Atlin Post	.....	11,540.00	8,737.61	20,277.61
Comox Post	2,375.00	7,094.81	8,896.23	18,366.04
Stuart Post	2,611.00	6,575.47	8,590.54	17,777.01
General—				
Howay	12,231.61	21,555.54	28,906.52	62,693.67
Kitimat	9,319.30	13,997.25	25,029.03	48,345.58
Laurier	6,951.60	26,494.63	26,343.43	59,789.66
Miscellaneous	.....	.....	576.00	576.00
Totals	$41,315.19	$129,431.73	$165,426.89	$336,173.81

Summary

—	Newfoundland	Nova Scotia	Prince Edward Island	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon	Northwest Territories	Totals
	$	$	$	$	$	$	$	$	$	$	$	$	$
Inspection Service	145,115.43												145,115.43
East—Administration		490,955.23	128,624.29	368,064.29	3,623.28								991,267.29
East—Patrol Service		174,356.46	29,364.55	64,662.75									268,383.76
East—Protection Service		40,274.92	40,274.91	40,274.92									120,824.75
Central Fisheries						31,737.78	33,068.37	3,152.71	6,552.47			90,994.84	165,506.17
West—Administration										368,650.21	2.99		368,653.20
West—Patrol Service										407,006.54			407,006.54
West—Protection Service										336,173.81			336,173.81
	145,115.43	705,586.61	198,263.95	473,001.96	3,623.28	31,737.78	33,068.37	3,152.71	6,552.47	1,111,830.56	2.99	90,994.84	2,802,930.95

FISHERIES RESEARCH BOARD OF CANADA
(Operation and Maintenance)

Expenditure, 1949-50

—	From Vote	From Receipts	Total
Newfoundland Biological Station, St. John's, Nfld.	$ 72,682.69	.....	$ 72,682.69
Atlantic Experimental Station, Halifax, N.S.	161,792.07	$ 2,600.00	164,392.07
Atlantic Biological Station, Ellerslie, P.E.I.	12,010.89	.....	12,010.89
Atlantic Biological Station, St. Andrews, N.B.	261,736.81	700.00	262,436.81
Atlantic Herring Investigation	12,000.00	.....	12,000.00
Atlantic Oceanographic Group	16,506.83	.....	16,506.83
Gaspe Experimental Station, Grand River, Quebec	73,064.61	.....	73,064.61
Central Fisheries Research Station, Winnipeg, Man.	44,922.64	200.00	45,122.64
Pacific Oceanographic Group	30,114.21	.....	30,114.21
Pacific Biological Station, Nanaimo, B.C.	260,381.75	1,200.00	261,581.75
Pacific Experimental Station, Vancouver, B.C.	108,339.19	375.00	108,714.19
Northwest Territories Investigation	5,014.43	.....	5,014.43
Toronto Office—A. G. Huntsman	10,972.44	3,211.63	14,184.07
Publications	11,833.56	.....	11,833.56
Atlantic Salmon Investigation	3,520.51	.....	3,520.51
Marine Survey—Eastern Arctic	9,345.39	.....	9,345.39
Vessels:			
Investigator II (Newfoundland)	82,078.99	.....	82,078.99
J. J. Cowie (N.B.)	14,748.03	.....	14,748.03
Pandalus (N.B.)	6,386.57	.....	6,386.57
Mactra, S. (N.B.)	3,213.56	.....	3,213.56
Investigator (B.C.)	30,184.69	.....	30,184.69
Calanus (Eastern Arctic)	7,504.02	.....	7,504.02
Administration—General	40,029.54	.....	40,029.54
Totals	$1,278,383.42	$8,286.63	$1,286,670.00

FISH CULTURE DEVELOPMENT

Expenditure by Division and Establishment

NOVA SCOTIA—		
Antigonish Hatchery	$27,043.26	
Bedford Hatchery	12,382.41	
Cobequid Hatchery	30,058.16	
Coldbrook Rearing Station	11,204.19	
Kijimkujik Rearing Station	11,955.78	
Lindloff Hatchery	26,747.56	
Margaree Hatchery	19,839.18	
Margaree Retaining Ponds	4,309.52	
Middleton Hatchery	16,028.20	
Nictaux Rearing Station	32.00	
River Philip Retaining Pond	20,546.95	
Sackville Retaining Pond	334.35	
Yarmouth Hatchery	12,039.09	
Grand Lake Rearing Station	11,041.52	
Mersey River Rearing Station	7,246.90	
General	6,326.23	
		$217,135.30
PRINCE EDWARD ISLAND—		
Southport Hatchery	5,687.34	
Morrell Retaining Pond	841.42	
Cardigan Retaining Ponds	7,077.08	
General	563.72	
		14,169.56

New Brunswick—		
Florenceville Hatchery	18,887.63	
Grand Falls Hatchery	13,477.64	
Miramichi Hatchery	22,602.45	
Mirimachi Retaining Pond	3,461.35	
New Mills Retaining Pond	7,776.51	
Saint John Hatchery	29,162.16	
Charlo Hatchery	19,111.35	
Haley Brook Rearing Pond	29,411.72	
Various Works and Fishways	6,602.83	
General	3,121.48	
		153,615.12
East—General		80,266.60
British Columbia		
West—General		$ 72,345.35
—Prince Rupert Region		8,192.72
—Nanaimo Region		2,947.82
General		79.00
		$548,751.47

BAIT SERVICE (NEWFOUNDLAND)

Expenditure by Establishment

——	Permanent Salaries	Temporary Assistance	Purchase of Bait	Construction of Buildings	Other Expenditure	Total
	$	$	$	$	$	$
Port-aux-Basques	3,840.00	500.67	1,151.41	.....	1,796.15	7,288.23
Rose Blanche	3,600.00	1,166.87	35.02	.....	3,621.84	8,423.73
Rencontre West	3,600.00	641.40	568.09	.....	1,709.51	6,519.00
Hermitage	3,600.00	764.45	6,128.11	.....	1,940.75	12,433.31
Rencontre East	5,880.00	4,013.22	17,365.79	.....	9,313.35	36,572.36
Grand Bank	1,305.00	1,332.97	413.32	20,096.47	4,467.57	27,615.33
Lamaline	1,500.00	2.40	.....	.....	240.60	1,743.00
Oderin	1,500.00	67.80	.....	.....	719.18	2,286.98
Merasheen	1,500.00	34.75	.....	.....	528.92	2,063.67
Long Harbour	1,860.00	792.30	4,296.85	.....	1,690.36	8,639.51
St. Mary's	1,740.00	629.38	2,492.26	.....	1,021.06	5,882.70
Ferryland	1,860.00	1,425.90	3,319.27	.....	1,937.36	8,542.53
Bonavista	1,860.00	2,278.89	3,226.91	.....	4,131.53	11,497.33
Greenspond	1,740.00	170.80	1,013.48	.....	1,465.82	4,390.10
Joe Batts Arm	1,740.00	308.00	928.22	.....	486.38	3,462.70
Change Islands	.....	1,342.28	274.57	11,355.84	1,262.35	14,235.04
Twillingate	1,740.00	787.75	1,873.25	.....	1,680.86	6,081.86
Nippers Harbour	1,740.00	333.20	548.40	.....	1,096.19	3,717.79
Conche	1,740.00	199.05	642.80	.....	1,015.54	3,597.39
Quirpon	1,524.84	440.49	359.93	.....	344.01	2,669.27
St. John's Spare Parts Depot	.....	32.80	.....	.....	909.74	942.54
"Malakoff"	2,820.00	23,199.08	7,028.68	.....	29,047.01	62,094.77
"Eastern Explorer"	.....	5,452.79	6,855.95	.....	4,955.02	17,263.76
"Kathleen & Jack"	.....	.....	.....	.....	5,715.00	5,715.00
General Account	15,630.00	2,642.00	(Cr.) 29.75	.....	5,850.50	24,092.75
Totals	62,319.84	48,559.34	58,492.56	31,452.31	86,946.60	287,770.65

DIVISIBLE EXPENDITURES AND RECEIPTS, 1949-50

—	Gross Expenditure	Canada's Share	United States' Share	Receipts from United States	Balance due from United States
	$	$	$	$	$
Pacific Halibut Treaty	68,613.08	34,745.55	33,867.53	6,751.08	27,116.45
Pacific Salmon Treaty	249,327.14	124,934.45	124,392.69	10,870.69	113,522.00
Pacific Salmon Treaty (Hell's Gate)	116,050.63	57,874.10	58,176.53	9,169.74	49,006.79
Total	433,990.85	217,554.10	216,436.75	26,791.51	189,645.24

NOTE 1: Canada's share of expenses of Pacific Halibut Treaty and Pacific Salmon Treaty is higher than the United States' share by reason of non-divisible expenses.

NOTE 2: United States' share of expenses of Pacific Salmon Treaty (Hell's Gate) is higher than Canada's share by reason of (*a*) Workmen's Compensation, Canada's share having been paid by the Department of Labour and (*b*) Employer's portion of Unemployment Insurance, Canada's share having been paid by the Department of Finance.

PRIBILOF SEALING

Statement of Revenue and Expenditure, 1949-50

RECEIPTS FROM SALES:	
April—1,625 skins	$ 89,529.65
June—3,339 skins	170,194.00
October—4,548 skins	235,930.43
December—3,086 skins	182,172.50
March—2,246 skins	158,090.00
Total Receipts	$835,916.58
EXPENDITURES:	
Dressing and Dyeing	$249,628.40
Cases and Packing	220.50
Blubbering	3,214.99
Freight	9,880.08
Customs Duties and Sales Tax	198,022.86
Customs Brokerage	378.25
Commissions on Sales	22,891.02
Travelling Expenses	496.42
	$484,732.52

Disposal of Seal Skins, 1949-50

Skins on hand on March 31, 1949				16,094
Sales during 1949-50			14,844	
Spoiled skins (see note)			8	
Canada's share of 1949 catch				14,198
On hand March 31, 1950:				
C. W. Martin & Sons	—1948 catch	10		
	—1949 catch	3,563		
Fouke Fur Co.	—1948 catch	1,244		
	—1949 catch	9,216		
Martin-Schnaufer Toronto	—1949 catch	1,399		
F. A. C. Harrison, Dept. of Fisheries	—1947 catch	4		
	—1948 catch	1		
Miss Rhona Shaw, Montreal	—1948 catch	3		
			15,440	
			30,292	30,292

NOTE: Recovery of $336.72 for eight spoiled skins made from C. W. Martin and Sons by deduction from account.

1949 FISHING BOUNTY STATEMENT

Province and County	Boats	Men	Amount	Vessels	Tons	Average Tons	Men	Amount	Total Amount
NOVA SCOTIA—									
Annapolis	156	228	$ 2,037.00	5	60	12	10	$ 142.50	$ 2,179.50
Antigonish	76	107	958.75						958.75
Cape Breton	191	303	2,690.75	81	1,112	14	261	3,265.25	5,956.00
Cumberland	6	7	63.75						63.75
Digby	246	417	3,686.25	57	670	11	122	1,676.50	5,362.75
Guysboro	361	525	4,692.25	54	726	13	141	1,889.25	6,581.50
Halifax	713	965	8,674.25	35	608	17	145	1,804.25	10,478.50
Inverness	100	193	1,692.25	32	394	12	132	1,483.00	3,175.25
Kings	51	72	645.00						645.00
Lunenburg	566	661	6,019.25	47	2,168	46	768	8,504.00	14,523.25
Pictou	7	9	81.25						81.25
Queens	137	207	1,844.75	28	410	15	67	962.75	2,807.50
Richmond	264	486	4,273.50	30	387	12	89	1,121.25	5,394.75
Shelburne	457	748	6,628.00	196	2,822	14	618	7,920.50	14,548.50
Victoria	141	210	1,873.50	16	198	12	50	610.50	2,484.00
Yarmouth	141	304	2,649.00	71	976	14	246	3,005.50	5,654.50
Total	3,613	5,442	$48,509.50	652	10,531	192	2,649	$32,385.25	$80,894.75
PRINCE EDWARD ISLAND—									
Kings	190	250	2,252.50						2,252.50
Prince	401	677	5,986.25						5,986.25
Queens	121	227	1,993.75						1,993.75
	712	1,154	10,232.50						$10,232.50

1949 FISHING BOUNTY STATEMENT

Province and County	Boats	Men	Amount	Vessels	Tons	Average Tons	Men	Amount	Total Amount
NEW BRUNSWICK—									
Charlotte	126	213	$ 1,883.25	44	628	14	149	$ 1,857.25	$ 3,740.50
Gloucester	450	843	7,404.75	99	2,035	20	409	5,409.25	12,814.00
Kent	176	290	2,568.50	23	403	17	50	715.50	3,284.00
Northumberland	25	55	478.75	28	326	11	58	807.50	1,286.25
Restigouche	11	19	167.75	.....	.....	.....	.....	.....	167.75
St. John	9	16	141.00	.....	.....	.....	.....	.....	141.00
Westmorland	38	74	648.50	.....	.....	.....	.....	.....	648.50
Total	835	1,510	13,292.50	194	3,392	62	666	$8,789.50	$22,082.00
QUEBEC—									
Bonaventure	217	430	$ 3,764.60	30	405	14	120	$ 1,395.00	$ 5,159.60
Gaspe	1,076	1,722	15,282.50	106	1,496	14	421	4,969.25	20,251.75
Magdalen Islands	585	1,443	12,489.75	2	39	19	8	105.00	12,594.75
Matane	32	42	378.50	.....	.....	.....	.....	.....	378.50
Saguenay	560	856	7,622.00	.....	.....	.....	.....	.....	7,622.00
Total	2,470	4,493	39,537.35	138	1,940	47	549	6,469.25	46,006.60
Grand Totals	7,630	12,599	$111,571.85	984	15,863	301	3,864	$47,644.00	$159,215.85

NOTE 1: Two 1948-49 Boat Claims were paid out of 1949-50 funds. These have been included in Bonaventure County (1 Boat at $1.00 and 2 boat Fishermen at $8.30 each).

NOTE 2: The basis of distribution for 1949 was as follows:

1. To owners of Vessels entitled to receive Bounty, One Dollar per registered ton, payment to the Owner of any one vessel not to exceed Eighty Dollars.
2. To Vessel Fishermen entitled to receive Bounty, Eight Dollars and Twenty-five cents each.
3. To Owners of boat measuring not less than twelve foot keel, One Dollar per boat.
4. To Boat Fishermen entitled to receive Bounty, Eight Dollars and Twenty-five cents each.

ANNUAL EXPENDITURE OF THE FEDERAL GOVERNMENT ON ACCOUNT OF FISHERIES SERVICE SINCE CONFEDERATION

Year	Fish Inspection, etc.	Fish Culture	Fisheries Research Board	Development of Deep Sea Fisheries, etc.	Fishing Bounty	Fisheries Prices Support Board	Sundry Services	Total
To 1948–49	$44,622,995.77	$13,119,651.15	$8,176,184.84	$2,693,952.05	$10,624,182.57	$134,485.19	$80,287,898.06	$159,659,349.63
1949–50	3,093,012.91	548,751.47	1,382,094.48	78,266.16	159,215.85	643,019.28	1,682,010.01	7,586,370.16
Total	$47,716,008.68	$13,668,402.62	$9,558,279.32	$2,772,218.21	$10,783,398.42	$777,504.47	$81,969,908.07	$167,245,719.79

EXPENDITURE OF FEDERAL GOVERNMENT ON ACCOUNT OF FISHERIES SINCE CONFEDERATION

Summary by Provinces

General	$11,947,985.78
Newfoundland	940,180.96
Nova Scotia	31,249,907.41
Prince Edward Island	5,045,950.54
New Brunswick	15,915,796.13
Quebec	9,394,871.73
Ontario	4,258,824.15
Manitoba	2,121,352.34
Manitoba and Northwest Territories	24,771.76
Saskatchewan	585,339.65
Alberta	649,405.22
British Columbia	84,731,920.74
Northwest Territories	346,735.80
Yukon Territory	32,677.58
Total	$167,245,719.79

——	General	Newfoundland	Nova Scotia	Prince Edward Island	New Brunswick
	$	$	$	$	$
Departmental Administration	361,575.25				
Minister's Salary and Motor Car Allowance	12,000.00				
Statutory—Civil Service (Death) Gratuities	940.00				
Fisheries Inspection, etc		145,115.43	705,586.61	198,263.95	473,001.96
Educational Extension Service	59,571.71	1,260.53	3,543.85		
Fish Culture Development	79.00		262,376.47	17,088.35	185,721.76
Oyster and Clam Culture	107.30		11,612.57	36,370.69	8,566.53
Fisheries Research Board of Canada—					
Operation and Maintenance	74,835.54	154,761.68	161,792.07	12,010.89	306,112.31
Construction and Improvements			2,530.00		
International Fisheries Commission (Halibut)					
International Pacific Salmon Fisheries Commission					
International Pacific Salmon Fisheries Commission (Hell's Gate)					
Processing Fur Seal Skins	484,732.52				
Destruction of Harbour Seals			4,725.00	750.00	1,665.00
Fishing Bounty			80,894.75	10,232.50	22,082.00
Administration Expenses—Newfoundland Fisheries Board		290,081.96			
Bait Service		287,770.65			
International Whaling Commission	308.00				
Extension of Educational Work in Co-operative Producing and Selling among Fishermen			44,704.78		
Administrative Expenses—Fisheries Prices Support Board	81,069.52	545.61	3,796.55		3,165.00
Assistance in Construction of Vessels of Dragger and/or Long Liner Type					44,175.45
Assistance in Construction of Bait Freezing and Storage Facilities			6,000.00	29,106.00	
To provide for investigation into transportation and storage facilities in wholesale and retail handling of fish	534.83				
Support Account for operating loss during 1948–49	538,988.35				
Assistance in meeting transportation costs of frozen British Columbia Herring	24,919.42				
Department of Finance—Fisheries		60,645.10			
	1,639,661.44	940,180.96	1,287,562.65	303,822.38	1,044,490.01

PROVINCES, 1949-50

Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Yukon Territory	Northwest Territory	Total
$	$	$	$	$	$	$	$	$
.....	.....	.....	.....	.....	.....	.....	.....	361,575.25
.....	.....	.....	.....	.....	.....	.....	.....	12,000.00
.....	.....	.....	.....	.....	.....	.....	.....	940.00
3,623.28	31,737.78	33,068.37	3,152.71	6,552.47	1,111,830.56	2.99	90,994.84	2,802,930.95
.....	6,206.12	.....	.....	.....	7,683.95	.....	.....	78,266.16
.....	.....	.....	.....	.....	83,485.89	.....	.....	548,751.47
.....	.....	.....	.....	.....	.....	.....	.....	56,657.09
73,064.61	.....	44,922.64	.....	.....	429,019.84	.....	21,863.84	1,278,383.42
.....	.....	.....	.....	.....	101,181.06	.....	.....	103,711.06
.....	.....	.....	.....	.....	34,745.55	.....	.....	34,745.55
.....	.....	.....	.....	.....	124,934.45	.....	.....	124,934.45
.....	.....	.....	.....	.....	57,874.10	.....	.....	57,874.10
.....	.....	.....	.....	.....	.....	.....	.....	484,732.52
.....	.....	.....	.....	.....	12,778.38	.....	.....	19,918.38
46,006.60	.....	.....	.....	.....	.....	.....	.....	159,215.85
.....	.....	.....	.....	.....	.....	.....	.....	290,081.96
.....	.....	.....	.....	.....	.....	.....	.....	287,770.65
.....	.....	.....	.....	.....	.....	.....	.....	308.00
24,000.00	.....	.....	.....	.....	6,468.44	.....	.....	75,173.22
1,726.54	29.50	2,252.08	.....	.....	11,446.13	.....	.....	104,030.93
.....	.....	.....	.....	.....	.....	.....	.....	44,175.45
.....	.....	.....	.....	.....	.....	.....	.....	35,106.00
.....	.....	.....	.....	.....	.....	.....	.....	534.83
.....	.....	.....	.....	.....	.....	.....	.....	538,988.35
.....	.....	.....	.....	.....	.....	.....	.....	24,919.42
.....	.....	.....	.....	.....	.....	.....	.....	60,645.10
148,421.03	37,973.40	80,243.09	3,152.71	6,552.47	1,981,448.35	2.99	112,858.68	7,586,370.16

REVENUE RECEIVED DURING FISCAL YEAR 1949-50

Class of Revenue	Totals	General Account	Newfoundland	Nova Scotia	Prince Edward Island	New Brunswick	Manitoba	British Columbia	Yukon Territory	Northwest Territory
PRIVILEGES, LICENCES AND PERMITS—										
Fishing Licences	$83,246.25	.....	$3,219.00	$12,799.80	$1,441.00	$12,333.25	$26,244.00	$24,012.00	$2,446.20	$751.00
Modus Vivendi Licences	242.00	.....	.....	114.00	2.00	.....	.....	126.00	.....	.....
Oyster Leases	3,570.00	.....	.....	384.52	2,143.99	1,041.49	.....	.....	.....	.....
Trawler Licences	5,500.00	.....	.....	5,500.00	.....	.....	.....	.....	.....	.....
Rentals	6,153.19	.....	.....	3,660.09	333.21	1,558.89	.....	601.00	.....	.....
PROCEEDS FROM SALES—										
Sealskins	835,916.58	$835,916.58	.....	.....	.....	.....	.....	.....	.....	.....
Fingerlings and Fish Fry	1,428.77	.....	.....	250.00	255.05	923.72	.....	.....	.....	.....
Oyster Spats, etc	1,849.90	.....	.....	.....	1,849.90	.....	.....	.....	.....	.....
Bait	145,032.96	.....	145,032.96	.....	.....	.....	.....	.....	.....	.....
Sundry Sales	1,300.89	667.11	446.38	57.00	.....	.....	.....	130.40	.....	.....
SERVICES AND SERVICE FEES										
Canned Salmon Inspection Fees	7,299.54	.....	.....	.....	.....	.....	.....	7,299.54	.....	.....
Canned Herring Inspection Fees	394.55	.....	.....	.....	.....	.....	.....	394.55	.....	.....
Miscellaneous Services	4,204.00	523.20	2,488.56	20.00	.....	.....	.....	1,172.24	.....	.....
REFUNDS OF PREVIOUS YEARS' EXPENDITURE	26,879.82	26,868.17	.....	.....	11.65	.....	.....	.....	.....	.....
MISCELLANEOUS—										
Fines and Forfeitures										
Fisheries Act—Fines	21,767.00	.....	237.00	1,304.00	3,178.00	3,204.00	.....	13,806.00	28.00	10.00
Forfeitures	11,608.23	.....	.....	5.25	18.50	359.39	.....	11,210.09	15.00	.....
North Pacific Halibut Convention Act	1,405.23	.....	.....	.....	.....	.....	.....	1,405.23	.....	.....
Sundries	9,237.98	8,893.51	343.32	.55	.30	.30	.....	.....	.....	.....
Totals	$1,167,036.89	$872,868.57	$151,767.22	$24,095.21	$9,233.60	$19,421.04	$26,244.00	$60,157.05	$2,489.20	$761.00

REVENUE COLLECTED ANNUALLY BY THE FEDERAL GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION

Year	Fisheries Revenue and Fines and Forfeitures	Casual Revenue	Pelagic Sealing Revenue	Sale of Bait	Sundry Revenue	Totals
To 1948–49	$6,466,976.64	$342,409.39	$6,564,558.43	.....	$5,240,515.52	$18,614,459.98
1949–50	139,236.80	37,612.57	835,916.58	$145,032.96	9,237.98	1,167,036.89
Total	$6,606,213.44	$380,021.96	$7,400,475.01	$145,032.96	$5,249,753.50	$19,781,496.87

REVENUE COLLECTED BY THE FEDERAL GOVERNMENT ON ACCOUNT OF THE FISHERIES SERVICE SINCE CONFEDERATION

Summary by Provinces

General	$12,297,909.64
Newfoundland	151,767.22
Nova Scotia	968,479.51
Prince Edward Island	254,607.54
New Brunswick	826,170.28
Quebec	359,758.46
Ontario	561,559.44
Manitoba	365,588.50
Manitoba and Northwest Territories	7,416.45
Hudson Bay District	1,192.88
Saskatchewan	95,152.41
Alberta	234,710.87
British Columbia	3,618,522.94
Northwest Territories	14,048.78
Yukon Territory	24,611.95
Total	$19,781,496.87