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Fisheries Management in Canada 1880 - 1910

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Contents

Abstract

This report outlines Canadian approaches to fishery management measures from about 1880 to 1910. Events around the time of Confederation - concerns about overfishing and pollution, and the beginnings of aquaculture - had already given the Fisheries Act strong powers over licensing and management. A forceful Minister and Commissioner of Fisheries - Peter Mitchell and W. F. Whitcher - and early disputes with the United States had given the Fisheries Branch an active approach. During the three decades treated, department officials and Royal Commissioners fleshed out the Canadian approach to management - that is, a watchful concern with practically everything in sight, reaching beyond conservation to enhancement, quality of products, and social factors. Starting with the rivers and inshore fisheries, they wrote the first rules for scores of fisheries. Although the fisheries service grew fast and worked hard, the thoroughness of applying rules varied. Attempts at limiting the number of licences ran into trouble; yet the idea of limited entry, and a residual control of licences, persisted. Managers of the day wrote the regulations that dominated fishery management until after World War II. These early approaches still mark Canadian management. Although the divorce of fisheries science and management early in the 20th century has made it hard to quantify the effects of fisheries management, general observation of the salmon and other fisheries suggests that Canada guarded its fish resources and fishing communities better than the northern United States.

Résumé

Le présent document décrit les orientations ayant marqué la gestion des pêches au Canada entre environ 1880 et 1910. Compte tenu de divers phénomènes survenus à l'époque de la Confédération -inquiètudes au sujet de la surpêche et de la pollution, et début de l'aquiculture - on avait déjà intégré à la la loi sur les pêcheries (Fisheries Act) des pouvoirs fermes en matière de délivrance des permis et de gestion. La présence d'un Ministre et d'un commissaire aux pêches énergiques - Peter Mitchell et W. F. Whitcher - et les premiers conflits avec les États-Unis avaient amené la direction des pêches à assumer un rôle actif. Au cours des trois décennies considérées, les fonctionnaires du Ministère et les membres de diverses Commissions royales étoffent l'approche canadienne à la gestion des ressources halieutiques : avoir l'oeil sur à peu près tout et aller au-delà de la simple conservation pour considérer la mise en valeur, la qualité des produits et les aspects sociaux de la pêche. En commencant par les pêches côtières et celles d'eau douce, ils jettent les bases d'une réglementation qui finira par toucher un grand nombre de pêches. Toutefois, même si le service des pêches prend une ampleur rapide et travaille avec ardeur, l'application des règlements laisse à désirer. Les tentatives de limitation du nombre de permis restent vaines; pourtant, l'idée de restreindre l'accès à la pêche et une forme de mainmise sur les permis subsistent. Les gestionnaires de l'époque élaborent les règles qui vont régir l'exploitation des ressources halieutiques jusqu'après la Deuxième Guerre mondiale. Ces premières démarches marquent d'ailleurs encore la gestion des pêches au Canada. À cause du divorce survenu entre les sciences et la gestion halieutiques au début du XXe, il est difficile de quantifier les effets de cette dernière, mais l'observation générale de la pêche du saumon et de celle d'autres espèces révèle que les stocks de poisson et les communautés de pêcheurs du Canada semblent avoir été mieux protégés que ceux du nord des États-Unis.

Foreword

This manuscript stems from research carried out part-time from late 1979 through 1985, under contract for the Department of Fisheries and Oceans. Kenneth C. Lucas, Senior Assistant Deputy Minister in the latter 1970's (when fisheries administration came under the Department of Environment), was the main force in commissioning the research. Under a flexible arrangement with the Department, I did the historical work part-time, off and on, while devoting my main energies elsewhere.

I researched fisheries management from early days (pre-European) up through the 1970's, and was fortunate enough to interview many of the key figures in Canada's 20th century fishing history. I completed a manuscript from early days up to the 1950's; this awaits publication by the Department.

In the meantime, having rejoined the Department, I want to get the following extract out into the literature, since it deals with a key period. From the early 1880's to about 1910, Canada's three great fisheries - Atlantic, freshwater, and Pacific - took on characteristics of size, structure, and management which lasted in large part into the 1970's.

Despite all the Royal Commissions, Task Forces, and printed outpourings which clutter Canadian fishing history, I have found nowhere a good historical survey of Canadian fisheries. Therefore, I try above all to present a basic description of key facts.

This entails some costs to coherence. The industry's history was often fragmented and disjointed. If one attempts to trace it accurately, without glossing over the confusions and complications which litter the industry's past, the manuscript's readability must suffer. To plow through what follows, the reader may need a strong fisheries interest, if not dedication.

Because of the lack of previous surveys, I originally wanted to cite all possible references, to aid future researchers. But the sources are so many and disparate, footnoting everything would unduly clutter the text. Instead, I have put a brief commentary on main sources. Anyone interested to pin down a reference more closely may contact me.

Although I have some sort of reference to support every statement, this is no guarantee that the manuscript is free from error. Truth about fishery matters is sometimes hard to find; and this manuscript reflects my own interpretations and opinions, not necessarily official versions of policy or events. I would welcome any additional information about key events, and any photos or illustrations, for the period treated here or for other periods. General comments are also welcome.

Norwood Whynot designed and produced this report. Among the many others helpful to me in this work, I would like especially to thank K.C. Lucas, the late J. C. Stevenson, Roméo LeBlanc, Ciuineas Boyle, Claude Moise, Graham Durkin, Don Pepper, Nix Wadden, Dixi Lambert, John Camp, Charles Friend, Bill McMullon, and all the people I interviewed. I will thank the latter parties in detail when the longer version of this manuscript appears. Those interviewees who gave me the most relevant information for the period 1880-1910 included A. W. H. Needler, W. C. MacKenzie, W. E. Ricker, J. R. Smallwood, Wilfred Templeman, Ron MacLeod, Ed Moore, Aidan Maloney, John McCormack, and Homer Stevens. I also made use of interviews conducted by Ken Johnstone and Cam Stevenson with A. G. Huntsman and John Lamb.

Finally, I made much use both of Ken Johnstone's ***The Aquatic Explorers***, a history of the Fisheries Research Board of Canada, and of preparatory work he had done on a history of fisheries management, before his untimely death.

Introduction

The 1870's saw the end of an old set of fishery questions, and the start of a new set. For Europeans and North Americans, the Atlantic fishery had been a vital part of high policy. It was a chief provider of food, a nursery of naval power, and a forerunner of sovereignty.

But in the third quarter of the 19th century, as coal and steel began to power the economy, the marine economy of wood, wind, and water was starting to fade. The centre of gravity was shifting from the coast to the continent. Even the coastal provinces wanted to be part of the new continental industrialism.

The Treaty of Washington in 1871 resolved many of the triangular disputes between Canada, the United States, and Great Britain. By so doing, it removed the fishery from the centre of the diplomatic stage. By fits and starts, Canada and the U.S. worked out their Atlantic fishery disputes. No longer did presidents and prime ministers discuss fishery policy. No longer could the fishery, as in the 1850's, lever the U.S. into wide-scale free trade. In future years, the fishery could still provoke international tensions. Except in Newfoundland, however, it was never again such a major and continuous factor in high policy.

Although still important, the Atlantic fishery itself became typically more of a problem than a prize.

Up till the third quarter of the century, the Canadian Fisheries Branch, under the Department of Marine and Fisheries, had stressed the most local of matters, such as problems in salmon rivers, and the most international of matters, such as defending fisheries sovereignty against the United States. Between those extremes, research and management for the major sea fisheries such as cod and herring remained almost non-existent.

But in the late 1800's, the rapid development of lobster canning on the Atlantic and salmon canning on the Pacific helped change the picture. Canners were putting up plants in any empty cove. Industry capacity grew faster than catches. It took only two decades for both the lobster and salmon-canning industries to go from zero to practically maximum production. Then catches began to shrink, and plants to close. The dramatic growth and decline made visible the need for management.

At the same time, old problems in the established Atlantic fisheries started looking more serious to coastal people. The old marine economy had three pillars: fishing, boat-building, and the shipping trade. Now the last two were in decline. For many of those losing jobs and trade to steel vessels and to central Canadian industries, the fishery seemed their only chance.

Alarmed by reports of overfished lobster or declining shad or disappearing sturgeon, the Department of Marine and Fisheries passed regulations by the score. The rules became more and more detailed, sometimes taking a social or economic twist.

Besides conservation, the Department was beginning to recognize other problems with the Atlantic fishery - of under-development, of low-value products, of marketing.

The period from the 1880's to World War I instilled fundamental attitudes and regulations that in large part still prevail. Rather than following the laissez-faire approach typical in the neighboring United States, the Canadians tried to watch and regulate everything in sight.

Despite this widely shared attitude, the three Canadian regions and their sub-regions often differed in the strength and thoroughness of management. The fishery managers all tried, and all had their successes; but some more than others. The Maritimes (and the old colony of Newfoundland) were full of protestations about what should be done, often without result. In the freshwater region, as the provinces fought for more power, Ontario and Quebec took partial control of fishery management. They took few noteworthy steps, as Ontario allowed the sequential overfishing of Great Lakes species. On the Prairies, federal managers were more innovative, but often failed to make their regulations stick. Fishery managers on the Pacific, both federal and provincial, were most likely to take hold and do something thoroughly.

The partial differences in management reflected

the different paths the different areas were already taking. In the decades before World War I, the general Atlantic economy began a slow decline in vigor. Against this background, the fishery was largely a story of fragmentation, depletion, and alarm. Around the lower Great Lakes, the general strength of the economy buffered the fishery problems, which caused less concern. On the scattered lakes of the Prairies, the industry sometimes resembled the weaker, more forgotten parts of the Maritimes fishery. In British Columbia, the new fishery was different, more concentrated, with a critical mass that reflected itself in management. While Atlantic and Prairie managers were forever lecturing, cajoling, and bewailing the industry, on the Pacific the industry as often as not led the managers.

The following pages deal with:

I. The Atlantic; although this also includes certain national matters such as the succession of Ministers;

II. Freshwater;

III. The Pacific;

IV. The Nature of Early Regulation.

In each of the first three sections, the more general subjects appear at the start, followed by the specifics of particular fisheries.

The Atlantic

Much of the western world suffered an economic downturn in the last quarter of the 19th century. For the Atlantic coast, the decline of the old marine economy made matters worse. Lumbering, shipbuilding, and the carrying trade gradually withered. British timber preferences had ended, and in any case, the timber industry was moving on to new forests of the interior.

St. John's, Saint John, and Halifax had been centres of the Atlantic marine economy. At the end of the 1870's, the Maritimes still had the third or fourth biggest fleet in the world. But new roads, railways, and industries were building up the continental economy, leaving the old coastal centres on the fringes. Some growth took place on the coast. Industrialism boosted the coal and steel industry in Nova Scotia. A number of small manufacturing companies started up in the Maritimes. But the main growth took place in Quebec and Ontario. It seemed easier for steel to move to central Canada than for industry to move to the Maritimes. After the failure of Reciprocity, or free trade, Canada's new "National Policy" on tariffs starting in 1879 increased costs to Maritime fishermen and farmers, and impeded Maritime trading. It worsened an already weakening economy.

The National Policy later took on other elements, including completion of the government-aided Canadian Pacific Railway, and subsidization of fast steamer service to Europe and Asia. This may have helped exports, but did nothing for Maritime builders of wooden boats. Even in the coastal trade, roads, trains, and steamships were gradually taking over the carrying trade. They had clear advantages. Schooners were prey to fire and storm and shipwreck. (For example, the Newfoundland seal fishery from 1810 to 1870 lost an estimated 400 vessels and 1000 men.) Safer, more reliable steamship service to the West Indies, Brazil, and other overseas destinations cut into the market for wooden vessels. Some vessel owners became more interested in pursuing investment opportunities on shore. Many shipyards closed.

Only one pillar of the old marine economy remained - the fishery; but it was unable by itself to support the old marine prosperity. As coastal dependence on the fishery increased, uneasiness grew about the resources. Depletion of rivers and downturns in sea fisheries became more noticeable.

Coastal population was still increasing: in the Maritimes from less than 800,000 in 1871 to more than 900,000 in 1911; in Newfoundland, from about 197,000 in 1884 to about 243,000 in 1911.

Comments in the Newfoundland House of Assembly in 1864 put clearly the problem that would bedevil the fisheries for the next century: if fish production could at most remain steady, the increase in human population must lead to bad results.

RECIPROCITY'S DEATH RATTLE

The Treaty of Washington in effect from 1873 had restored fisheries reciprocity only. Americans could fish in Canadian waters, and the Canadian fishing industry could market fish tariff-free in the U.S. But the United States was now losing interest in fishing off Canada and Newfoundland.

New England fishermen in the 1880's still resented "unfair" Canadian competition under fisheries reciprocity. Americans also got worked up about the Halifax Award of 1877. This was a $5.5 million payment to Canada for fishing privileges to U.S. vessels. (Converted to a subsidy, it helped enlarge Canada's fleet by some 140 vessels.) New Englanders thought it an outrageously high price. At the same time, the growth of the fresh-fish trade and other changes lessened the American desire to fish off Canada and Newfoundland.

In 1883, a joint resolution of the Senate and the House of Representatives gave notice that the fishing articles of the Treaty of Washington would end, effective 1885. In 1887, Spencer Baird, the U.S. Commissioner of Fish and Fisheries, summarized the reasons for New England's loss of interest in British North American waters. In essence, there were now fewer Canadian fish within the three-mile limit, and less American need of them either for food or bait.

The halibut fishery near the provinces had dwindled. Since 1875, American fishermen had been finding halibut in deep water only. This in turn lessened the need for bait from BNA inshore waters. In the offshore halibut fishery, vessels needed only a little bait, one or two days' worth; they then used "refuse fish" or small halibut for bait.

Offshore cod vessels from Gloucester, using trawls (i.e. longlines) continued to use fresh bait from the provinces. Many of the Gloucester crews were Canadians, and urged the owners to get fresh bait in Canada largely because they had relatives there. But other cod vessels tended to use hand lines and to use salt bait.

Inshore in New England, gillnets and their catches were increasing. This further cut down the need for frozen bait herring from New Brunswick, Nova Scotia, and Newfoundland.

About all the Americans now wanted within the three-mile limit, said Baird, was mackerel. But there again, they now had bigger vessels and purse seines with which to fish their own mackerel offshore. Most American fishermen fished no closer than 25 to 30 miles to the Canadian shore; and they were most likely to be 100 to 200 miles from shore. Recently, they had been catching more mackerel off the U.S. itself.

The 1818 Convention still permitted U.S. vessels to fish freely along parts of the British North American coast. The Treaty Shore included the Magdalens, part of Newfoundland, the Quebec North Shore, and Labrador. But in these places, said Baird, the fishery had dwindled to little.

In short, bait from Canada now had no vital importance, especially since the agitation about Canadian bait had spurred the bait fishery to increase in Maine and Massachusetts. Writing two years after the fact, he concluded that abrogating the fishery provisions of the Treaty of Washington had had little effect on U.S. fisheries.

SALTFISH SLOWS DOWN

But the loss of the Treaty did affect Canadian fishermen. After the abrogation, the Americans imposed heavy duties on fish products. Market trends themselves - the growing use of fresh fish and meat - also hurt the saltfish fishery. As America began producing sugar beets, the prosperity of West Indies planters declined. This too weakened the market for BNA salt fish. The accompanying decline of wooden shipbuilding and shipping made it harder to earn a living by combining fishing with other trades.

The fishery remained a great employer. With its manifold linkages to boatbuilders, fish dealers, boatbuilders, equipment makers, and local tradesmen of all sorts, it underlay most of the coastal economy. But now it was taking on more clearly a role that became traditional: the catch-basin, the employer of last resort.

SOME NEW GROWTH

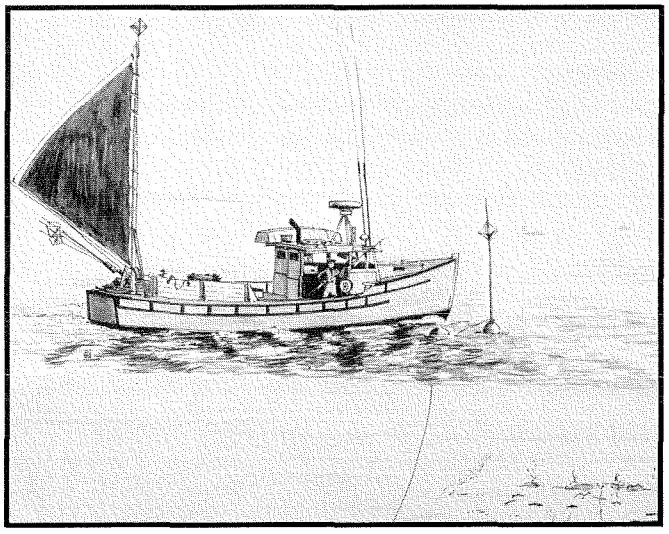
Although from 1880 to 1910 the number of Atlantic boats and fishermen sharply increased, landings increased more slowly. As the saltfish trade began to drift, growth came elsewhere. The basic structure of the industry remained relatively stable for groundfish, with some change in the herring industry, and revolutionary growth in the lobster fishery. The lobster boom built hundreds of canneries, mostly small.

In another development, canners in Maine started packing juvenile herring as sardines, and bought the raw fish from Canadians near the border, as well as Americans. Herring canneries spread to the Canadian side. These were genuine fish factories, with plant workers on a piece-work or wage basis. In the pelagic fishery, American steamers around 1888 began using purse seines of 190-225 fathoms. The mechanical "reduction" of fish and offal into fertilizer spread eastward. Starting in the U.S., cold storage plants appeared for fish and bait. As the century drew to a close, parts of the fishery were looking more "industrial".

At the same time, though, the big merchant firms of the Gulf and Newfoundland were changing their role. Cod markets were soft. Prices in 1880 dropped to their lowest levels since 1830. In 1886, the two Robin firms in the Gulf ran into trouble, as did the Le Boutillier company. Competing firms were more and more a threat. The Robin interests soon went through reorganization and a merger. They turned more towards retail business, although retaining cod production. In Newfoundland, some St. John's firms paid less attention to production and more to buying and selling.

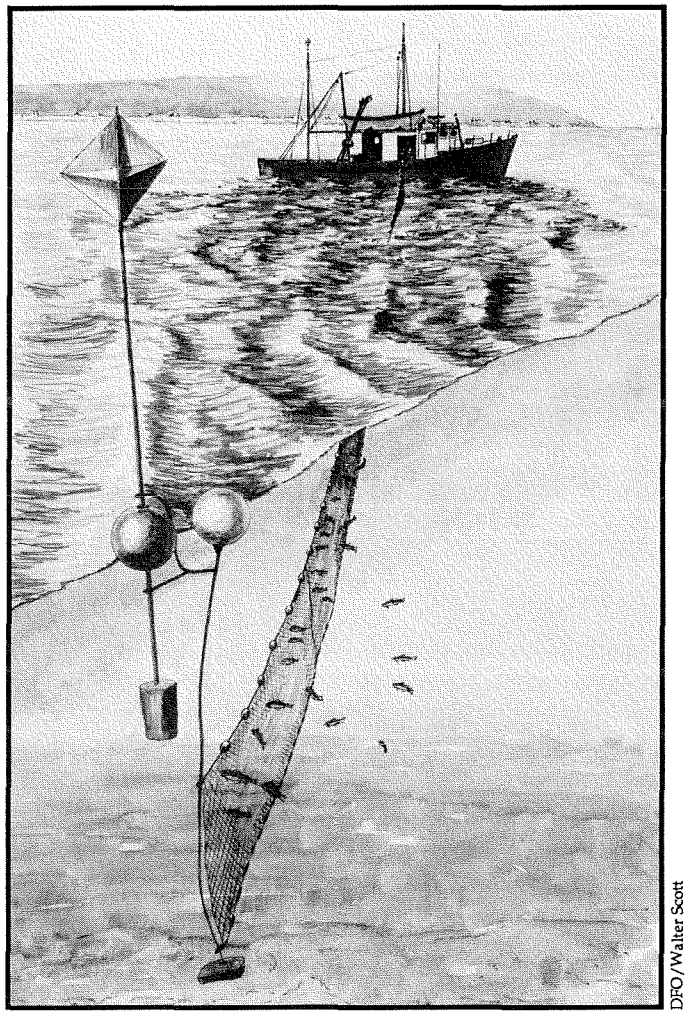
In the southern Maritimes, no major firm had taken a commanding lead as the Robins did in the Gulf. But Lunenburgers collectively now led the offshore, larger-vessel fishery, with schooners of 80-100 tons. As the American fresh-fish industry grew, some Nova Scotians also began shipping fresh fish to market. A few trawlers began showing up after the turn of the century for the fresh-fish trade.

Generally, however, the industry throughout suffered from lack of capital. The Atlantic fleet everywhere remained mainly an inshore one, with thousands of small open boats. But after the turn of the century, as gas engines began to appear, small boats became more numerous and more mobile. Some began to be partly decked over, as in the "Cape Island" style



DFO/Walter Scott

A Cape Island boat of the 1970's, longlining.



DFO/Walter Scott

Small-boat gillnetting in the 1970's.

boat of Nova Scotia, appearing early in the new century.

Joining handlines and "trawls" (i.e. longlines) on the fishing grounds, cod traps and gillnets were becoming more common. Captain Gordon of the Fisheries Protection Service reported in 1890 that the herring and mackerel fishery on Canada's Atlantic coast probably used in total 1,110 miles of nets.

REGULATIONS FEW BUT WIDE-RANGING

Along with limited growth in the industry came a great growth in regulation. This stemmed from increased awareness of problems, combined with the great potential strength of the Fisheries Act.

This power was already apparent at the start of the period.

In the 1870's, regulations remained in one way simple. The rules for the entire Dominion took only a few pages. But in another way, the regulations were deep.

The Fisheries Branch already used almost every method of regulation that would appear later. They could control who would fish, how, when, where, and for what. The department already granted licences for both common property and quasi-private fisheries. It already applied what we now call the "user-pay" principle, with a landings tax on salmon.

Outside the purview of the Fisheries Act, the Department was already pushing for international conservation. Minister Peter Mitchell in 1872 called for more American cooperation. Otherwise, U.S. fishing, as at border areas in Lake Erie and Lake Huron, could override the effect of Canadian regulations.

Despite their variety and potential, Canadian regulations remained largely ad hoc. Most attention went to the river and estuary fisheries, the most vulnerable to overfishing and pollution. A few examples typify regulations of the time:

- In 1875 Commissioner of Fisheries W.F. Whitcher sent a circular to fishery officers, asking about the effect of bultows (i.e. longlines, also known as trawls). The answers must have reassured him, since no regulation came into effect against bultows.

-A landings tax was enacted by Order in Council of July 22, 1875. The tax on salmon caught by net was to be 40 cents per 200 pounds; on bass, 20 cents per 200 pounds.

-Circulars from Whitcher in 1875 and 1876 advised his Quebec officers to be discreet in enforcing the Sunday close on salmon fishing, so long as rivers were getting enough escapement. But he told them to be harsh on mill rubbish.

-Another 1876 circular from Whitcher advised

fishery officers in Nova Scotia and New Brunswick that there would be no more keeping of half the fine assessed against anyone. Thus ended a practice that had appeared in provincial regulations long before Confederation.

-On 20 April 1876, an Order-in-Council forbade the use of explosives in fishing. Various other regulations in this decade went against the use of seines and enclosures.

The Annual Report of 1886 summarized the Dominion's main fishery laws on a single page, as follows:

THE FISHERY LAWS OF THE DOMINION.

TABLE OF CLOSE SEASONS ON 1st JANUARY, 1886.

Kinds of Fish.	Ontario.	Quebec.	Nova Scotia.	New Brunswick.	P. E. Island.
Salmon (net fishing)		Aug. 1 to May 1.	Aug. 15 to March 1.	Aug. 15 to March 1.	
do (angling)		Sept. 1 to May 1.	Sept. 15 to Feb. 1.	Sept. 15 to Feb. 1.	
do do Ristigouche River		Aug. 15 to May 1.		Aug. 15 to May 1.	
Speckled Trout (*Salmo Fontinalis*)	Sept. 15 to May 1.	Oct. 1 to Jan. 1.			Oct. 1 to Dec. 1.
Large Grey Trout, Lunge and Winnifish.		Oct. 15 to Dec. 1.			
Pickerel (Doré)	April 15 to May 15.	April 15 to May 15.			
Bass and Maskinongé	April 15 to June 15.	April 15 to June 15.			
Whitefish and Salmon Trout	Nov. 1 to Nov. 30.				
Whitefish		Nov. 10 to Dec. 1.			
Sea Bass				March 1 to Oct. 1.	
Smelts			April 15 to May 15.	April 15 to May 15.	
		Bag net fishing prohibited, except under license.			
Lobsters		Aug. 20 to April 20.	Aug. 1 to April 1. (West coast) Aug. 20 to April 20. (North coast)	Aug. 1 to April 1. (South coast) Aug. 20 to April 20. (North coast)	Aug. 20 to April 20.
Sturgeon				Aug. 31 to May 1.	
Oysters		June 1 to Sept. 15.	June 1 to Sept. 15.	June 1 to Sept. 15.	June 1 to Sept. 15.

NOTE.—The fishery laws only partially extended to British Columbia and Manitoba. Close seasons in the latter province are: Whitefish, from 20th October to 1st November; and speckled trout, from 1s October to 1st January.

SYNOPSIS OF FISHERY LAWS.

Net fishing of any kind is prohibited in public waters, except under leases or licenses.

The size of nets is regulated so as to prevent the killing of young fish. Nets cannot be set or seines used so as to bar channels or bays.

A general weekly close time is provided in addition to special close seasons.

The use of explosive or poisonous substances for taking fish is illegal.

Mill-dams must be provided with efficient fish-passes. Models or drawings will be furnished by the Department on application.

The above enactments and close seasons are supplemented in special cases, under authority of the Fisheries Act, by a total prohibition of fishing for stated periods.

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Even if the regulations had a helter-skelter look, deeper thinking underlay them. Whitcher had been present at the creation of the federal power over leases and licenses. He wanted a better system with more inherent self-regulation.

As will appear in the full version of this book, there were many precedents for licensing and leasing before Confederation, stretching back into the days of New France and the British colonies before the American Revolution. Remnants had remained especially in the river fisheries of New Brunswick and Lower Canada. The beginnings of Canadian aquaculture in 1857 heightened interest in leases. An 1859 act for the United Canadas allowed for "special fishing leases and licences on lands belonging to the Crown, for any term not exceeding nine years." Whitcher, in charge of fisheries superintendents for Upper and Lower Canada, probably pushed for the 1865 Act which allowed licences and leases anywhere, prohibited deleterious substances in fishery waters, and formed the basis of the post-Confederation, 1868 Fisheries Act.

Whitcher headed the fisheries branch after Confederation. The Annual Reports of 1873 and 1874 reveal much of his thinking about licences and leases.

In 1873, a number of Nova Scotians petitioned Mitchell, the Minister, about the decline of the river fisheries, the scarcity of wardens, and other problems. Whitcher responded to Mitchell that yes, there were few wardens. More serious, however, was the failure to apply the Ontario and Quebec system to Nova Scotia and New Brunswick, since giving out leases and licenses created less fuss and brought more revenue.

He noted in the Annual Report that "the angling divisions of several salmon rivers on the St. Lawrence are now vacant, and others will be disposable in the course of next spring. These privileges it is proposed to advertise, and to invite offers to rent the same. When occupied by sportsmen the rivers receive increased protection; and besides contributing to the fishery funds they also become subject to local guardianship at private cost, and in that respect cease to be a charge on the public revenue."

Elsewhere, he dwelt on the removal of salmon nets from the Restigouche and Moisie rivers, and how it had increased the fish.

> *At both places it is now clearly proved that immoderate netting is a serious hindrance to the restoration of the salmon fishery, and a positive disadvantage to the fishermen themselves. It also is quite as clearly established that a moderate quantity of nets, judiciously situated, render at once a far more profitable return to the owners and admit of maintaining a permanent stock of mature salmon. This fact has a peculiar bearing on the regulation of the salmon fishery. The occupancy of salmon stands under formal titles enables the occupiers to economise both their own capital and labor and the public property in salmon. Where the fishery fishery is carried on in a desultory and improvident manner, under such incitements toexcess as are created by contentious rivalry and the prospect of mere temporary gain, it is extremely difficult to control fishing operations within reasonable bounds. But, on the other hand, where occupants can rely on the permanence of their holdings, and enjoy in successive years the benefit of their own moderation in each preceding season, the Department finds very little difficulty in controlling the pursuit.*

Whitcher added that "it is not easy to convince fishermen how much cheaper and more profitable it is in their own interest to conform to the same principles on which legal protection is founded and the departmental regulations are enforced. Nothing short of the plainest examples appear to be sufficient to attract their earnest attention." But examples like the increase in Moisie River salmon should do it.

Another complaint of Whitcher's has yet to find a solution. He expressed surprise that fishermen failed to realize what the department was doing for them.

In the same 1873 Annual Report, Whitcher wrote that:

> *...it is respectfully suggested that the system of leasing and licensing fishery privileges under the Fisheries Act, already introduced in the Provinces of Nova Scotia and New Brunswick, be now further extended conformably with the practice existing in the Provinces of Ontario and Quebec.*
>
> *In these Provinces the system has been brought gradually into operation since the year 1856. It is confined almost exclusively to salmon and sea-trout fishery in Quebec, and to white fish and salmon trout fishery in Ontario. There is still open a large field for its extension, without encroaching on the deep sea fisheries for cod, halibut, mackerel, herring and other scale fishes.*
>
> *At the date of Confederation a similar principle existed in Nova Scotia and New Brunswick, but was limited in its application to very few instances. The Provincial Government in Nova Scotia had issued one lease of oyster beds; and the Government of New Brunswick had granted one lease of salmon fishery, at nominal rents. Besides these dues on leases a small tax on salmon nets was payable to the*

municipal authorities; and under an Imperial grant of fishery rights in St. John Harbor, the civic corporation rented fishing berths to the local fishermen by lottery, realizing about $2,500 per annum. Also fishery rents of $598.78 per annum were paid by the salmon fishers on the Naval Reserve at Portage Island, N.B., under the tile of fishing "lots" from the Admiralty, which rents were applied to local purposes. Since Confederation some special licenses for trap-nets were issued in Nova Scotia, and in New Brunswick several season licenses for salmon fishing with nets, and a few leases for salmon angling have been granted.

The ***Fisheries Act*** *evidently contemplates the system of granting titles for fishing privileges as a basis of administration. Certain of its provisions are predicated on the supposition that leasing and licensing would become general, providing always for necessary exceptions as to legal titles, prior occupancy and preferential claims.*

It is unnecessary, after several years of its beneficial operation, even though but partially carried out, to explain at length its advantages. Primarily, it systematizes the fishing business, and it also induces private expenditure both in guarding and improving the streams, which outlay would otherwise require to be defrayed from public funds. Secondarily, it promotes investment of capital, and gives permanence and security to fishing industries, enhancing the value of fishing privileges to both individual fishermen and the public, which hitherto had but a fitful existence and were fast becoming altogether unproductive. Revenue is only an incident and not a main object.

There were reasons of state for not superseding the Provincial Fishery Laws in Nova Scotia and New Brunswick by Dominion legislation when the Maritime Provinces were confederated. Like reasons have since prevented anything further being done beyond merely introducing the leasing and licensing principle into those provinces in a few instances where precedents had been set by the Provincial Governments. This Department essayed on two occasions to advance another step, but made no progress....

Legislation is not required; no assimilation of laws is requisite. All that is necessary is, by Departmental action, to proceed with leasing and licensing fishery stations in those provinces just as has been done in Ontario and Quebec. But, as the matter has been considered in the light of a "policy," it may be deemed advisable to confirm the proposed action by an Order in Council, in the form of a Fishery Regulation, prohibiting such kinds of fishing as it is intended to lease or licence, except under authority of leases of licenses. This is the same course as was pursued for Ontario and Quebec.

It may be advisable to act first on the numerous applications which are fyled, and in other instances where no adverse circumstances of conflicting demands exist. Attention should be directed to carrying out this system with every regard for the obvious desirability of enlisting the sympathies of the public and promoting the truest interests of the fishermen. There should be a thorough examination into each case; and the greatest possible care and precautions should be observed in order to avoid doing violence to the prejudices, or injury to the position and interests of persons affected thereby. Scrupulous regard will require to be paid to priority of occupation and recognized user. A careful distinction must be observed between the deep-sea and inland and the estuary and river fishings. These latter should alone, in my humble opinion, be subject (for the present at least) to the system of occupation under lease or license.

The undersigned considers it undesirable to anticipate the production of direct revenue from fishery rentals, the rates of which are for the most part nominal. Any system of regulation and economic use of fishing privileges under titles may be more profitable adapted as an auxiliary to protection of inland fisheries, and to enhance their productive value. It is not improbable, however, that in due course of time sufficient funds may be derived to render the service self-sustaining.

Except that they are better written, Whitcher's words could have appeared in any number of studies in the 1970's and 1980's about limited entry, quasi-property rights, and "resource rent," or "cost-recovery." From the beginning, Whitcher imparted the idea of strict licensing to the fisheries service. Besides conservation, licences were important for fisheries sovereignty. In the first few years after Confederation, they were vital in controlling American fishing vessels.

But licences failed to work out as Whitcher wanted. Except in a few river and inshore fisheries, leases never become common on the Atlantic and licences remained mainly a formality for a century. They existed without controlling the industry.

On the Pacific though, they soon became important in fishery management. And in the 1960's and 70's, licences reasserted themselves on the Atlantic, as "limited entry" became the fundamental tool of fishery management.

THE MARCH OF MINISTERS

In the late 1880's and the 1890's, the Fisheries Branch set out to make regulations more comprehensive. There appears to have been little downward push from Ministers about conservation. The impetus came from wide concern about fishery depletion, and from fishery officers putting their concerns up the line.

If the impetus to conservation came from the fishery officers, whence came their impetus? Besides their own good will, it must bave been the stamp set on the service by the first Minister, Peter Mitchell, and especially by the first Commissioner of Fisheries, William F. Whitcher.

The long-serving William Smith remained Deputy Minister of Marine and Fisheries from 1867 until 1896, except for an 8-year interruption, starting in 1884. But the key fisheries figure was Whitcher, as the larger volume of this book will make clear. He dealt with fisheries for the United Canadas, including fundamental legislation. He was present at the creation of the federal Fisheries Act. He then headed up fisheries from 1868 to 1882. From 1873, he signed his annual reports to the Minister as Commissioner of Fisheries. Under Mitchell, he set up the fisheries service. He pushed for compulsory inspection of fish products. He imparted strongly the idea of licensing and leasing fisheries. He backed the establishing of an extensive network of hatcheries and fishways. He was Commissioner during the heated Canada-United States fishery disputes 1867-71, which confirmed Canada's fisheries sovereignty. He helped to win, in 1884, the first setting-up of Fisheries as a separate department.

With exceptions such as George Foster, Charles Tupper, and Louis-Phillipe Brodeur, Ministers in the decades after Peter Mitchell generally left no lasting mark on fisheries. Most had a fairly brief tenure. And all had a host of marine matters to deal with. The official list included:

> *Sea Coast and Inland Fisheries, Trinity Houses, Trinity Boards, Pilots, Decayed Pilot's Funds, Beacons, Buoys, Lights and Lighthouses and their maintenance, Harbours, Ports, Piers, Wharves, Steamers and Vessels belonging to the Government of Canada, except gunboats or other vessels of war, harbour commissioners, harbour masters, classification of vessels, examination and granting of certificates of masters and mates, and others in the merchant service, shipping masters and shipping offices, inspection of steamboats, and board of steamboat inspection, enquiries into causes of shipwrecks, establishment, regulation and maintenance of marine and seamen's hospitals, and care of distressed seamen, and generally such matters as refer to the marine and navigation of Canada.*

After Peter Mitchell got the Department under way, another New Brunswicker, Albert J. Smith, served as Marine and Fisheries Minister from 1873 to 1878, in the Alexander Mackenzie government. (As Premier of New Brunswick, Smith had almost prevented Confederation, which he regarded as a devious scheme from "the oily brains of Canadian politicians".)

The restored Macdonald government then appointed James C. Pope, the shipowner and former premier who brought Prince Edward Island into Confederation. Pope remained Minister until 1882.

A.W. MacLelan of Nova Scotia served as Minister from 1882 to 1885. George E. Foster of New Brunswick took over for the years 1885-1888. Foster entered politics mainly by chance. Prime Minister Sir John A. Macdonald happened to pass by when Foster was giving a public lecture on temperance. Though no abstainer himself, Macdonald found Foster's speaking impressive, and ordered "Get him into politics." Foster entered Parliament a few months later, and soon became Minister. It was the start of a distinguished career, including many years as Minister of Finance.

Charles Hibbert Tupper replaced Foster in 1888, and remained Minister of Marine and Fisheries until 1894. (His father Charles Tupper was the Nova Scotia Premier who had fought earlier fisheries battles; and in 1896 the elder Tupper served briefly as Prime Minister.)

John Costigan of New Brunswick, known as a spokesman for Irish Roman Catholics in Canada, took over until 1896. In the new Liberal government under Wilfred Laurier, Louis H. Davies of Prince Edward Island became Minister.

After Davies was appointed to the Supreme Court, James Sutherland of Ontario, in 1902, took over the portfolio for ten months, then moved to Public Works. A Quebec representative, J. Raymond Prefontaine, became Minister on November 11, 1902, and continued until his death in 1905. He was the first Minister to visit British Columbia.

Laurier himself took over as Minister for two months. In February, 1906, he appointed his protege Louis Philippe Brodeur, who took over until 1911. During his tenure, Parliament in 1908 set up the standing Committee on Marine and Fisheries. Brodeur was a

was a key figure in creating the Canadian navy.

A SEMI-SEPARATE DEPARTMENT OF FISHERIES

By Brodeur's time, the fisheries service had doubled in size. It was already substantial at the outset of the period. By 1881, Whitcher could report that the fisheries branch employed nearly 700 "highly-intelligent" officers, overseeing a $16 million industry that exported 40 percent of production.

In the 1881 Annual Report he made clear his displeasure about insufficient respect given to the fisheries side of the Department in the annual report. The Fisheries Statements were "sandwiched in between 'the report of the director of the time ball at St. John, N.B.,' and sub-reports on 'sundry marine hospitals'," said Whitcher, going on to praise his fishery officers, point out the importance of the fishing industry, and imply criticism of Deputy Minister Smith.

Whatever the influence of Whitcher's outburst, in 1884 the government briefly divided Marine and Fisheries into two sections, each with its own Deputy Minister. John Tilton became Deputy Minister of fisheries until he retired in 1891. The Department reunited, and William Smith in 1892 again became Deputy Minister of Marine and Fisheries until he retired in 1896. F. Gourdeau then took over until 1909, followed by G.J. Desbarats.

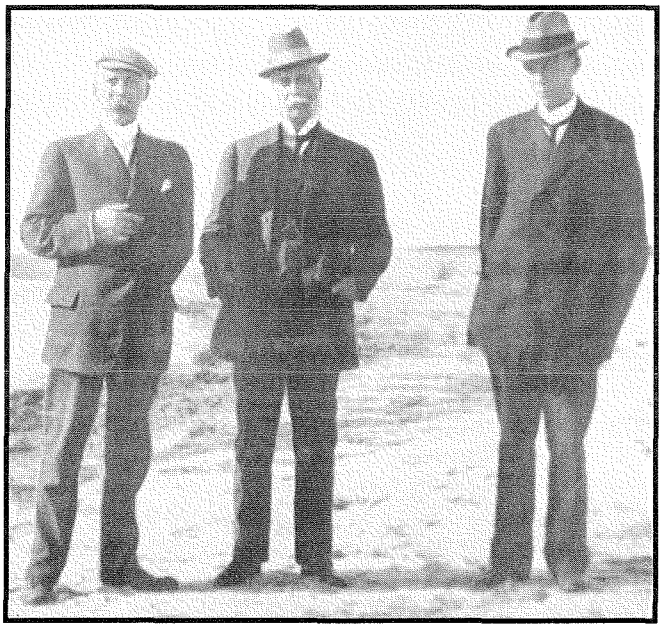
Whitcher last signed the Annual Report as Commissioner of Fisheries in 1882. The title dropped out of sight during the years when Fisheries was a separate department, and then returned in 1893.

EDWARD E. PRINCE

That year the Department recruited Edward E. Prince, then teaching zoology at St. Mungo's College, Glasgow, Scotland, to serve as Commissioner of Fisheries. When Samuel Wilmot retired in 1895, Prince also took over fish culture.

Prince became the dominant figure in fisheries management until World War I. He took an interest in every aspect of the fisheries. He wrote paper after paper on fisheries management and biology. And he chaired many of the Royal Commissions which set the fishery regulations that still prevail.

Although he also took on the title of General Inspector, Prince never occupied himself greatly with day-to-day management. He recognized the need of licence limitation in the lobster fishery, but was never able to carry it through. He recognized underdevelopment in the fisheries, but again, the Department's work was less than thorough.

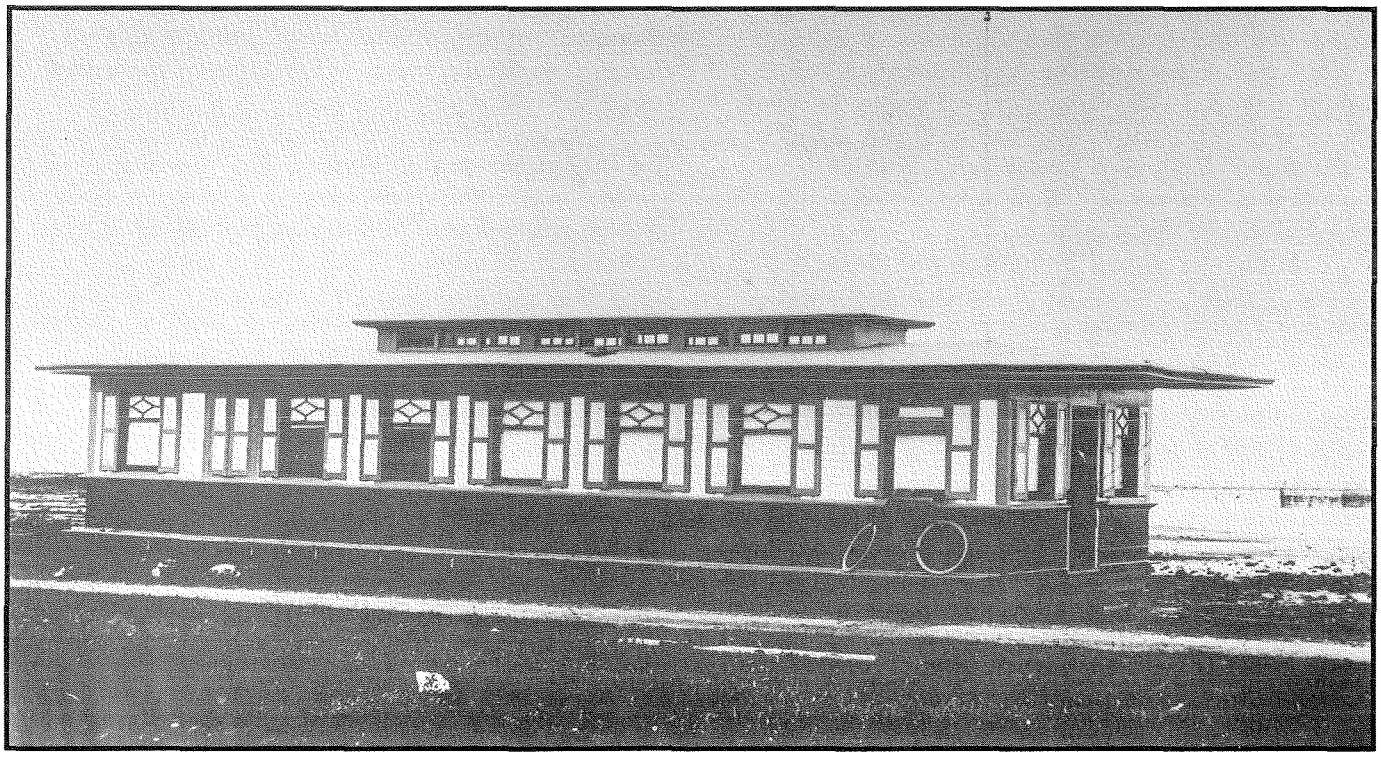


Professor Prince (left), ex-Chief Justice McGuire, and Dr. Euston Sisley at Big Quill Lake for the 1910 Alberta and Saskatchewan Fisheries Commission.

In 1909, Prince moved entirely out of executive duties to international and commission work. In his later career, one gets the impression that Prince almost retreated to his study, leaving the day-to-day work to W. A. Found and others. Found, who joined the fisheries service in 1898 as a secretary, by World War I was rising in administrative power. Some of Prince's successors tended to describe "the genial professor" in slightly irreverent tones. A.G. Huntsman, the scientist who most influenced fisheries research in the first part of the 20th century, downplayed Prince's abilities as a scientist, though noting his abilities as a naturalist. Still, Prince remains a fundamental figure in both management and science.

THE CANADIAN BIOLOGICAL STATION

Until the late 19th century, fisheries management had little connection with science. But fisheries biology was growing as a science overseas. In England, the Marine Biological Association was formed in 1884, and a fisheries laboratory took shape in Plymouth four years later. At Plymouth, E.W.L. Holt took a fresh approach as described by C.P. Idyll: "to get out of the laboratory and into the fishery - on the boats and on the docks. By calculating the average catch per unit of fishing effort, Holt was able to demonstrate that there had been a real reduction in stocks." Holt did pioneering work on



The first biological station.

biology and abundance and proposed some of the earliest modern regulations. The Dave C.G.J. Peterson was also beginning fundamental work on population dynamics, and the need to control fishing.

In Canada, there was also scientific interest. Earlier, Whitcher praised the fisheries work of the Natural History Society of Montreal. Now Prince and others spread the idea of a biological station. The Royal Society of Canada took up the cause. In 1898, the Minister of Marine and Fisheries, Sir L. H. Davies, approved a proposal by the Royal Society, and Parliament in June authorized $7,000 to pay for construction and one year's operation of a floating laboratory based at St. Andrews, N.B.

Built in 1899, the floating laboratory spent time at her home base in St. Andrews, at Canso, N.S., at Malpeque, Prince Edward Island (working on oysters), and at Gaspe. She sprang a leak in 1907 while being towed up the St. Lawrence River and in 1908 disappeared from the records. In 1908, the fisheries service built a shore laboratory at St. Andrews, and another at Nanaimo on Vancouver Island.

Although Ontario had by now strongly asserted itself in fishery matters, the federal government, pushed by Prince, in 1901 set up a biological station at Go Home Bay on Georgian Bay. This station continued until 1913.

The first biological station at St. Andrews and its followers kept a certain distance from the Department and the fishing industry. As suggested by the Royal Society, the first station was administered by a special board. This included Prince as Director, and several university professors. The station was to work closely with Canadian universities; their investigators would do as much of the scientific work as was practical.

The Board of Management of the Biological Station soon became the Biological Board of Canada. Although Prince was the Biological Board's Chairman from 1900 to 1921, the scientists kept an arm's-length relation with the Department, and in 1912 won administrative independence.

Prince himself was interested in fish populations; and to the industry, abundance was all-important. But few Board scientists yet worried about the concrete questions of abundance that we now see as vital to the fishing industry - how many fish, how to control their numbers.

While the fisheries service did its rough and ready experiments in management, university professors and their students mainly left management aside and continued basic research on biology, migrations, and so on. The idea was always that the research would ultimately benefit the resource and the industry. But it took decades before the industry or the Depart-

ment gained much influence on the workings of the Board.

Eminent among the early scientists was A.P. Knight of Queen's University. In 1901 began the scientific series Contributions to Canadian Biology, which in 1925 changed its title to Contributions to Canadian Biology and Fisheries, and in 1934 to Journal of the Biological Board of Canada.

At the end of the 19th century and the early years of the 20th century, the fisheries service itself operated a small fisheries museum in Ottawa.

FEAR OF OVERFISHING

If science had little effect on fisheries management, then where did the regulations come from, in this period of coast-to-coast regulation-writing? From local complaints, from Royal Commissions, and from fishery officers.

The reports from Whitcher's fishery officers and those who came later remain impressive today. Clearly written, they bespeak closeness to the fisheries, awareness of their complexities, and a concern with concrete matters and the actual lives of people. The officers watched, they listened, they made suggestions, just as Royal Commissions often did in a more organized way. If departmental and ministerial judgement found the action desirable, another regulation entered the books.

Provincial officials had bemoaned depletion as early as mid-century. In the 1870's, Whitcher pointed to destructive practices in the oyster fishery, and feared the same for lobster. New fishing power was a factor. In 1874, Whitcher had this to say about seals:

> *The inevitable fate attending excessive pursuit of the fauna of field forest and flood, threatens speedy extinction of seals in the Gulf of St. Lawrence. While seal hunting on the ice was carried on from sailing vessels and by shore-nets, the vicissitudes of the pursuit afforded some natural protection to this animal, and its numbers kept up a flagging pace with the legitimate annual destruction. But the recent employment of steamers has overcome many former difficulties, and enables the sealers to pursue their prey with indiscriminate slaughter. ... There were at one time last season engaged in this destructive business, on the Arctic seal grounds, nearly forty steamers and as many sailing crafts from various European ports; and so great was the havoc committed that it has excited universal apprehension. About the same time extensive operations by American steamers in the Gulf of St. Lawrence also attracted attention.*

Whitcher commented that he could not recommend restricting Canadian sealers until, through mechanisms of the Treaty of Washington, the American sealers also faced controls.

By the 1880's, overfishing and depletion worried the Department as never before. The lobster catch had peaked in the 1880's; now signs of decline were obvious. Newfoundland cod had dropped off enough to cause alarm in Canada. There were reports -some backed by statistics, some not - of decline in Great Lakes salmon and other lake species, whales, walrus, mackerel, sturgeon, and various inshore species. Commercial fisheries for some species had only recently developed, and already they seemed to be wearing out.

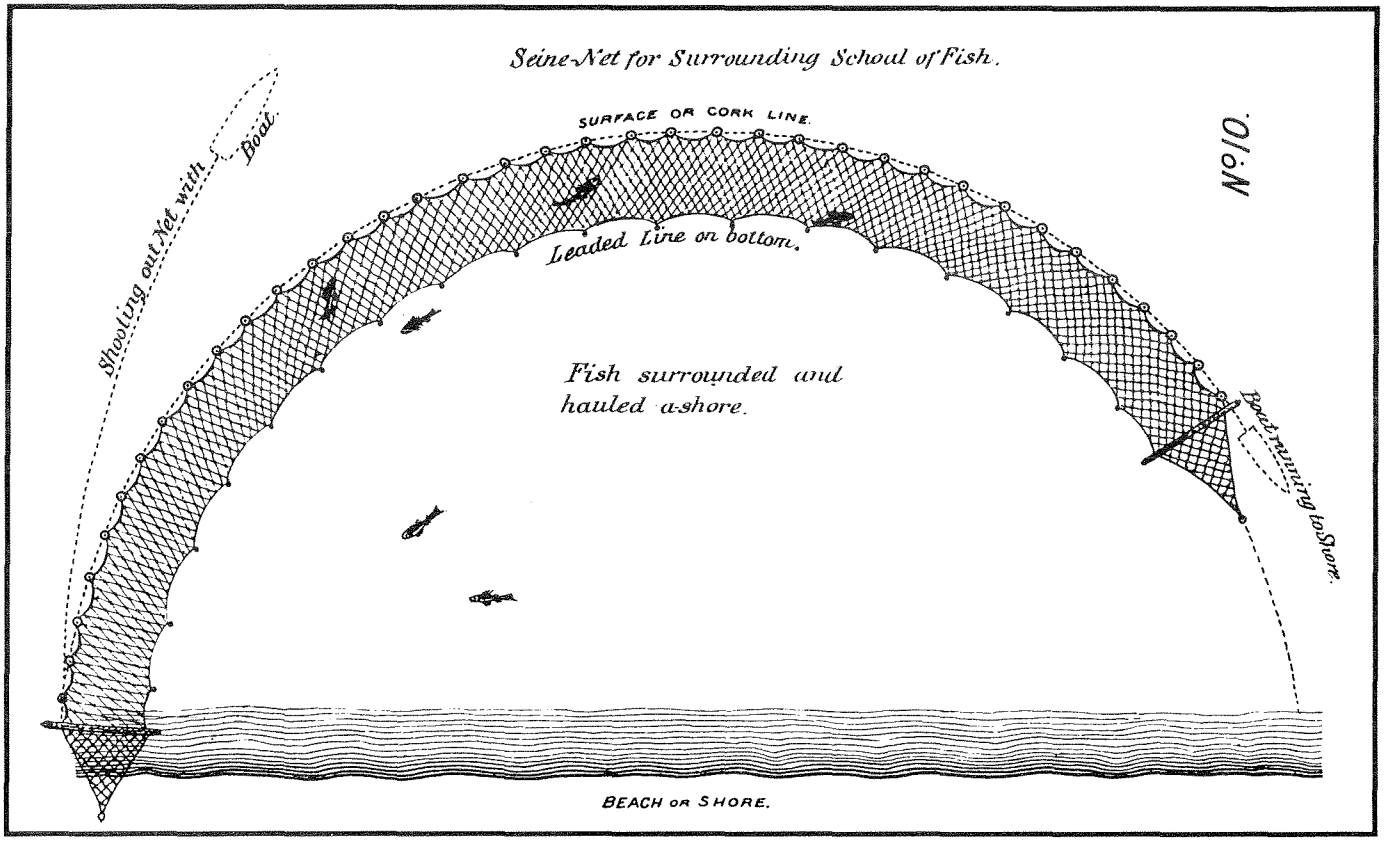
Annual reports of the Department were full of worries. For example, the Maritimes shad fishery had greatly declined. (Today scientists attribute much of the decline to obstructions and pollution in the rivers of the United States, where the shad migrated.) The inshore fishery at Grand Manan, N.B. had deteriorated; dogfish got part of the blame. The oyster fishery was a source of scandalized complaints, always and forever in reports of the period.

The closer to the shore and rivers, the worse that overfishing appeared. For river species, mill-dams and sawdust remained a problem. After 1864, pulp and paper mills began to spread in Canada. Whitcher in the 1870's noted the poor enforcement of laws affecting mill-offals. "The general enforcement of these statutes is rendered almost impossible by the persistent indifference and active antagonism of the manufacturing interest." In some instances, American mills complicated the picture. The Annual Report of 1891 noted that on the St. John River, Maine had ten mills to Canada's one. The Dominion government was pressing the state of Maine on the matter. Experiments began to assess the effects of pulp mills on the Miramichi River in New Brunswick, and elsewhere.

Whitcher had written in 1874 that "the Department has always avoided placing any restrictions on the pursuit of the deep-sea fisheries. At the same time it may be necessary to regulate participation in them by such means as shall obviate collisons and mutual hindrance." Thus, rather than abolishing cod seines on the Labrador coast, one should separate beach seines from the hook and line boats.

In the 1880-1910 period, however, conservation regulation gradually spread from shores and rivers to at least some sea fisheries.

The conservation-mindedness of the Department showed when fishery inspectors from across the country met in Ottawa in 1891. Apart from their recommendations to the Royal Commission then studying



Beach or drag seine, from the 1890 Annual Report.

B.C. fisheries, they expressed these views:

-purse seines should be banned;

-spear fishing should be banned;

-the lobster fishery needed closed areas;

-gillnets were just as dangerous as pound nets (then a subject of horror);

-there should be new close times for shad, trout, and other fisheries;

-there should be a seasonal closure (1 June - 1 September) of mackerel netting during the day;

-there should be no trawls (i.e. longlines) or bultows during the night on bays within two miles of shore;

-there should in some fisheries, e.g. the herring spawning grounds at Grand Manan, N.B., be spawning "sanctuaries";

-fishermen's buoys should be marked.

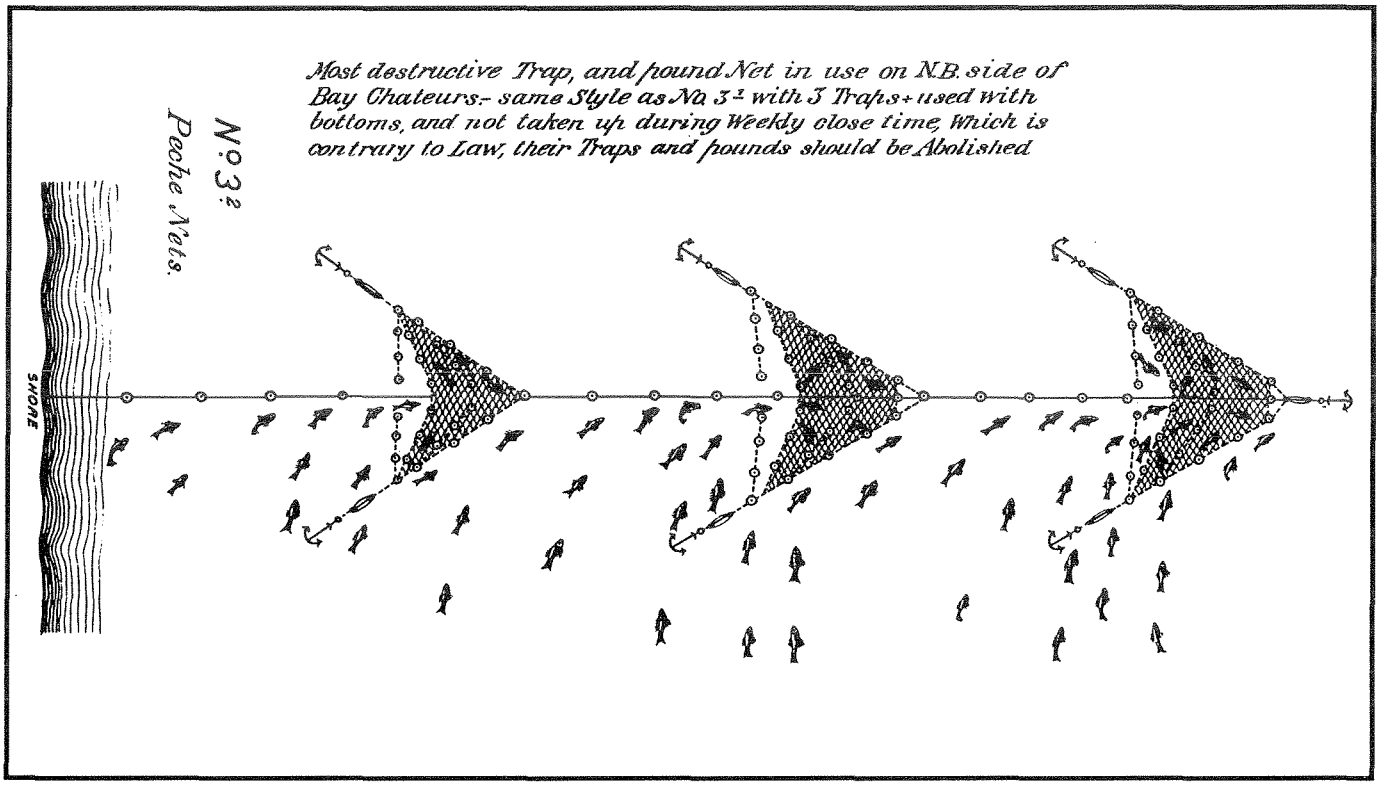
Most of these suggestions became regulations. Rule-making continued apace. For example, in 1894, the ban on rockets and explosives in certain fisheries got extended to cover all species.

Statistics were still poor. Abundance was declining by an unclear amount. In the mid-20th century, biologists sometimes scoffed at old tales of fish so thick "you could walk across the rivers". Yet some of the old reports by observers did show prodigious amounts of fish, sometimes of enormous size, such as the 1,000-pound sturgeon that a B.C. Indian caught in 1880. The widespread complaints suggest that some inshore and river fisheries were indeed dropping sharply.

One sign of the times was the gradual disappearance of beach seines, which depend on fish coming right to the shore. The Department itself placed beach seines under strict regulation in many areas, in an attempt to conserve what fish remained near the beach. Rules were specific, as in a regulation requiring that anyone using a beach seine at Peggy's Cove, N.S., had to live within 5 miles of the village.

In response to fishery declines, from 1890 to about 1920 the Department set up dozens of Royal Commissions. There were at least nine on B.C. fisheries alone. A handful of experts -at least such experts as were available at the time -would talk to people in the fishery concerned, and draw up regulations. The Royal Commissions of this period set the general shape of fisheries management that lasted to the 1960's.

This semi-grassroots approach had its strengths then as today. At commission hearings, local people get their say. If positions have hardened between the



The use of trap and pound nets caused great alarm and new restrictions in fresh-water fisheries. This was one of many illustrated in the 1890 Annual Report.

industry and bureaucracy, the commissioners can often override set attitudes to bring in a new approach.

But this approach also opens the possibility of a hodge-podge of locally-suggested regulations. This was even more the case at the turn of the century, when real fisheries knowledge was still lacking. Statistics were poor, many fisheries were still new, and the experience of many people in the fishing industry was limited. Fishermen and processors advanced many reasons for depletion; and often, each believed they had the sole answer. Prince noted in 1898 that experienced fishermen in the Bay of Fundy had advanced 16 reasons for fluctuations in the herring industry.

Everywhere and always, fishermen tended to associate depletion with rival types of gear. For example, in Prince's time, Bay of Fundy gillnet fishermen blamed weirs for overfishing herring. Among other fishery villains cited in the 1890's: longlines dropped dead fish to rot and destroy grounds; purse seines had been harmful; the pound net was deadly; and so on.

Prince also had an eye for basic matters. He wrote in 1898 that when the Newfoundland bank fisheries declined from 330 vessels in 1889 to 58 in 1894, great alarm followed, and various parties advanced 59 separate reasons. The real cause was Newfoundland's backwardness in fishing methods and markets.

But Prince like the others, was alarmed about depletion. He noted in 1898 that overfishing had damaged shad, lobsters, oysters, menhaden, and the Great Lakes in general.

"FISH CULTURE" AT ITS PEAK

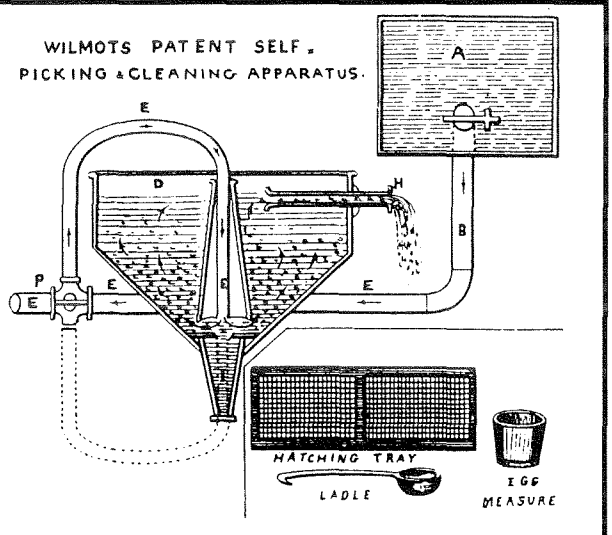
While passing regulations to conserve stocks, the Department also tried to create new fish. Samuel Wilmot's early experiments had gotten wide attention as a means to preserve and increase Great Lakes salmon. Whitcher and the Department had seized on the idea. By the 1890's, hatchery hypnosis prevailed on the Pacific and across Canada. Dozens of hatcheries dotted coastal and inland waters.

Besides salmon, they produced shad, whitefish, pickerel, trout, and other species. Canada's 1891 lobster hatchery at Bayview, New Brunswick on the Northumberland Strait followed an earlier lobster hatchery at Newfoundland, where hatcheries were also popular. That colony set up a cod hatchery in Conception Bay, at the town of Dildo, in futile hopes of generation.

Little evaluation of hatcheries took place. Fish culturists assumed that if they were producing great numbers of fry, it must be a help. Americans were doing the same thing. Spencer Baird, the renowned U.S. Commissioner of Fish and Fisheries, for years had the survey vessel ***Fish Hawk*** distribute millions of fry of shad, lobster and other species at sea. Acclaim was widespread; and meanwhile, research languished.

Year after year Samuel Wilmot, in charge of fish culture for the Dominion, reported on the great progress that hatcheries were making. British Columbia got its first salmon hatchery, on the Fraser, in 1884.

5. Taking Ova from Fish and Impregnating them.



6. Hatching Apparatus.

The 1878 Annual Report carried diagrams of the Dominion Hatchery at Newcastle, Ontario, Wilmot's original site.

By that time, Quebec had four hatcheries, Ontario, New Brunswick and Nova Scotia each had two; and Prince Edward Island had one.

By 1910, British Columbia had eight hatcheries, Quebec eight, Ontario five, New Brunswick five, Nova Scotia five, and P.E.I. three. Hatcheries were now planting more than a million fry per year. But some officials were beginning to doubt their value. One B.C. fisheries inspector noted that for enhancing salmon, clearing streams was 100 per cent better. In Newfoundland as well, doubts about hatcheries were cropping up.

FISH TRANSPLANTS BECOME POPULAR

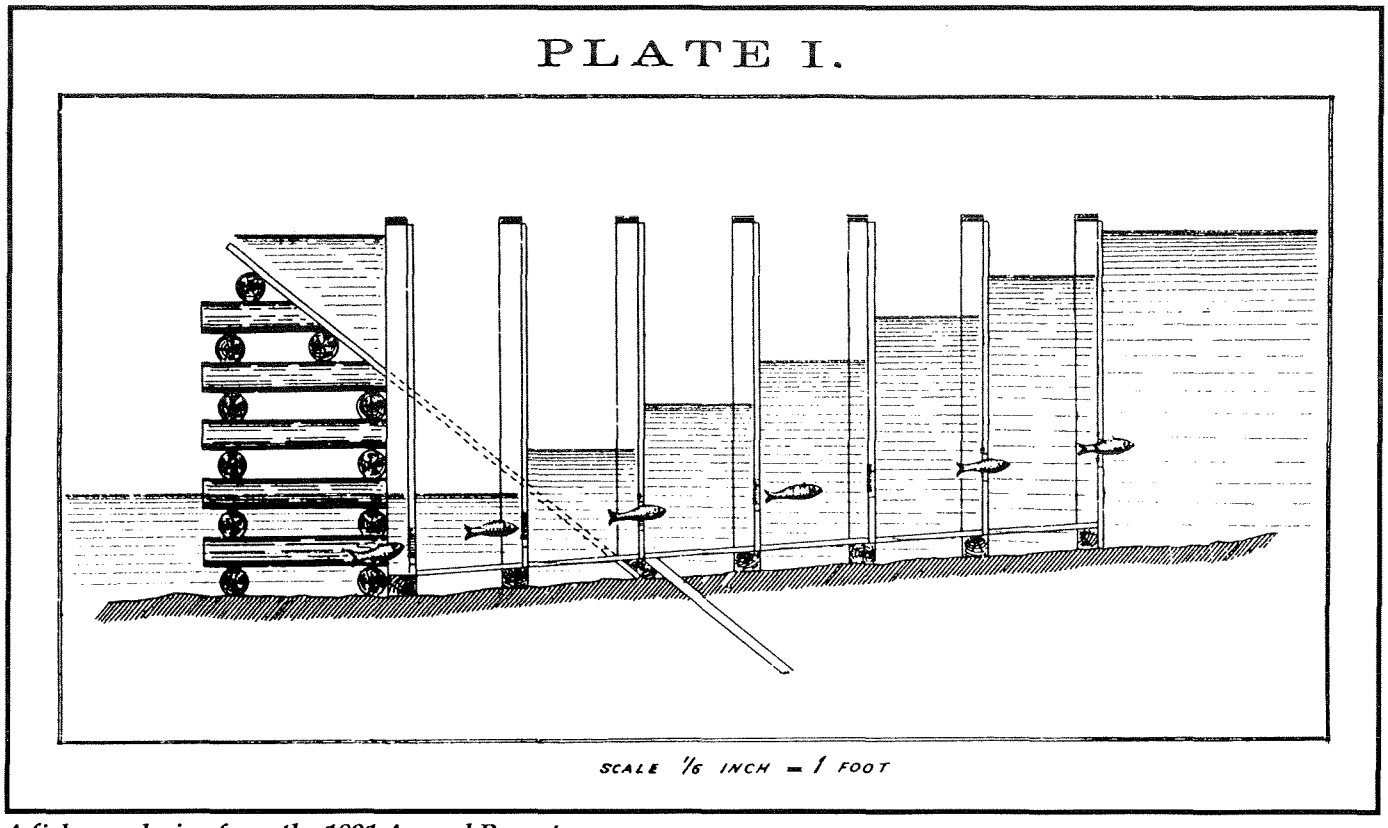
Like hatcheries, the transplanting of fish seemed to allow the creation of new abundance from almost nothing.

Fishery Inspector Thomas Mowat tried to transplant lobsters to British Columbia in the 1880's. New attempts took place in 1896 and 1905. Other experiments in the 1890's and early in the 20th century put whitefish into B.C. lakes and Atlantic salmon and oysters into B.C. waters, with some survival in the latter case.

The fisheries service experimented with keeping egg-bearing female lobsters in pounds, returning them to sea in the closed season. It also tried transplanting black bass to B.C., and western Ontario. Prince noted in 1898 that more scientific knowledge was needed; lots of amateurs were now transplanting fish, and could do more harm than good.

Carp soon provided a case in point. In 1896, some carp escaped from a stocked pond into the Great Lakes system; and some may have gotten there from other sources as well. They spread extensively in the Great Lakes and Manitoba, and are still spreading. W.B. Scott and E.A. Crossman, in their superb reference book Freshwater Fishes of Canada, noted in the 1970's that "They are probably increasing in numbers. Carp are considered detrimental to native fish populations because they increase the turbidity of the water and uproot and destroy submerged aquatic vegetation that is essential for the survival of native species, since such growth provides cover, food, and sometimes spawning sites. They also adversely affect duck populations by the destruction of rooted aquatic plants in marshes, and control measures, such as fencing, have been applied in western Canada."

A "coarse fish", carp provide only a trifling commercial fishery. Mainly they are undesirable. Control measures have had little success. In short: a chance introduction of a new species brought a long struggle to undo the damage.



A fishway design from the 1891 Annual Report.

MORE FISHWAYS

Along with hatcheries and transplants, fishways drew new attention in the period. They were already well known; Whitcher in 1874 referred to construction of nearly 30 fishways. By 1885, there were 43 in the Maritimes.They let river species reach spawning grounds lost to mill-dams or other obstructions, and colonize new areas. Fishery officers showed great interest in them, often coming up with new designs.

This quiet, down-to-earth work has taken place ever since, with fishery officers and department engineers such as Harry Lynch putting many fishways in place in the first half of the 20th century.

TRANSPORT SUBSIDIES FOR FRESH FISH

Besides regulation and resource enhancement, the department was now looking more towards development.

The American development of the fresh-fish fishery was obvious. And Whitcher in the early 1870's had noted the increase in the Canadian fresh trade. Mixtures of salt and ice kept the fish cool in boxes and storehouses. Salmon got early attention, along with inland species, and then groundfish. By 1885, Digby, Yarmouth, and Lunenburg were all producing some fresh fish in winter, when it would keep easier. Train transport aided the fledgling industry.

But Maritimers still stuck mostly to salt fish. To encourage the fresh trade, in 1907 the Canadian government decided to subsidize transport of fresh fish to market, from both the east and west coasts. The one-third subsidy on shipments of less than carload lots, by express, did appear to help the fresh-fish trade. It was the first major attempt to aid marketing.

NEW FEDERAL INSPECTION ACT

In the 1870's Whitcher had tried and failed to get compulsory inspection of fish products. Under his scheme, fishery officers were to inspect fish as well as carry out their other duties, and introduce "a light scale of fees" for inspection, which would supplement "their nominal pay in the protective service." Although Parliament passed a general Inspection Act, the government never put Whitcher's plan into full force.

Like the licensing of river-bank fisheries, the inspection of fish products raises jurisdictional questions, because of the provinces' close relation to busi-

ness activities. But the federal government in the 1890's still asserted its control over plant licences, and showed no hesitation in passing a new Inspection Act.

A report had pointed out problems with herring curing. In 1890, Deputy Minister Tilton wrote a long justification, with many quotes from interested parties, on the need of an inspection act. The same year saw the new law come into force.

The Inspection Act remained voluntary. Producers could, if they wished, request the department to view their product. It was thought that shippers would want to get the government stamp of approval on their barrels, as an aid to marketing. This supposed self-interest turned out to be a weak lever; many shippers continued exporting fish approved only by themselves.

ORGANIZING BAIT - AND FISHERMEN

If preserving barrelled and pickled fish for consumers had its problems, so did preserving bait for fishermen. Now the Department tried an ingenious method to provide bait for fishermen, and to help them organize.

Around 1891 the department began issuing bait bulletins, saying where fresh bait might be had, and giving out information on constructing freezers that used a brine of salt and ice. Prince's Royal Commission on the lobster fishery in 1898 led to a further step. The Department got legislation that let it provide bait freezers, with bonus money for associations that maintained them. By 1908, 45 such freezers had come into operation.

Before Confederation, New Brunswick and to some degree Nova Scotia had tried to encourage fishermen or the industry at large to organize themselves and work together. The bait freezer experiment was the first notable attempt by the Department after Confederation. There were 62 bait-freezers by 1909.

Parliament also in 1907 passed an act authorizing payment of 30 percent of the cost of building cold storage warehouses. But frozen-fish was still little known, and the program seems to have attracted little attention. The bait-freezer program itself faded away in future years.

REGROWTH OF THE PATROL FLEET

The fisheries patrol fleet, entangled with foreign policy, in the 1880-1910 period became the nucleus of the Canadian navy.

The patrol fleet had dwindled with the Treaty of Washington, to only one vessel in 1880, and that for the Gulf and Lower St. Lawrence, the sailing vessel *La Canadienne*. After the original *La Canadienne* went out of service, a 154-foot cruiser took over in 1881, under William Wakeham.

After fisheries reciprocity ended in 1885, in the words of the 1886 Annual Report, "no other course was then left the Canadian government but to adopt measures for the protection of its rights...." Fisheries, at the time a separate department, added eight other vessels, bringing the fleet to nine.

Canada reimposed strict enforcement against American fishing vessels. A large U.S. fleet still came north. Although they no longer had privileges inside three miles, nothing stopped them fishing on the Treaty Shore at the Magdalens, part of Newfoundland, the Quebec North Shore, and Labrador. Elsewhere, they could fish just outside the three-mile zone; and some would try to slip inside it.

By the terms of the 1818 Convention, Americans could enter Canadian waters only for shelter, wood, and water. There would be no fishing inside the zone, no transshipping crews or fish, and no buying of bait. Minister George Foster told his fishery patrols that they had "full authority." While displaying a conciliatory approach, "you will accost every foreign fishing vessel". In 1886 the protection service made some 700 boardings, and in 1887, made more than 1,300 boardings. The Canadians seized several U.S. vessels.

Americans raised a hue and cry. Politicians took up the cause against Canadian "brutality" and "inhumanity". They complained that the Canadian government had even penalized its own fishermen for supplying U.S. vessels in waters outside the three-mile limit. What if American fishermen wanted to enter Canadian ports just to buy a newspaper? What if they wanted to bury their dead?

Although American protests about lost port privileges sounded exaggerated, still some Canadian officers may have overdone the enforcement. After a U.S. vessel bought food in Prince Edward Island, Canadian patrol officers reportedly gave an emetic to an American sailor, to make him disgorge his illegal meal.

The U.S. retaliated with a "Non-Intercourse Act", allowing the government to bar Canadian vessels from U.S. ports and to bar Canadian fish or anything else from U.S. markets.

Canadians had at least some sympathy in the U.S. The Boston Fish Bureau, apparently representing importers, in 1886, asked for renewed reciprocity. The Bureau said that the complaints by U.S. vessel owners that Canadians were hurting them were a pretence; it was Canadians who manned the U.S. vessels anyway.

The question of Canadians in the U.S. fleet came up several times. Some said that U.S. operators brought in Canadian fishermen because they could get them at lower wages. But it appears that Americans

manned most of the fleet. An 1887 report said that of 14,240 fishermen in the U.S. North Atlantic fleet, 78 percent were American.

U.S. and Canadian negotiators tried in 1888 to replace the Treaty of Washington with a modified arrangement. Massachusetts protests defeated it. But that same year, the two sides and Great Britain arrived at a "modus vivendi" (literally "way of living"). Though barred from fishing within three miles (except on the Treaty shore), American vessels could come into Canadian or Newfoundland ports for supplies, repairs, or transshipment of fish or crews, on payment of a yearly licence fee.

The modus vivendi came into force pending negotiations for a new treaty. But the two sides never concluded the new treaty. The modus vivendi of paying license fees for port privileges was to last until the 1920's.

The modus vivendi calmed the seas. By 1890 there was only one seizure, of the schooner ***Davy Crockett,*** for fishing from dories within the three-mile limit in the Gulf.

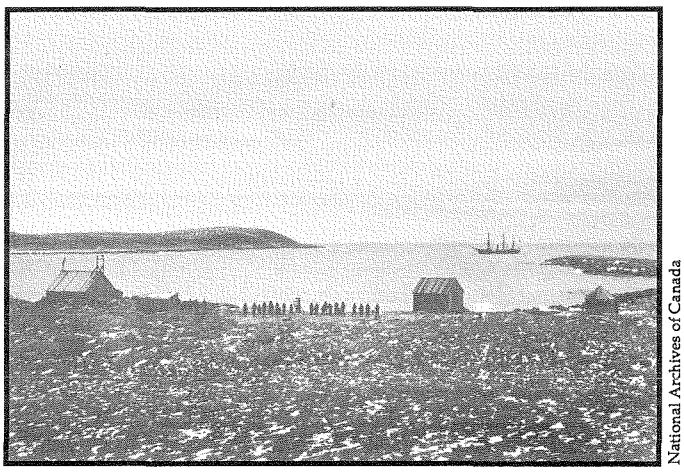
Despite its port privileges, the U.S. fleet kept more and more to waters close to the U.S. At LaHave Bank, off southwest Nova Scotia, New Englanders developed an important fishery for fresh haddock. In general, however, the New England fishery on the Grand Banks and the banks of the Maritimes declined from 1880's levels of 300 vessels and up into the 1880's to only 60 vessels in 1910.

GORDON OF THE PATROL SERVICE

The resurgence of the patrol fleet involved the remarkable Andrew Robertson Gordon.The Canadian government had sent expeditions north in 1884, 1885, and 1886, to determine a good route through Hudson Bay to western Canada. Commanding the expeditions was Gordon, formerly a lieutenant in the Royal Navy, now an officer of the fisheries patrol service. For the first expedition Gordon chartered a sealing steamer from Newfoundland, the Neptune. After scouting around, Gordon recommended Churchill, a post of the Hudson's Bay Company, as a railway terminal (which it became decades later, in 1931).

Gordon continued in the patrol service, and became Commander of the Fishery Protection Fleet from 1891 until his death in 1893. His remarkable reports displayed a keen intelligence. Some of his ideas came into play in his own time, some only decades later.

In 1889, Gordon reported on the practicalities of setting up a tide and current survey. His work helped



National Archives of Canada

The Hudson's Bay Expedition observation station at South Stupart's Bay, Quebec, in 1884. The SS Neptune is anchored offshore.

bring about annual tide tables and the 1893 creation of the Tidal and Current Service. Following this and other early efforts, notably the Georgian Bay survey and subsequent work, the Canadian Hydrographic Service started officially in 1904.

Gordon recommended after his third Hudson Bay expedition that the government begin issuing licenses for foreign whalers. He intimated his objections that only the Hudson's Bay Company and American fishermen should be getting the dollars from northern resources.

In his report to the Department, Gordon also recommended renting out salmon rivers. This of course harked back to the ideas of Whitcher and the thinking embodied in the Fisheries Act.

As for salmon conservation, Gordon took what we might now call an "ecosystem approach". He wrote that New England's destruction of her anadromous resources was now complete. But "you cannot injure or destroy one fishery without affecting another." The shore fed the sea, said Gordon, but New England had already destroyed its shores, and Canada was starting to do so. Wood cutting was making rivers unstable. The rivers needed timber around them, needed fishways, and needed the absence of pollution. There should be no more taking of anadromous fish for bait; rather, there should be ice houses and refrigerators to preserve herring and other sea species. Soon after, the Department started its bait-freezer program.

Gordon like others quarrelled with the use of purse seines, giving reasons in the Annual Report of 1890 why they should be banned. A ban followed in 1891.

The patrol captain suggested a fisheries Loan

Board, to help Canadians compete with the subsidized French and the highly-capitalized Americans. Half a century later, provincial governments began setting up such loan boards.

Gordon recommended recording catches on statistical charts, ruled off into squares. Only in the 1930's and 1940's did the Fisheries Research Board catch up with this idea.

Finally, Gordon successfully pushed to create a Fisheries Intelligence Bureau, which started up in 1889 and lasted for many years. The Bureau collected information and reported to the industry on the location of fish schools off the coast, supplies of bait, and so on.

REQUESTS FOR U.S. CO-OPERATION FAIL

Although the modus vivendi of 1888 brought fisheries peace with the United States, still there were problems. The United States in the 1890's increased its general tariffs, hurting the Canadian economy. The U.S. takeover of Puerto Rico in 1898 cost the Canadian cod trade a duty-free market.

Meanwhile, American fishing and pollution pressure on boundary waters kept increasing. On the Great Lakes, American trap-nets became more and more common in the 1890's. In 1891, the Department's Annual Report complained of U.S. over-fishing, and remarked on the superiority of Canadian regulations. A prophetic sentence noted that the jurisdiction of individual states over U.S. fisheries made it difficult to get any regulations.

The Canadians in the early 1890's wanted U.S. action to reduce pollution of the upper St. John River; to restrict pound-nets in the Great Lakes (where Canadian officials said their own conservation measures let Canadian fishermen catch as much as the Americans with only one-quarter as many nets); to control the fishery for Fraser River salmon; and to control purse-seining for mackerel.

In 1892, a Canada-U.S. conference on fisheries took place, with U.S. delegates expressing admiration for Canadian regulations. A Joint Commission in 1893 began examining fisheries and pollution in boundary waters. In 1897, the Commission published an extensive report on "the Preservation of the fisheries in waters contiguous to Canada and the U.S.," and suggested corrective measures. The Canadian Department hailed this report. The U.S. Congress refused to approve it.

It was the start of many similar attempts. For example, in 1908 a proposed fishery treaty, with 62 regulations, went nowhere. Over and over in the late 19th and early 20th centuries, the two sides with great difficulty negotiated arrangements, only to have Congress frustrate all the work. Any such conservation treaty would injure some local concern or other. There being no strong national fisheries agency, local interests usually prevailed with American politicians. In mutual fisheries management by Canada and the U.S., there have been some notable successes, but many more forgotten failures.

In the 1880-1910 period,Canada and the U.S. made more progress with water than with fish. In 1909, the Boundary Waters treaty with the United States set up the International Joint Commission, with three commissioners from each side, to deal with boundary waters' protection, apportionment, and development (for example, through hydro power). The IJC began work in 1912. It has reported and recommended on dozens of issues, such as diversions of waters. It is generally considered to work well.

Although it is the oldest continuing Canadian-American intergovernmental organization, the IJC has older ancestors: the many joint commissions set up by Britain and the U.S. in the 19th century to settle disputes, including the commission that created the Treaty of Washington.

FISHERIES SERVICE THE NUCLEUS OF THE NAVY

Since Confederation, apart from the increasingly reluctant British Navy, the fisheries patrol service created by Peter Mitchell had been Canada's only armed force defending marine sovereignty. Twice its energetic defence of the three-mile zone edged Canada and the U.S. close to outright hostilities. The patrol service increased American respect for Canada, and increased Canada's own feelings of sovereignty.

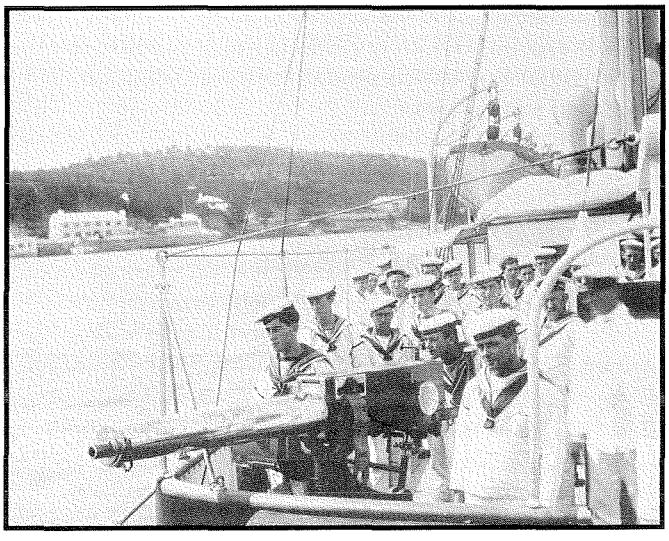
By the turn of the century, Little Englandism had waned. British pride in the Empire was waxing strong, encouraged by Colonial Secretary Joseph Chamberlain. Competing with the French and German empires, the British renewed their interest in sea power. The idea arose that Canada and the other colonies should give money to keep the Royal Navy supreme at sea.

In Canada, opinions were mixed. The British government, the many imperialists in Canada and the Conservative opposition all wanted Prime Minister Laurier to give money to the Royal Navy. Laurier instead chose to introduce the Naval Service Act, establishing Canada's own Royal Canadian Navy as of 4 May 1910.

How did the idea of a Canadian Navy win the day? A key element was the already-existing fisheries patrol service, the nucleus of the navy.

In 1886 the protection fleet had expanded from *La Canadienne* alone to nine vessels, as the government pressed existing vessels into service. The fleet gained force in the 1890's as the government built and bought five armed vessels, all over 100 feet in length. In 1900 the Protection Service still had nine vessels, but they were better ones.

After a 1902 colonial conference on Defence, the fisheries protection service took on more naval trappings. That same year, Marine and Fisheries became responsible for Arctic sovereignty. In 1904, the department took on three more armed vessels, including the 176-foot *Vigilant*, "the first modern warship to be built in Canada", and the 200-foot steel *Canada*. With 73 officers and crew, the *Canada* operated as a man-of-war and began training a naval militia. By 1909-10, the fleet had 13 vessels and 255 men. Some of the other cruisers were small warships with ram bows and cannons.



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Deck scene showing the gun and crew of the Fisheries Protection Service cruiser DGS Canada off Bermuda.

In 1907, at another Colonial conference on Defence, Marine and Fisheries Minister Brodeur discouraged the idea of Canadian contributions to the imperial navy. He told British and colonial representatives that Canada had already taken a reasonable share of naval expenditures through the Fisheries Protection Service and other works.

And it was Brodeur, the Minister of Marine and Fisheries, who later introduced the Canadian naval bill in Parliament. On 3 June 1910, Brodeur became the first Minister of the Naval Service, while retaining Marine and Fisheries. Deputy Minister George J. Desbarats also did double duty until, in 1911, Alexander Johnston replaced him at Marine and Fisheries. Charles E. Kingsmill, the Department's Director of the Marine Service, became Director of the Navy.

If the fisheries fleet was the mother of the Navy, the new fleet had a troubled birth. French-Canadian nationalists allied with the federal Conservatives in protesting the new Navy. The whole affair helped defeat Laurier's Liberal government in 1911. The Navy survived the Borden government's lack of sympathy, but entered World War I with only two warships.

FISHERIES AND THE ARCTIC

The Department of Marine and Fisheries also helped establish Canadian sovereignty in the Arctic.

Foreigners had long been in the Arctic. On the Pacific, American whalers penetrated the Bering Sea by the 1830's, hunting migrating whales; and from 1889 to about 1914, they operated in the Beaufort Sea.

On the Atlantic, American whalers had operated off the British colonies in a sporadic manner. European whalers began whaling on the eastern side of Davis Strait in the 1600's. With the Industrial Revolution, whaling speeded up. By the period 1820-1840, there was a lot of activity in Davis Strait. There would some years be nearly a hundred vessels, largely English and Scottish, taking more than a thousand whales. Whaling then commenced in Canada's eastern Arctic, with some whalers overwintering on Baffin Island after 1850.

As steam engines became common after 1850 and whaling technology improved, Arctic grounds that foreign whalers had formerly ignored became profitable. Whalers gained efficiency in the 1850's from the shoulder gun, firing timed charges, and by 1870, the bow-mounted harpoon gun, firing explosive missiles. Although kerosene and petroleum had now replaced whale oil lamps, the animals continued to provide lubricant oil, baleen for corset stays, and other material uses.

In the Arctic, the presence of American whalers in particular added to doubts about Canada's jurisdiction. Observers called for more Canadian activity in the north.

In 1860, New England whalers opened the northwest section of Hudson Bay. In 1874, the United States asked permission for whaling and mining at Baffin Island. The perturbation over this request helped bring about Britain's 1880 transfer of her Arctic claims of sovereignty to Canada.

WAKEHAM AND BERNIER

After Gordon's cruises to Hudson Bay in the 1880's, the Canadian government undertook several Arctic expe-

Advertisement from marine and fisheries history book by E.J. Chambers, The Canada Marine, Toronto ,1905. Note the Mounties in the centre of the photo.

ditions at the turn of the century. These included work in Hudson Bay and Labrador by the *Diana* in 1897, under W. Wakeham of the Gulf of St. Lawrence fisheries patrol, who had been captain of *La Canadienne*. On Cumberland Sound, at a Scottish whalers' depot, Wakeham hoisted the Union Jack and proclaimed Baffin's Land and everything adjacent as being now and always under British sovereignty.

Besides Norwegian and American explorers active in the Arctic, foreign whalers were still there at the turn of the century. In 1902, Marine and Fisheries became responsible for Arctic sovereignty. In 1903, the Laurier government began sending North-West Mounted Police to Herschel Island on the Yukon coast and to Hudson Bay. They went to show the flag and keep law and order, sometimes a problem with drunken American whalers recruited by crimps. The *Neptune*, the same vessel used by Captain Gordon in the 1880's, landed the Mounties in Hudson Bay.

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Fishing codfish on board the Diana at Port Burwell, N.W.T., 1905. The CGS Arctic is in the background.

In 1906, Canada amended the Fisheries Act to proclaim Hudson Bay wholly territorial waters of Canada. Between 1904 and 1911, the government mounted several cruises by the vessel *Arctic*, under the mariner Joseph-Elzear Bernier. (As a young man, Bernier had served under Pierre Fortin on *La Canadienne*.) Conducting explorations and collecting customs dues, Capt. Bernier reported back to the Minister of Marine and Fisheries as a Fishery Officer.

Bernier reported after his 1906-07 cruise that the number of American and Scottish whalers and Baffin and Hudson Bay, as high as 600-630 in earlier years, had declined to about 50, which during his visit were finding no whales.

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Captain Joseph-Elzéar Bernier (centre) and his crew at Winter Harbour, N.W.T., on Melville Island. (Photo taken July 1, 1909.)

Bernier proclaimed sovereignty at various sites, and in 1909 unveiled a plaque on Melville Island officially claiming the Arctic islands for Canada. In 1910, he began issuing licences to the foreign whalers, thus affirming Canadian sovereignty. By the end of the decade Canada's claim to the Arctic lands appeared fairly secure. Further developments in the 1920's nailed it down.

Meanwhile, the bowhead whales in the Arctic were dwindling, and other materials were replacing baleen. By World War I, Arctic whaling had all but ceased.

FISHERIES REGULATION SLOW FOR GROUNDFISH

Throughout the period of Arctic adventures and patrol fleet growth, the great bulk of work was always the day to day control of fisheries. And regulations almost always began in the rivers and the shore fisheries, moving slowly out as problems spread.

For the greatest fishery of all, groundfish, the fisheries service made few regulations. There were no royal committees on groundfish. The enormous, pre-existing saltfish trade simply underlay everything else. The main regulations called for spacing between gear, for example, no seining cod within half a mile of where hook and line fishing was going on. And cod seines had to have at least 4-inch mesh in the arms, and 3-inch in the bottom of the seine.

In 1891, the Department subsidized one Cathcart Thompson of Halifax, to experiment with drying fish by absorbent pads. This marked the beginning of a long series of attempts to find a way to dry cod without the sun, thus to overcome the rain and fog that often interfered with outdoor drying. In 1905, the fisheries service put up a cod-drying plant at Souris, P.E.I., and leased it out in 1909.

THE COMING OF THE COD TRAP

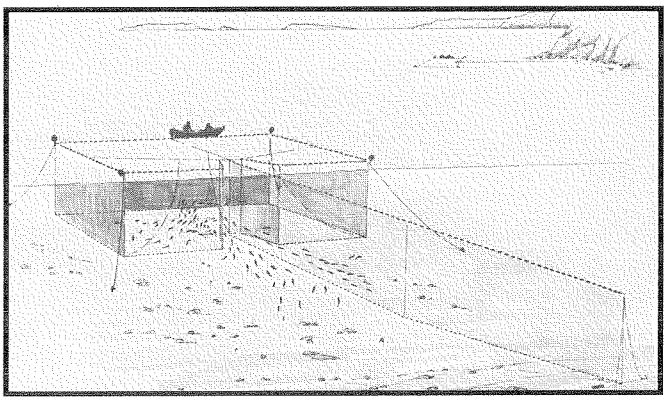
Although earlier decades had seen precursors, the Newfoundland cod trap came into being only around 1871. It was the work of W.H. Whiteley, a planter at Bonne Esperance on the Lower North Shore of Quebec. Whiteley was also, from 1867 to 1897, Canada's Fishery Overseer for the Bonne Esperance Division (about 60 miles of coast).

In his 1876 license application to the Canadian authorities, Whiteley called his new advice a "pound net". In the cod trap, as in many other fish traps, a leader net running out from shore diverts the fish into the mouth of an enclosure. The cod trap, in one description, "resembles a room with twine walls, a floor and a door."

The cod trap spread rapidly, to the point that Whiteley himself began to consider it a menace. On Quebec's Labrador coast, shore fishermen soon were complaining complained about schooners using traps. In 1894, Whiteley recommended regulations to control the estimated 400 vessels on the coast, mostly from Newfoundland.

New cod fishing regulations for the Gulf of St. Lawrence required that each trap have a licence. Residents got prior claim to location. Cod traps were not to interfere with salmon fishing. There must be at least 250 yards between traps, and only one trap per vessel. Each cod leader had to extend from shore. A minimum mesh size applied, and a fee of 50 cents for each fathom of leader. Bultows or gillnets were prohibited within three miles of any island; and jiggers were prohibited.

This was a mixture of conservation, economic, and social regulation. In years to come, other new



DFO / Walter Scott

A diagram of a modern cod trap in Newfoundland. After the fish follow the "leader" into the trap, fishermen then close the doors and bring the trap to the surface, hauling it across the boat. The fish are concentrated in one corner of the trap and collected with a dip net. One cod trap vessel may tend up to four or five traps, although three or four are more common.

techniques would bring a similar response.

PELAGIC FISHERIES: SALMON

Maritimes salmon were from the mid-19th century a perennial concern. By late in the century, "American capitalists" were entering the sport fishery in strength. Anglers soon learned how to lobby. The Department's Annual Report of 1891 noted the Restigouche salmon club's various grievances.

By 1910 the fisheries service had regulated salmon every which way, including closed seasons for net and fly fishing, size limits (three pounds), mesh size limits, spacing of nets, and no fishing within 200 yards of spawning streams. There were also specific regulations by province, including in New Brunswick a net licence fee of 3 cents per fathom.

BIRTH OF THE SARDINE INDUSTRY

Salmon were an old worry. Mackerel and herring, however, were posing new problems, associated with new technology: canning and purse seines.

By the 1890's, Americans chiefly in New England had applied the canning process with mixed success to many species and products: eels, mehaden, smelt, smoked sturgeon, halibut (on the Pacific coast), mackerel, scallops, smoked trout, smoked pike, smoked carp, caviar, finnan haddie, codfish balls, and chowders.

Eastern Maine and southern New Brunswick had herring in abundance, especially small herring, and these especially at Passamaquoddy Bay. There the Maine towns of Eastport and Lubec look across the water at the Canadian islands of Campobello, Deer Island, and Grand Manan.

The idea of using small herring as "sardines" came from Europe, especially France. After an earlier attempt failed, New York business men set up the Eagle Preserved Fish Company at Eastport in 1875. This company and those that followed often used French labels to attract customers. By 1886, 45 sardine plants in eastern Maine employed 4,315 people.

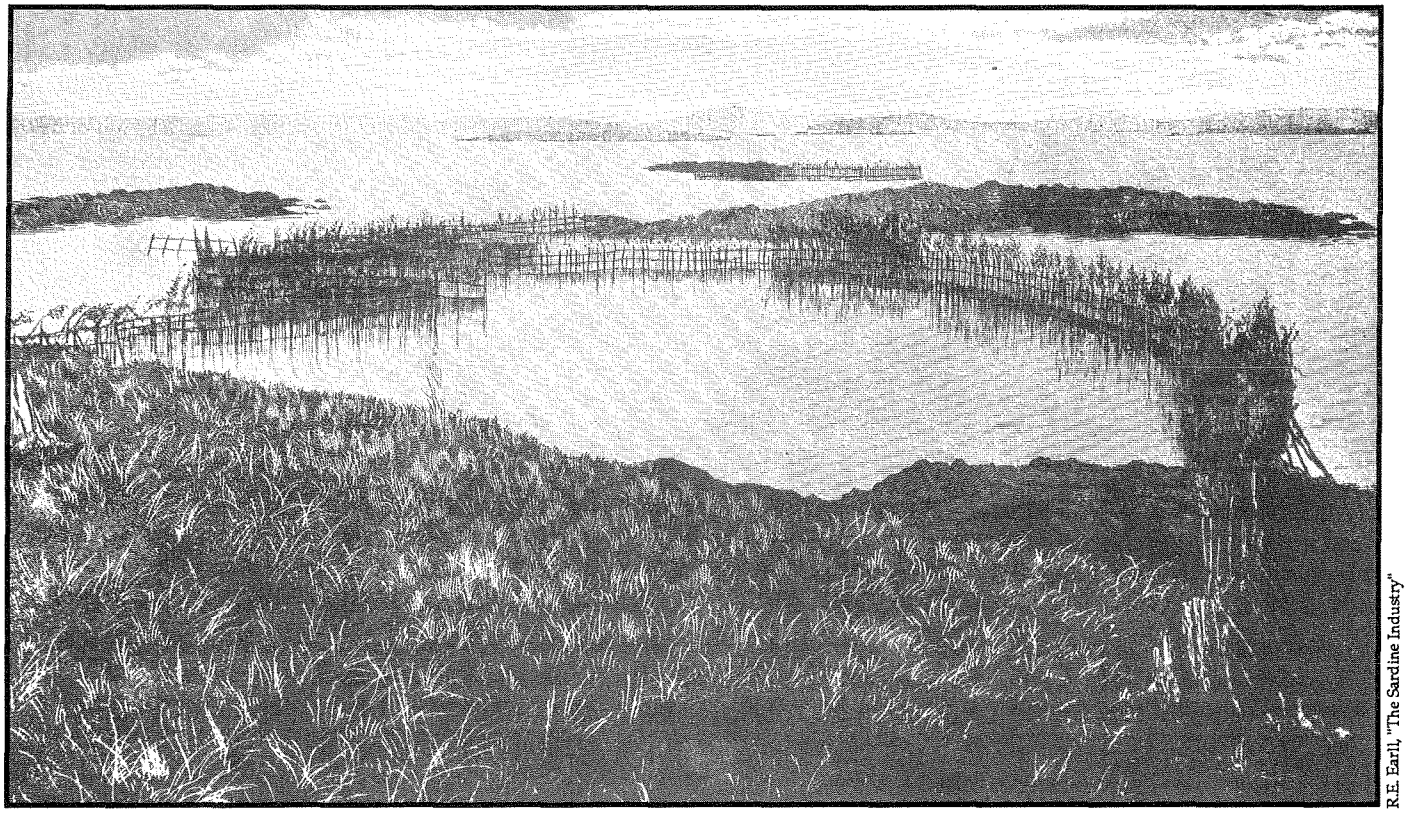
Processing took a lot of work: salting the fish; spreading them on "flakes" (wood or wire frames); drying them outside by sun or inside by artificial heat; frying them in oil or steaming them; making the cans; filling the cans with oil, spices, and so on; soldering the tops on the cans (some men could solder a thousand cans a day); "waterbathing" the cans in boiling water; making a small hole to vent the superheated air from the can; resealing the can with a drop of solder; and cleaning and boxing the cans. Around the turn of the century, factories got machinery to make and seal cans. Sardine processing today is considerably simpler and more mechanized, but still requires individual packing of every fish.

Eastport and Lubec factories got their herring from brush weirs, mostly on the Canadian side. Nova Scotia fishermen had used the brush weir at least from the later 1700's; settlers apparently adopted it from the Indians. Construction seems to have become common around 1820. Then, across the Bay of Fundy, fishermen at Campobello and Lubec began building weirs, which gradually spread throughout the area.

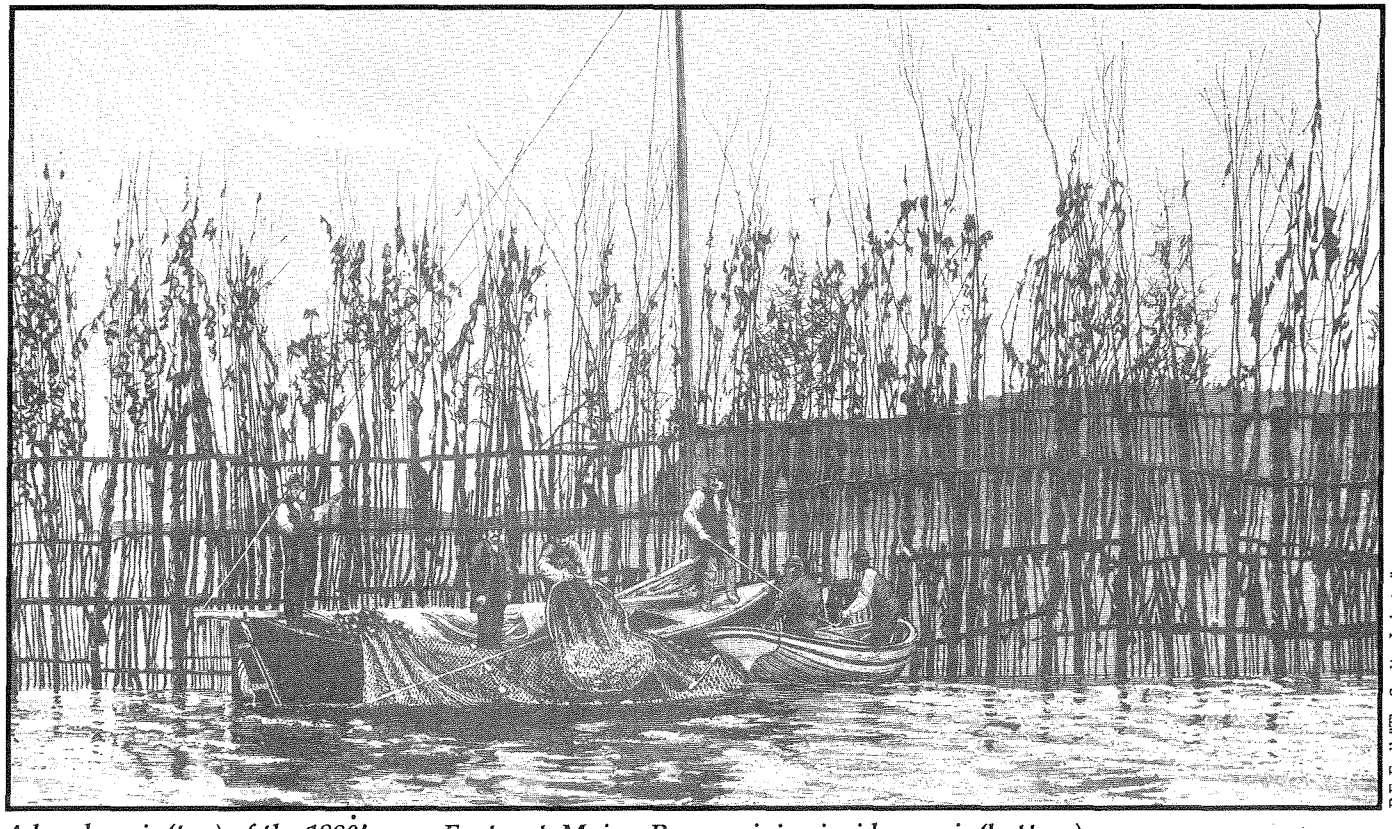
Like the pound net or cod trap, the Bay of Fundy herring weir is an enclosure built near shore. Pursuing food, the fish follow a leader fence into the mouth of the trap. In this case, the trap is a large one. Weirs were originally built entirely of poles and brush. Later they used twine as well.

Weir fishermen took out the fish with seines, either hauling them onto the nearby beach or making a circle inside the weir, with the bottom of the net close to the bottom of the water, and then using dipnets. Small open sailboats, 18-30 feet long, took the herring to the factories. By the 1880's, some plants used steamers to tow the boats in.

The Canadian government soon made weir-builders obtain a licence, for $5. A new weir could be no closer than 600 feet to another, and was not to interfere with the fishing of another. The local fishery officer inspected the location and gave his recommendation to the head inspector for the province, who issued the licence. Once a person got a licence, he received preference, and could keep the licence even if

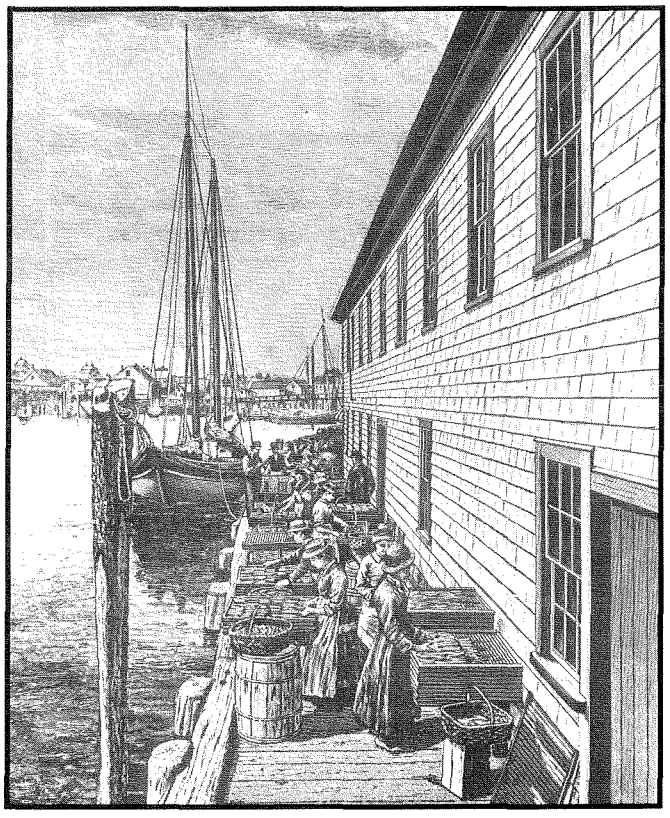


R.E. Earll, "The Sardine Industry"



R.E. Earll, "The Sardine Industry"

A brush weir (top) of the 1880's near Eastport, Maine. Purse-seining inside a weir (bottom).



R.E. Earll, "The Sardine Industry"

R.E. Earll, "The Sardine Industry"

Steam tugs often towed sailing skiffs (top) from weir to factory. Eastport ladies packing sardines (bottom).

he failed to build or maintain his weir. If someone else wanted to take over a licensed but unused site, he had to get a statement from the licence-holder that he had no objection. Some fishermen purchased a number of privileges and sold them to their neighbours.

Though drag-seines (also known as beach seines or haul seines) were common in Newfoundland, the Magdalens, and elsewhere, they came into use on New Brunswick's Fundy shore only after 1880, when weirs were already established. Soon 50 or 60 seining crews, using large boats, were at work. Also in the 1880's, one cannery proprietor introduced the purse-seine to the area, for seining in open water. A small sailboat successfully used a 250 fathom purse-seine.

Weir fishermen protested that because of the inrush of drag-seines, they were losing the benefits of the weir privilege for which they paid. The state of Maine had by this time banned the seining of herring. The Canadian government decided that the weir fishery was an established industry which deserved protection. In August, 1886, the government banned both drag-seines and purse-seines in this fishery. A more general ban on purse-seines was to follow.

By 1893, Passamaquoddy Bay all told had 240 weirs. The number increased in the 20th century, but declined somewhat with the decline in the U.S. sardine trade after World War II. Between 1926 and 1950, the Charlotte County sardine catch fluctuated roughly between 10,000 and 45,000 tonnes, the Maine landings generally a bit lower. In the 1970's, the Canadian side of the Bay of Fundy still had more than 200 weirs.

By the time the sardine industry began in the 1870's, the fishery for larger herring was already sizeable on the Fundy islands, by both weirs and gillnets. The gillnet dominated the important herring fishery at southern Grand Manan. Regulations prevented fishing on the spawning grounds before October 15; but then a fleet of fifty vessels would enter the fishery. For whatever reason, overfishing or disturbance to spawning grounds, this fishery later virtually disappeared.

In the 1880's, Canadians got a small sardine factory going at St. Andrews, near the U.S. border. It was at nearby Black's Harbour, though, that the industry planted its feet firmly. Connors Brothers started up in 1885; and in 1895, the large Connors plant was the only one operating in Canada.

Although later starting than the American factories, the Canadian industry had staying power. In 1900, Maine had about 75 sardine factories, 51 of them at Eastport and Lubec or close by. By the mid-1980's, after many ups and downs, Eastport and Lubec had only two plants operating. American operators generally laid their shutdowns to higher costs and a sharp

decline in U.S. per capita consumption. Meanwhile Connors, with only a handful of plants from the beginning, and with a more diversified market, remained one of southern New Brunswick's major employers.

Although the Canadian side has probably never had more than a dozen sardine factories at any one time, it has consistently matched and now outperforms the nearby Maine industry. The labor-intensive sardine plants helped give New Brunswick in the 1980's the highest ratio among the provinces of plant workers to fishermen.

The sardine and herring fisheries of southern New Brunswick provide a classic example of a situation that remained common in many fisheries at least until the 1970's: a strong plant influence on a fisherman-owned fleet. Although Connors generally kept clear of weir ownership, the company often advanced money to fishermen to build weirs. The fishermen thus incurred an obligation. Under normal circumstances, they gave Connors the first claim on their catch. (Maine factories advanced money to Canadian weirmen in the same fashion.) A company vessel generally carried the fish from the weirs to the plants. Connors wielded strong influence over weirmen and over fishery management by the government, sometimes causing complaints.

Yet, the American market provided competition for Connors; about half the New Brunswick catch went to Maine factories. Though Connors had some carriers, independent fishermen had a bigger fleet. Fishermen retained an independent attitude. Although Black's Harbour became known as a company town par excellence, the Connors operators dealt man-to-man with fishermen, who accorded the company a sometimes grudging respect.

HERRING DEVELOPMENT

The fisheries service made some attempts to develop the fishery for larger herring, then sold smoked or pickled. In 1889, the Department commissioned a report on the herring fisheries of the U.K. and Holland. The Committee involved heard the same message from Canadian fishermen that Moses Perley's inquiry had heard in the Bay of Fundy four decades earlier: better quality requires a price differential. But the final report suggested everything else but that.

In the early 1900's, E. E. Prince brought over J.J. Cowie from Britain, along with half a dozen "Scottish herring girls" to demonstrate better curing methods. Cowie, who later became a department stalwart and briefly Deputy Minister, also demonstrated "drifting" gillnets at sea in the British method.

Among the pelagic and estuarial species, the

"Scottish herring girls" brought to Canada from Great Britain by J.J. Cowie .

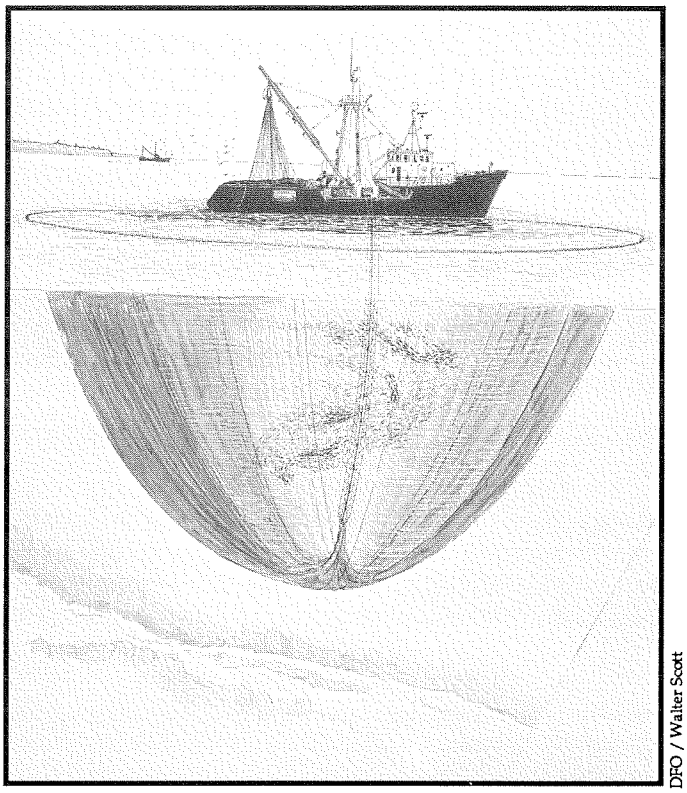
Maritimes smelt fishery grew rapidly in the 1880's. The Department in the 1880's, extended its regulations from New Brunswick to Nova Scotia, with special licences for bag-nets.

THE PURSE-SEINE BAN

Mackerel scarcity in the Gulf of St. Lawrence, beginning in the late 1880's, helped to focus concerns about overfishing.

An American report in 1887 summarized the fishery's history. Before 1870, mackerel got caught by hook and line near shore. The coming of the purse seine saw the fishery move offshore, outside three miles or on the high seas. "Of late years mackerel, in common with other varieties of fish that once were found in plenty near shore, are now seldom found in abundance within three miles of land, and oftener wide out, or on the more distant fishing banks....The North shore of Prince Edward Island and Cape Breton are the localities in the inshore British waters which are now chiefly visited by American vessels in pursuit of mackerel....Then too, the change in the method of fishing has, in recent years, led to the almost practical abandonment of the mackerel fishery in the Gulf of St. Lawrence....The catch of mackerel in the Gulf of St. Lawrence, not to speak of the inshore waters under British control, has been of comparative insignificance during the last decade."

The Department set some mackerel protection regulations, including in 1892 a prohibition against leaving mackerel, herring, or gaspereau nets in the water during the day, and against tying together a fleet of gillnets longer than 60 fathoms. The chief regulation,



DFO / Walter Scott

Purse seining with a modern seiner.

however, involved the purse-seine.

This method, improved and mechanized with purse-rings and winches by American fishermen in the 19th century, is highly efficient for catching large volumes of pelagics. It needs fewer people than would be required with hooks, gill-nets, or fixed enclosures. But if there were fears in the 1890's that the purse-seine would eliminate jobs, they were muted. The official reason to dislike the purse-seine was that it depleted stocks.

Around 1888, steamers followed schooners into purse-seining. Department officials and fishermen soon blamed the purse-seine for mackerel depletion. Capt. Gordon wrote that only new regulations had saved that fishery from extinction.

As opposition to purse-seines grew, the Canadian government approached the U.S. for an international ban. Otherwise, if American fishermen kept using purse-seines off Canada, it would be difficult to ask Canadian fishermen to give them up.

When no action came from the U.S. side, the Canadian government banned purse-seines anyway, on August 28, 1891. Anyone using a purse seine would face a penalty of $50 to $500, and the government could also confiscate his vessel, boat, "and apparatus" used with the seine.

The ban was to last on the Atlantic till the 1930's. In British Columbia, however, the ban was never so complete, and the Department allowed earlier use of purse seines.

Instead of limiting quantities of fish caught, the Department had penalized efficiency. The bultow (also known as "trawl", or "longline") and the cod-trap, though they caused complaints, had made their way into the groundfish fishery. But the purse-seine for pelagics suffered damnation.

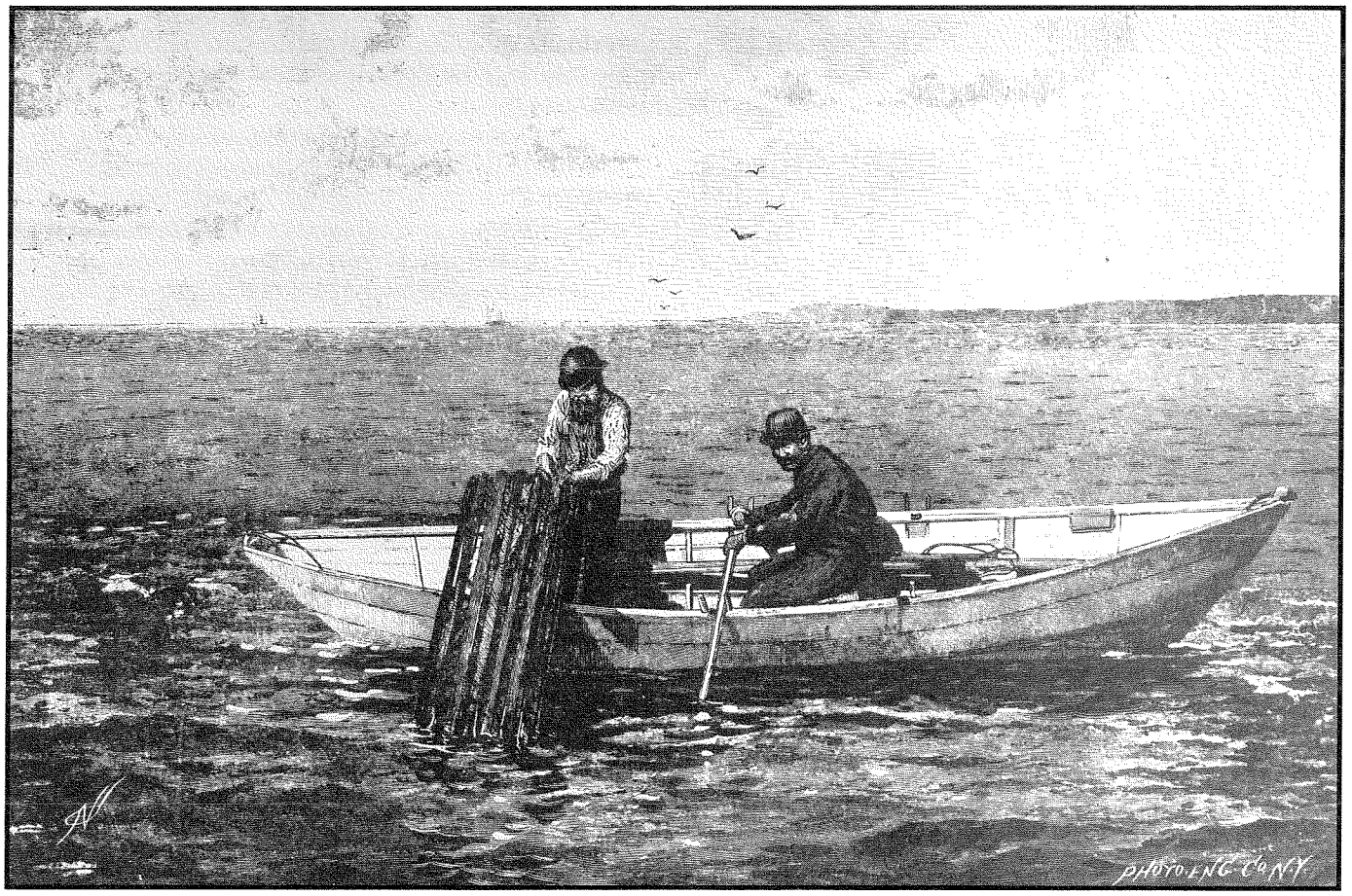
THE LOBSTER BOOM

As early as 1873 Whitcher had warned about overfishing lobster.

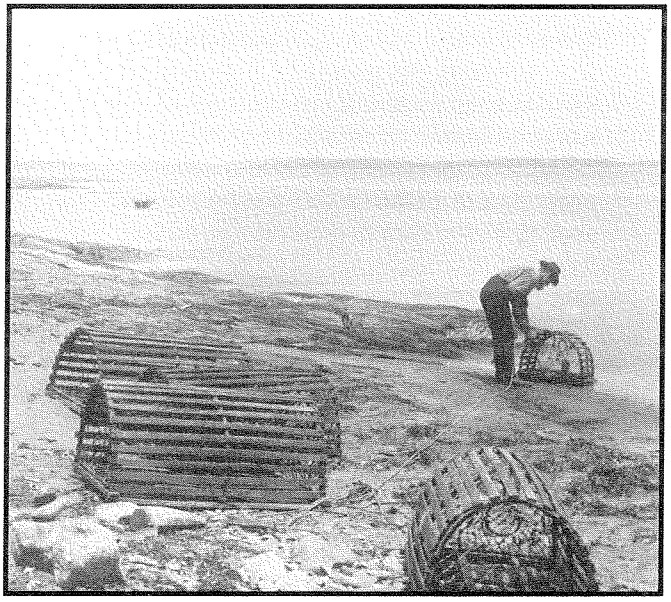
> *This fishery has but lately assumed commercial importance, and is prosecuted chiefly on the coasts of Nova Scotia and New Brunswick. In the former Province about forty, and in the latter Province about twenty-four, factories are now in operation for the preparation and canning of lobsters. ... [The rapidly increasing volume and value] point to the necessity for economising and perpetuating the natural supply. It seems that excessive fishing has exhausted the lobster fishery along the north-eastern coast of the United States; and that the enterprise which was embarked in the same has now been transferred to Canada. Such being the case, if the same indiscriminate fishing should be practiced on our coasts, similar results might occur. Doubtless, for a short time all persons interested would prosper, and the country may appear to benefit by the rapid and extensive development of this resource; but a period of reaction must necessarily ensue, commencing sooner or later in an enfeebled or exhausted condition of the fishery. ... There is nothing easier than to exhaust a shell fish fishery, and nothing harder than to revive it. The oyster fishery of the country should serve us as a warning example.*

Even more than the B.C. salmon industry, the Atlantic lobster fishery was expanding explosively, as Canadians followed the American lead. From 1873 to 1883 the number of lobster factories in the Maritimes went from 60-odd to nearly 600. In Quebec, lobster canneries increased from 11 in 1877 to 99 in 1889. Most operations were small and labor intensive, with workers soldering the tins by hand. Some exports of live lobster to the U.S. began.

As in B.C., this huge expansion brought the threat of overfishing. But rather than concentrating at



Early days in the New England lobster fishery.



Tending lobster traps at The Ovens, Lunenburg, Nova Scotia, 1879.

river mouths, as did the B.C. salmon fishery, the lobster fishery scattered itself all over the coast. There was no crowding of massive fleets into one spot to make the problem visible. Regulation came more slowly than in B.C.

The rules concentrated on sizes and seasons. The first regulations in 1873 forbade the taking of spawn-carrying lobsters, lobsters weighing less than 1-1/2 pounds, and soft-shelled lobsters (newly moulted and less marketable). Whitcher consulted his fishery officers by letter about closed seasons, which came into effect in 1874. Besides a closed season everywhere in the Maritimes during July and August, the new rules set a nine-inch size limit on overall length. The Maritimes industry made vigorous objections.

In 1877 regulations set different closed seasons for various sections of the coast, and new rules in 1879 lengthened the closed seasons to last from dates in August to dates in April. The idea was partly to get lobsters when they were in best condition, partly to reduce exploitation. Gordon DeWolf's 1974 study on the economic effects of lobster regulations points out

that "an important effect of the long closed season was to make lobster fishing a part-time activity. There were complaints from fishermen who depended upon sales for their winter supplies... and from cannery operators because the season was too short...."

Still the catch climbed steadily. Regulations put no control on the ever-rising number of fishermen and traps.

In the 1880's, the fisheries service gave at least some consideration to licences and leases. Gordon DeWolf notes that:

> *Among cannery operators, disputes often arose regarding property rights. A cannery might control a 2-to 4-mile frontage and, if successful, might attract other canneries to the same region. Established canneries complained of unfair competition and pressed for a leasing system that would give them defined property rights. Fisheries inspectors also pressed for a leasing system to stabilize the industry. ... They argued that canneries would be much more concerned with protecting lobsters if they were guaranteed future property rights. The federal government favored free competition and argued that exclusive fishing rights would create a monopoly and take away bargaining power of fishermen.*

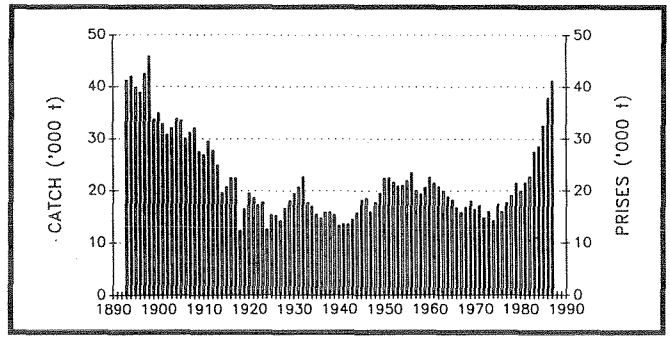
By 1886, Deputy Minister Smith himself was saying in the Annual Report that lobster were overfished and something must be done. An 1887 royal commission tried among other things to protect lobsters during their spawning period. Their recommendations led in 1887 to new closed seasons: west of Canso, 1 July through 31 December; and elsewhere, 15 July -31 December.

As the early rules went through various adjustments, a new market was developing. Fishermen already knew about lobsters' ability to survive on shore. Early in the 19th century some Nova Scotians sent several barrels of live lobster on a sailing vessel to King George III. As the commercial fishery developed, shipments of live lobster to New England by sea began in the late 1870's. In 1891, the department helped a Captain McGray in an attempt to ship live lobsters to England.

STEEP DECLINE IN LOBSTER STOCKS

In the 1890's the value of lobster kept climbing. By the end of the century canned lobster would rival salt cod.

But the average size of lobsters caught dropped from 2-4 pounds to a pound or less. By 1900, average



Lobsters were long recovering from turn-of-the - century declines.

weights packed were often well below half a pound.

Early in the 1890's, Samuel Wilmot and E. E. Prince suggested stricter licensing in the lobster fishery, including restrictions on the number of canneries. (From 1893, canneries paid licence fees proportional to the volume canned: $2 per 100 cases.)

A series of reports and regulations culminated in a Royal Commission of 1898, under Prince. The report noted that "the failure of the mackerel, cod and other fisheries, has had a great deal to do with compelling a large number of fishermen to take up lobster fishing with the result that the fishery has become practically the staple industry along large portions of the coast."

Although U.S. interests had pioneered the lobster canning industry, still it would better if Canadian factories belonged to Canadians, said the commissioners. The department should cease issuing licences to U.S. owners.

The canneries should be spaced out at equal distances along the coast. Some might well ease the tight situation by diversifying into the canning of fruit. There should be temporary lobster reserves, closed to fishing. And those in the industry needed more information and education about it.

Nothing significant seems to have emerged from these recommendations, certainly not on spacing out canneries or otherwise limiting entry. Perhaps the government saw the open employment as necessary, given the weakness of other fisheries.

The Royal Commission resulted in creation of six lobster districts, with longer fall and winter seasons in the south, shifting as the year advanced to shorter summer seasons in the north. Regulations also created size limits, larger in the south and smaller in the "canner" districts of eastern Nova Scotia, Cape Breton, and the Gulf.

Prince's regulations, with periodic readjustments, remained the basis of lobster management until the 1960's.

Prince's royal commission noted that it was "impossible to state the effect of past regulations." But for the most part, his commission only elaborated on previous regulations, making them comprehensive for the Maritimes. Forever after, enforcement of lobster regulations has taken a great part of the Departments' efforts.

THE LOBSTER BUST

Despite the new regulations, Canadian landings kept dropping, from about 45,000 tonnes in 1890 to about 30,000 by 1909. The number of canneries was 578 in 1896, up to 760 in 1900, back to 593 in 1909-10.

Fishermen were taking younger and younger lobsters. After about 1900, the gas engine came into more and more use. With it, the fisherman who had fished maybe 75-90 traps from a dory or sailboat could fish 250-300.

Given the alarming decline of lobster, fishery officers around 1906 began refusing new licences -the Department's first notable attempt to limit entry in Atlantic sea fisheries.

This action brought complaints and demands for a new inquiry, duly carried out in 1909 by the redoubtable Commander William Wakeham, officer in charge of the Gulf fisheries division. Wakeham was less alarmed than his predecessors about over-fishing. Yes, the size of lobsters had gone down; but the pack had stayed more stable because fishing effort had increased, with more boats, better traps, and motorized boats working more ground. Although one couldn't drain the fishery forever, yet the lobster showed "wonderful vitality" against destruction.

In today's parlance, one would call Wakeham a de-regulator. He recommended open entry for fishermen, with no licence necessary; and open entry for canneries, without allowing too many canneries for any one person. Strikingly, he recommended no size limit except in the Bay of Fundy, which served the live-lobster trade.

New regulations in 1910 applied size limits of 4-1/2 inches carapace length in Charlotte and Saint John counties, New Brunswick, and a 9-inch overall size limit for the rest of the Bay of Fundy. Elsewhere, size limits vanished. Following Wakeham's recommendation, regulations for the rest of the Maritimes set a minimum lath spacing, to let small lobsters crawl out of the trap. But this regulation got rescinded in 1914.

The department asked factories to report the number of fishermen, traps, workers, and so on that they used. The fisheries service expressed the intention to favour fishermen's co-operatives. But regulation remained basically the same, based on seasons, protection for egg-carrying lobsters, and in the Bay of Fundy, size as well.

The whole affair ended for many decades any serious attempt to limit lobster licences. Wakeham's dismissal of depletion as exaggerated, and his questioning of size limits, may have contributed to a certain weakening of enforcement, never that strong in the early fishery.

PRINCE FAILS TO GET LIMITED ENTRY

The lobster fishery continued to fall off. Around 1900, catches ranged around 32,000 tonnes; by 1920, less than 20,000 tonnes. The number of Maritimes canneries went from 760 in 1900 to 512 in 1920.

In 1912-13, Prince headed a Royal Commission on Atlantic shellfish, and returned to the old question of licence limitation. The Maritimes lobster fishery in 1913 had 25,000 fishermen (more than double the number in the 1980's). Despite industry resistance, said the commissioners, the department should resume the licensing strictness of its earliest years, and limit entry into the industry.

Prince wrote: "So long as the taking of lobsters on Canadian shores is a free fishery, so long will it be difficult to carry out the preservative measures that are desirable." The lack of such measures would exhaust the fishery.

But it was to take more than half a century before the department limited entry and the lobster catch climbed.

The royal commissioners also noted that lobster fishermen might well be licensed to fish in specific areas only. This regulation finally came to pass in the 1940's.

The Royal Commission noted that tagging of lobster had proved them non-migratory, a conclusion that has stood up fairly well over time, although larval transport of young may cause events in one area to affect another. The commissioners also said the suggestion of limiting boats to 300 traps each would never work. (In the 1960's and 70's, however, such limits became a basic part of lobster management.)

Prince also wrote that fishery patrols were inefficient, and needed a host of improvements, including motor boats.

The Royal Commission of 1912-13 resulted in no great changes. In 1918, there was a new flurry of concern. The Fisheries Branch proposed canning of lobsters only every second year, or else closing the fishery for a number of years. Although this came to nothing, the Department did shorten the lobster seasons. It also started requiring lobster licenses, but more as a pro forma matter, without restricting entry.

The commotion and concern about the Maritimes lobster fishery subsided to a lower level, without vanishing. Policing of lobster regulations continued to occupy many of the Fishery Officers and guardians. Seizures of boats for illegal fishing took place from time to time.

Only in the 1930's did size limits reappear around the coast. And only in the 1980's did a major upsurge in lobster landings take place, apparently because of environmental changes coupled with strict limits on fishing effort. These limits came more than half a century after Prince's and the Department's first attempts at limited entry.

SCALLOP FISHERY START-UP

The fishing industry in the 1890's started up a small fishery for scallops on New Brunswick's Bay of Fundy coast, around L'Etang. Only around 1920 would the better-known Digby, N.S. scallop fishery begin.

DEADLOCK IN THE OYSTER FISHERY

Oysters, a tiny fishery compared to lobsters got a lot of attention then and later from researchers and managers. This is perhaps because, as with Pacific salmon, the fishery is so visible and close to shore.

In 1887, the government appointed a commission to "enquire into and report upon the lobster and oyster fisheries of Canada." An expert hired from the United Kingdom, Thomas Kemp, damned the excesses of overfishing, cupidity, and stupidity that had harmed the fishery, and suggested size, season, and licensing regulations.

Deputy Minister of Fisheries John Tilton warned of the threat of extinction. In 1891, the Department began licensing oyster fishermen (without limiting their numbers), and granting leases. It also circulated a petition to the public to help strengthen its hand in oyster regulations. In 1893, the government passed further regulations including sizes and seasons. All this still seemed insufficient. In 1898, the distinguished Prof. W.F. Ganong noted that the fishery's fate must be either vigorous government interference or a slow death.

After an 1898 court judgement expecting federal and provincial fishery powers, a deadlock ensued between federal and provincial governments. No more leases got issued. A 1910 modification to the Fisheries Act, intended to make possible a modus vivendi (then the catch phrase for any convenient compromise between governments) brought no results. Oyster culture remained at a standstill for many years, since the Dominion ruled the fisheries but the province owned the shore.

Meanwhile, Ernest Kemp kept writing long reports on the proper way to breed oysters and regulate the fishery. The fisheries service paid him to get a steam tug and use it to seed oysters and clean oyster beds.

DEVELOPMENT AND DOGFISH

Along with Kemp's work on oysters, research and development in the 1880's included Mowat's exploratory fishing, fish culture by Wilmot and others, and some early research on mackerel. Other attempts at development mostly involved underutilized species, and mostly petered out. The quintessential underutilized species is dogfish. They are a nuisance preying on other fish and destroying lines and nets. So why not fish them, to make some money and help conservation?

A special report by Prince in 1903 considered the dogfish question. He noted suggestions of dynamiting them, or inoculating them with fatal diseases. In 1904, the government decided against a bounty, and instead put up the first dogfish reduction plant at Canso, N.S. The government bought the fish, and produced fertilizer or fish meal from the nuisance fish. In the next few years, two more plants came into being.

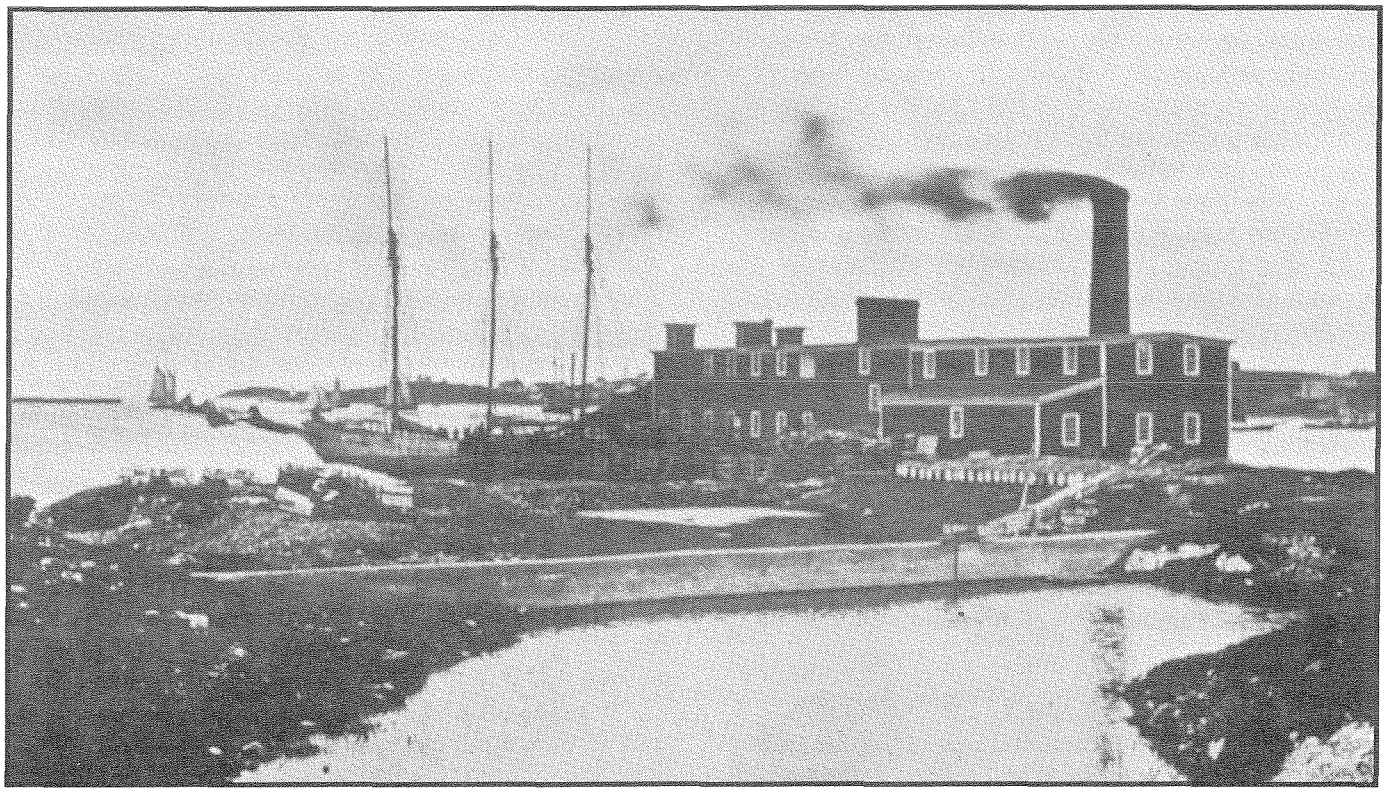
But in the next decade the plants faded away. Dogfish turned out to be harder to catch than people had thought; they were hard to handle; and the whole venture was uneconomic. This was to be the first of many unsuccessful attempts to deal with dogfish.

In a special report in 1907, Prince urged attention to other underutilized species such as catfish, sturgeon, skate, rock eel, roe in general, abalone, mussels, kelp, walruses, and whales. He was careful to note that market, and enough volume to make a living, were essential.

Later years brought little development for most of these species, at least until after World War II. The fishery developing for sturgeon at the turn of the century was soon to fish them down. Whales in Newfoundland were heading into a short boom and bust. Walruses remained underutilized because they never recovered from the early fishery. A small eel fishery continues today.

After World War II, more fisheries took off. But even then, development of fisheries was often a story of fits and starts and many failures.

An Irish moss industry developed in the Maritimes in the 1940's. It took four more decades for a small rockweed industry to get going in the Bay of Fundy. Roe fisheries remained minor in Canada until the herring-roe fishery in British Columbia rose to



The dogfish reduction works at Canso, N.S. (top). The vessel at the wharf is being loaded with fish scrap. A steamer discharging a cargo of dogfish at the wharf of the Canso, N.S. reduction works (bottom).

prominence around 1970, mainly because of the Japanese market demand. An Atlantic herring-roe fishery became strong in the 1980's. A strong fishery for crab took hold in the 1970's in the Gulf of St. Lawrence and Newfoundland. In the same decade, a fishery developed for northern shrimp off Labrador. Also, an important fishery for Atlantic mussels developed rapidly in the 1980's, when provincial and federal development work combined with new North American market demand. Federal research and development also stimulated a new fishery for Stimpson's surf clams off Nova Scotia in the late 1980's. Among groundfish, although redfish were already well known, Canadians began to make good use of them only after World War II with new midwater trawls. Although northern cod off northeast Newfoundland and Labrador had provided a historic fishery for schooners in the old days, and for overseas vessels after World War II, Canadians offshore trawlers only asserted themselves in this fishery in the late 1970's and the 1980's.

In the late 1980's, federal attempts to develop a silver hake fishery off Nova Scotia were starting to show at least some promise.

Prince was right to point to volume and especially to the market as key elements. It would seem that fisheries for underutilized species have a better chance to develop when a market already exists somewhere. This happened with herring roe, with snow crab, with mussels, and with shrimp. But attempts in the 1970's to develop a capelin market from scratch went nowhere.

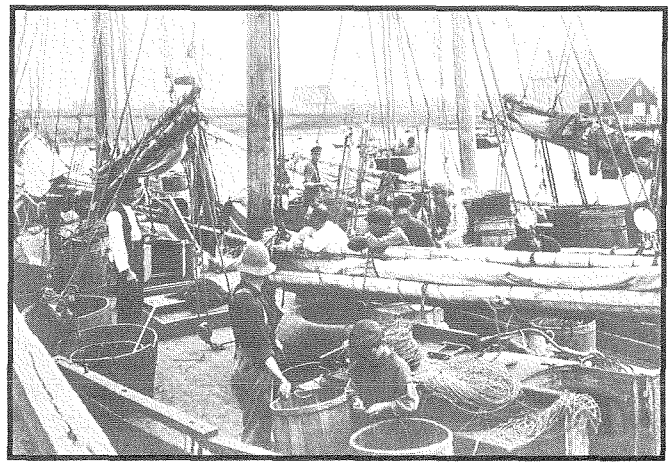
MORE ROYAL COMMISSIONS

Besides the major royal commissions, there were many minor activities on the Atlantic. For example, in 1903, a royal commission looked at the sardine fishery in the Bay of Fundy. In 1903-04, the fisheries of New Brunswick in general and Gloucester County in particular came under investigation. In 1906, John F. Calder investigated U.S. ownership of fishing licences on the Canadian side of Passamaquoddy Bay, N.B. Another Royal Commission, starting in 1908, followed the decline in the Bay of Fundy shad fishery.

An Order in Council of September 12, 1907 set a host of regulations for fisheries across the Dominion.

ENGINES CHANGE THE INDUSTRY

Far more than government efforts, technology was changing the fishery. The gradual coming of gas engines gave more mobility to smaller boats, which remained by far the most numerous, on both coasts. By 1910-11, some 5,000 Canadian fishermen used gas engines, by 1915, about 15,000.



National Archives of Canada

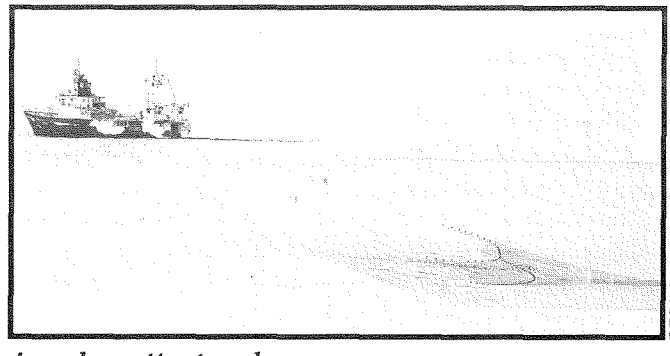
Fishermen at Souris, P.E.I., circa 1910.

Around the same time, "cold-storage" or freezing plants using the new mechanical-electrical methods of refrigeration were appearing here and there, for fish, bait, or ice itself. In 1910, senior official R.N. Venning made the grandly wrong prediction that lobster boiled in the shell and then frozen would displace the still-young live lobster trade.

Halibut steamers were appearing on the Pacific, and early in the 20th century, some trawlers on the Atlantic. Towed trawl nets (not to be confused with long-line "trawls") had become common in Europe in the 19th century. Fishermen had first used a fixed beam to keep the net's mouth open. Then beam trawls gave way to otter trawls, using two wooden "doors" that acted like underwater kites.

A number of steam trawlers began working from Canso around 1910. By 1917, there were four steam trawlers on the Atlantic, one on the Pacific. The Atlantic trawlers were said to have "immensely stimulated the trade in fresh fish, by the regularity with which they land supplies."

But in 1909-10, the "vessels" in the "offshore"



DFO / Walter Scott

A modern otter trawler.

Atlantic fishery were still almost all sailing craft, rather than steam trawlers. Often, family-run operations owned anywhere from one to a couple of dozen schooners. There was no equivalent to the two large companies today -National Sea Products and in Newfoundland, Fishery Products International -that at one time in the 1980's together owned more than a hundred offshore trawlers, and which dominate the big-boat fishery.

The general Atlantic industry from 1880 to 1910 was if anything going in the other direction, against consolidation, as engines made mobility and fishing power cheaper for the individual owner-operator. Companies like the Robins in the Gulf and the large merchant firms in Newfoundland had lost their air of dominance.

That being said, the Lunenburg County schooner fleet was getting stronger throughout the period; and it was the forerunner of offshore consolidation in the future.

(The term "offshore," a loose and debatable one, generally means larger vessels, most often owned by companies rather than individuals, that are able to stay at sea a week or more at a time, and fish banks 40-50 miles or more offshore. "Inshore" originally meant, generally, open boats that fish a day at at time. Especially since World War II, and especially in Nova Scotia and New Brunswick, there has been great growth of the "midshore" fleet: individually owned and operated, under 100 feet, yet with high fishing power.)

LUNENBURG SHIFTS TO THE BANKS

Lunenburg led Canadians and Newfoundlanders in turning to the offshore banks.

In the last quarter of the 19th century, because of moves by the Newfoundland government, Maritimers and New Englanders found it harder to get bait from Newfoundland shores, or to trade with Newfoundland and Labrador residents.

At the same time, there were difficulties with inshore fisheries. The Labrador fishery had suffered bad fluctuations. In Nova Scotia's own shore fishery, fish had become scarcer. Mackerel, under heavy U.S. fishing pressure, had become an uncertain fishery.

Nova Scotia vessel operators had to rethink operations. Lunenburg in particular followed the American lead in turning to the offshore banks around 1873. At the same time, the Lunenburg fleet adopted Gloucester-style flat-bottomed dories, and turned to longlining.

The use of baited trawls at first caused protests, and fishermen had some difficulties finding bait. But the method would become more and more popular. Whether it is longlines, purse seines, or freezer trawlers, the superior technology always seems to win out in the end.

Why did the small town of Lunenburg (population today 2,800) take the lead over such nearby ports as Liverpool and Lockeport, equally well situated? No major factors suggest themselves, except Lunenburg's habit of hard work, combined with a willingness to invest in local fishing operations. Joint stock companies, often with fishermen prominent in them, owned schooners. This company structure linked shore-based dealers and fishermen, fostering market ties and lines of credit.

Lunenburg's fleet by 1910 grew to more than 140 vessels. Many obstacles, including the U.S. switch to fresh fish, the loss of some Latin American markets, and stronger competition from other countries with trawlers, affected the Lunenburg fleet. But Scott Balcom, the authority on this fleet, notes that its efficiency helped stave off the consequences until after World War I. And even then, Lunenburg entrepreneurs survived the Depression to build up the single strongest fleet and biggest fishing company in Atlantic Canada.

THE LIVES OF FISHERMEN

Maritime fishermen in the 1880-1910 period generally lacked organization, and possessed no great role in Canadian politics. Information is scarce on incomes. The ceaseless out-migration suggests that they were generally low. Captain Gordon of the Fisheries Protection Service said in 1890 that the crewman on a highline vessel might earn $150; on a "high average" vessel, fishing groundfish, mackerel, and herring, more like $88 for the season. He would get one-quarter of whatever he caught by hook, and every fifth barrel that he caught by net. The owner on an ordinary vessel would get about $280. Although figures are scarce, there appears to have been no notable change in earnings in the two following decades, until the brief fisheries prosperity of World War I.

Generally speaking, of all Atlantic fishermen, those in the southern Maritimes did best. Always allowing for exceptions, the farther north and east the fishermen lived, the less substantial his boat and income.

Although the situation varied, everywhere in the Atlantic fishermen typically lacked money and power, and were now part of a trailing rather than a leading element in the economy. Even so, fishermen had some compensations in the quality of their life. Most were their own bosses, with their own boats and their own houses. If they were isolated, often without good

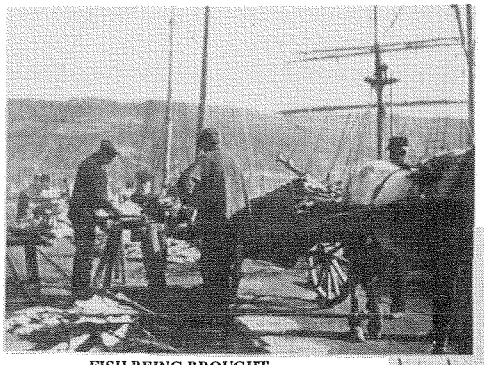
medical care or libraries or other amenities nearby, still they had the pleasures of the coast and of close-knit communities.

NEWFOUNDLAND: WEAK ECONOMY, WEAK FISHERY

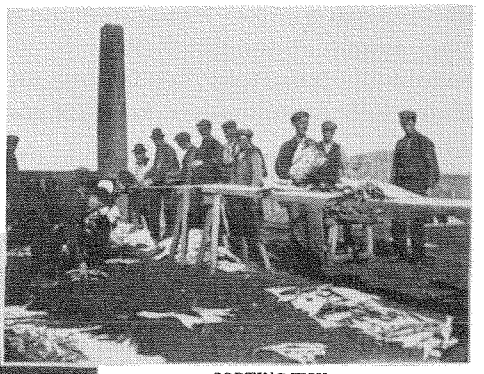
With a growing population -up five-fold during the century -but no growth in the fishery, Newfoundlanders in the last quarter of the 19th century felt hard-pressed.

Atlantic Canada in this period was well behind the north-east United States in development and prosperity; and Newfoundland was well behind Atlantic Canada. The fishery was still life and death to the province, providing by far the most work. Lumber, newsprint, mines, and the railway were still offering only a bit of alternate employment.

As in the Maritimes, Newfoundland's leaders were putting their ambitions elsewhere than the fishery. The government commenced railway building in 1880, the same year the Macdonald government

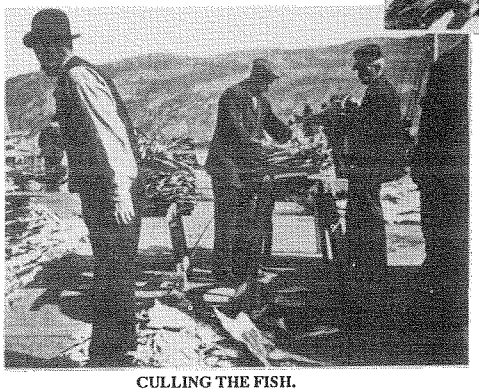


FISH BEING BROUGHT INTO ST. JOHN'S.

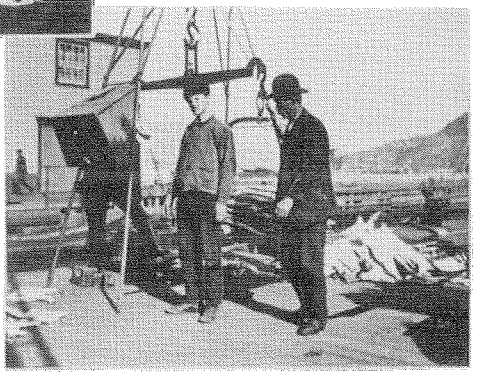


SORTING FISH.

LANDING FISH FROM THE SCHOONER.



CULLING THE FISH.



WEIGHING THE FISH.

National Archives of Canada

Newfoundland fishing scenes from R.E. Holloway's 1910 book "Through Newfoundland with the Camera".

commenced the Canadian Pacific Railway. Five years later, the CPR had reached Vancouver; the Newfoundland railway from St. John's had reached only the nearby port of Harbour Grace.

The colony went deeply into debt to build its railway. Fire destroyed most of St. John's in 1892. In 1894, the banking system collapsed. Canadian banks moved in. For a period, there was interest in Confederation. But when Canada objected to assuming Newfoundland's entire $16 million debt, discussions broke off. In 1895, Britain had to provide relief for Newfoundland fishermen, in the form of supplies for the new season.

The colony was going through the same convulsions as the Maritimes after the decline of the wood-wind-water economy, only worse. Despite her legendary abundance of cod, Newfoundland had a less varied, more seasonal fishery than the Maritimes. And Newfoundland had even less linkage with the new railway-agriculture-manufacturing economy of the continent.

Newfoundland struggled on, gradually completing the railway, encouraging foreign investment, promoting mining projects, and so on, with an optimism that makes Maritimers look like morose existentialists. But building up other industries was to take a long time.

Meanwhile, the fishing and marine industries were becoming stagnant. The 1880's were probably the high point of Newfoundland's traditional marine economy. But fishery growth was already falling behind population growth. While Newfoundland's population more than doubled between 1845 and 1891, cod exports rose only 25 per cent. As early as 1880, the Joint Committee of Council and House of Assembly was saying that the fisheries offered little hope of increase.

The adoption of steamers lessened employment in boat-building and at the seal hunt. Seal production itself declined after the 1860's. The historian Prowse wrote in the 1890's that "Politics and steam have done more than any other cause to ruin the middle class, the well-to-do dealers that once abounded in the outports."

Boat-building also weakened when steel steamers in the 1880's set up new routes to the West Indies and Brazil. Newfoundland in 1887 put a bounty (subsidy) on shipbuilding to help the bank and Labrador fisheries.

The schooner fleet made more and more use of superannuated Nova Scotia vessels, "slop-built" according to the historian Prowse. The bank fleet in 1901 had 118 vessels, with Grand Bank the main port. Americans, Canadians, and French also took part. As American and some Canadian schooners turned offshore to the Grand and southern banks, Newfoundland vessels became more dominant on the Labrador. The Labrador floater fishery in the decade 1990-1910 reached its high point; in one season, more than 1,400 vessels took part.

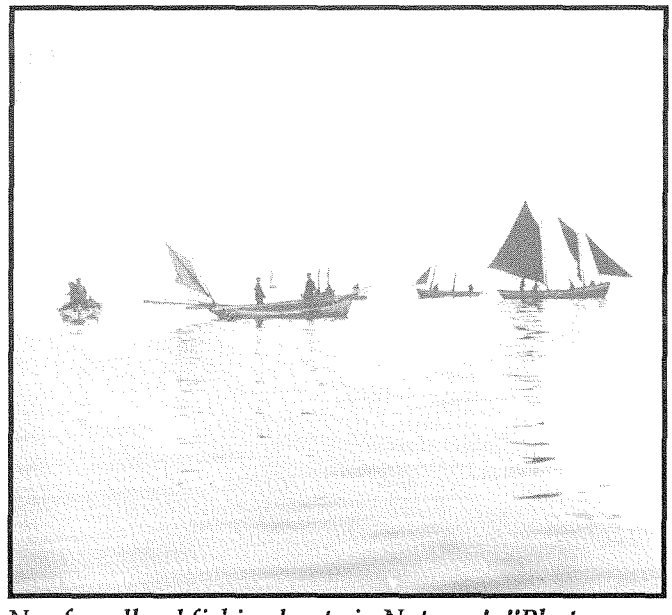
Gas engines were seeing use at least by 1910; and there was at least one attempt to use a steam trawler.

Although by the last quarter of the century the production of cod was stabilized within a certain range, every down year seemed a major problem. Markets weakened as some customers faced harder times. The United States was turning more towards fresh fish rather than salt. Some countries such as Puerto Rico and Cuba, under American tutelage, were raising tariffs. Only Brazil provided a growing market in the latter part of the century.

Meanwhile, France and Norway increased their competition, aided by trawlers. To add insult to injury, the subsidized French fleet used Newfoundland bait to fish the cod off Newfoundland's shores.

Newfoundland's marketing system was weak. Unable to hold any kind of price, exporters large and small tried to out-race each other to the overseas markets. Selling on consignment became more and more common. Weak marketing and a weak industrial structure led to low and unstable prices to the fishermen.

In comparison with cod seines in the shore



Newfoundland fishing boats in Notman's "Photographic Series, Vol. VII, Newfoundland" (Montreal, 1907).

fishery, the cod trap produced bigger volumes, and extended the season. As steamers made it easier to get passage to Labrador, the number of fishing stations increased. The merchants' control over operations, including production quality, decreased. More and more, fishermen sold their salt cod "tal qual" -a single price, whatever its quality. The decline in quality helped breed future troubles.

As the century drew to a close, some of Newfoundland's old, major merchant firms retrenched into wholesale supply and merchandising. Smaller enterprises, ranging from local merchants of "planters" with several vessels to single families with one small sailboat, competed with the old-time merchant operations. But they failed to match the product quality.

St. Mary's Bay was typical, with a mixture of small and larger craft, jacks and western boats that mostly fished in the bay or near the mouth, and some larger vessels that went to the Grand Banks. Local merchants had stores and small fleets, and could advance limited credit. For the most part, fishermen dealt with merchants in St. John -the only ones able to advance substantial credit.

Fishermen would finish up the year and take their quintals to fish to St. John's on their own vessel, or sent it aboard somebody else's, to firms such as Job Brothers and Bowring's. They would also send or take a list of provisions -everything they needed for the next year -which would come back by the same boat. Very little money might be left after buying supplies. By "the hungry month of March", money would be scarce indeed. Planters would sometimes employ hard-up people who would work just for food and maybe a few articles of clothing.

Most dealings were in truck. Local merchants who sold household and other goods also bought fish, and would deduct the value of a man's fish from the amount he owed for goods. In some years, a fisherman might never see cash. The diet was largely fish. When chickens were imported to the northeast coast, some people unused to them preferred to keep them as pets. Death at sea remained common; in 1902, for example, 17 lives were lost in the bank fishery, eight in the shore and Labrador fishery (the Gloucester fleet lost even more).

NEWFOUNDLAND STARTS FALLING BEHIND

Newfoundland in the 1880's still did relatively little fishing on the offshore banks. To quote an 1877 report by the well-known naturalist, H.Y. Hind: "In Newfoundland the *deep sea fishery*, as distinguished from the fishery pursued in coastal waters, or within three Marine miles from shore, has scarcely a separate existence. The vessels...are used chiefly for the purpose of sailing from one Coastal Fishery Station to another on the Island of Newfoundland, or for the Labrador Fishery."

The Newfoundland fishery and the Maritime-Quebec fishery in the 1870's were of roughly equal size. But in shifting to the banks and developing new fisheries, the Maritimes were beginning to show more dynamism.

Indeed, a parting of the ways was beginning. A century later, the Maritime fishery, though far from universally prosperous, is well ahead of Newfoundland. It changed more, and for the better. Compared with Newfoundland today, the Maritime and Quebec fleet is smaller but more productive; fishing incomes are higher; boats are bigger; and processing provides a great many more jobs.

Hind's report makes a convenient reference point. Hind noted that the Newfoundland shore fishery in 1874 employed 18,611 boats. The vessel fleet numbered 1,197, averaging about 51 tons. Of the total 19,808 fishing craft, one in 15 was a decked vessel.

The Maritimes and Quebec shore fishery in 1876 had 20,241 boats, slightly more than Newfoundland had. The vessel fleet numbered 1,379, also slightly more than Newfoundland. But Maritime and Quebec vessels tended to be smaller, an average 32.5 tons. Of the total of 21,620 craft, about one in 15 was a decked vessel, the same percentage as in Newfoundland. Broadly speaking, the two fleets were equal.

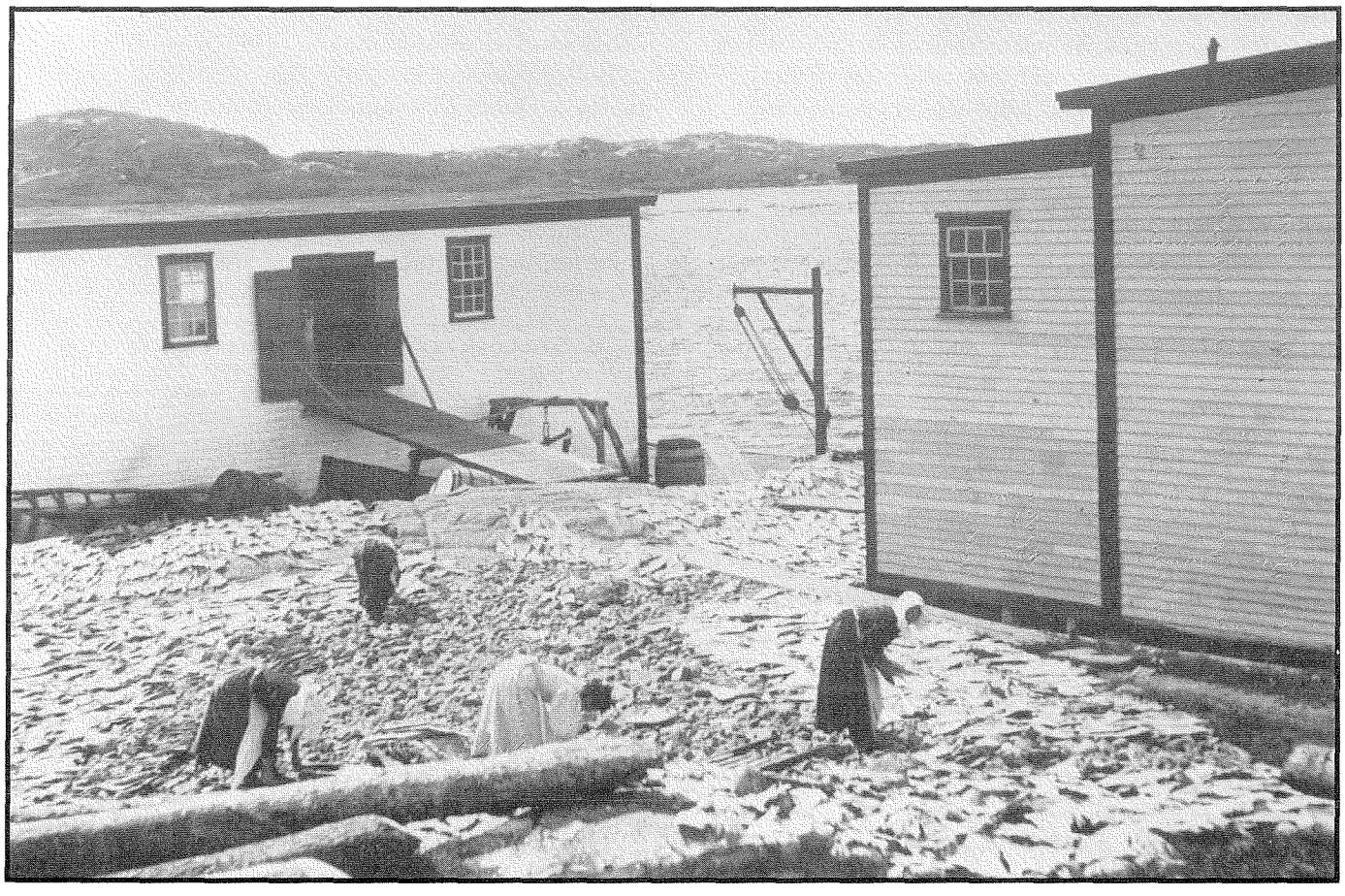
A century later, the Newfoundland fleet had changed less than one would expect. In 1983, of 16,520 fishing craft, only about one in ten was over 35 feet and over ten tons, which roughly equates to a decked vessel.

Meanwhile, the Quebec and Maritimes fleet changed profoundly. In 1983 it numbered 14,255, now less than the Newfoundland fleet. But in average vessel size, it had pulled far ahead of Newfoundland. More than half the fleet, roughly 8,600 vessels, exceeded the "decked-vessel" equivalent size of 35 feet and ten tons.

The Maritimes "midshore" fleet of medium-size vessels was strong and growing stronger. Of vessels 35-99 feet, Newfoundland in 1983 had only 1,460; the rest of the Atlantic had four times that many, roughly 6,100. Owner-operators in this fleet had far more fishing power.

Although far behind in "midshore" vessels, Newfoundland competes more closely in the offshore category. The province in 1983 had 91 vessels more than 100 feet long, two-thirds the Maritime-Quebec figure of 140.

Seasonality, lack of resource variety, and low



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Women tending fish flakes in Newfoundland, 1903.

incomes work against Newfoundland's midshore fleet. When fishermen have only a short season and one main species, smaller, cheaper vessels can be more cost-effective. It is harder to move up to larger craft. Extremes dominate the Newfoundland picture: a very large number of small, open inshore craft; a fair-sized and powerful fleet of large trawlers; and relatively little in between, although the dragger and longliner fleet was growing in the 1980's.

As for employment: in 1874, Newfoundland's shore fishery had 45,854 persons catching and curing fish; the vessel fleet had another 8,394 "fishermen sailors". Fishing employment including sealers thus totalled 54,248.

The Maritimes and Quebec in 1876 had 40,023 men in the shore fishery and 9,097 in the vessel fishery; altogether, 49,120 persons catching and curing fish, less than in Newfoundland. Broadly speaking, when one discounts the sealers in Newfoundland, the number of men fishing in the two fleets was fairly well similar.

In 1983, Newfoundland fishermen numbered 28,074: a sizeable decline in jobs. Plant employees numbered 7,256, for a total employment of about 35,000.

The number of fishermen in the Maritimes and Quebec had also dropped, to 28,425. But total employment was now well ahead of Newfoundland, because the Maritimes and Quebec as of 1982 had 21,929 plant employees. Total employment was about 50,000.

A century earlier, the Maritimes and Quebec were roughly equal to Newfoundland in employment and fishing power. By the 1980's they were well ahead in size of vessels, in fishing industry jobs, and in average revenues.

The Maritimes and Quebec kept their level of employment less by guarding old jobs than by developing new fisheries. Meanwhile Newfoundland remained largely the captive of cod, a fishery that in the 1870's was already three centuries old. The scattered statistics of the great fleets that sailed from Britain and Europe in the 1600's and 1700's suggest that early on, Newfoundland's fishery mushroomed to a high level of employment, and in later centuries never greatly exceeded that level.

Indeed, most new Canadian fisheries have expanded to their maximum within a short time, then stayed on a plateau or declined. But the Maritimes after 1870, had more new fisheries than Newfoundland to develop. Their herring, lobster, scallop, and crab resources all exceeded those of Newfoundland. As these fisheries came into play, they offset the decline of employment in the groundfish fishery.

NEWFOUNDLAND BATTLES OVER BAIT

Newfoundland in the 1880's was still trying to assert its power in the sea fisheries. The colony had won a major battle when the fisheries "Magna Carta" of 1856 recognized the importance of Newfoundland's voice. But Newfoundlanders were a long way from full control of the fishery.

Newfoundland lost some American market when the Treaty of Washington's fishery provisions ended in 1885. She now depended more on Europe. But markets there were softening too, as France and Norway increased their competition.

Newfoundland politicians saw the control of bait as a lever of power. Foreigners, especially the heavily subsidized French, were using bait bought in Newfoundland to catch cod. Why not halt the sale of bait to foreigners?

In 1886, the colony passed a Bait Act to control the sale of bait to foreigners, including Canadians. Canada immediately protested. Great Britain disallowed the law.

In 1887, Newfoundland passed another, this time giving assurances that Canadian fishermen would be on the same footing as Newfoundlanders. Canadians could even fish for their own bait inside three miles, just as the Americans could on the Treaty Shoe.

Later, however, Newfoundlanders accused Canadian and U.S. fishermen of weakening the Bait Act, by selling bait to the French at St. Pierre and Miquelon, including herring from Cape Breton, the Magdalens and Newfoundland itself. Meanwhile, the French were turning to salt bait, and to bait that they finished on the banks themselves. How much influence the Bait Acts had in discouraging the French fishery is unclear.

In 1890, a modus vivendi let the French buy licences for port privileges, much like Canada's and Newfoundland's arrangement with the U.S. This eased the situation, though tensions remained.

CANADA TORPEDOES NEWFOUNDLAND RECIPROCITY

The situation now changed with the Americans. After the Bait Act cut off purchases, they had had to fish their own bait on the Treaty Shore. This inconvenienced the still-important, though declining, American fishery at Newfoundland. In 1890, Robert Bond, a Minister in the Newfoundland government, negotiated with U.S. Secretary of State James Blaine a limited reciprocity treaty that would among other things, let the Americans buy bait, and let Newfoundland export fish duty-free to the U.S.

Canada, fearing American expansionism, objected that the Newfoundland fisheries were the common property of all British North America. Why should Newfoundland let in foreign vessels and block Canadian vessels? Any reciprocity arrangement should benefit all British North America. Great Britain consequently disallowed the "Bond-Blaine Treaty". Newfoundlanders saw this as a major injury, and some still resent it.

Stung by Canada, Newfoundland again restricted the sale of bait, except to Americans. Canada retaliated with duties on Newfoundland fish, and Newfoundland with duties on Canadian flour. In 1892, the tariff contest relaxed. Canadians could again buy licences to buy bait.

In 1902 Bond, now Prime Minister, tried again with the "Bond-Hay Treaty", negotiated with Secretary of State Hay. This time the U.S. Senate, in 1904, refused approval. Newfoundland had failed to get fisheries reciprocity with the U.S., and failed to achieve much with the Bait Acts.

The colony returned to the charge against the Americans. On the southwest and west coast of the island, the Americans still claimed the right to fish on their own terms, while Newfoundland claimed the right to regulate their fishery. A prime issue was whether Americans could use purse-seines, outlawed for Newfoundlanders. The Americans were interested largely in herring for food and bait. Besides fishing bait for themselves, the Americans bought large quantities. On October 31, 1902, for example, 20 U.S. vessels were buying winter herring at Bay of Islands.

After the U.S. Senate rejected the Bond-Hay Treaty, Newfoundland again restricted the sale of bait to Americans. The colony's Foreign Vessels Fishing Act of 1905 provided for forfeiture of U.S. vessels using Newfoundland bait or crews.

But restricting sales of bait was often difficult, just as it had been with the French. Fishermen of the south and west coasts, far from St. John's, had their own profits to think of. Some smuggling continued regardless. Also the Americans caught their own bait when they could.

Still the restrictions held enough strength to irritate the Americans, who took up the issue with

Great Britain. The whole fuss ended in another *modus vivendi* in 1906, which let the Americans use purse-seines on the Treaty Shore to catch bait, and let them employ Newfoundlanders for fishing outside three miles.

The *modus vivendi* inspired new protests in Newfoundland. Great Britain and the United States finally submitted the whole question of American fishing to the Hague Tribunal, whose judgment in 1910 affirmed in large part Newfoundland's rights to regulate U.S. fishing and control the sale of bait.

LOBSTER DISPUTE WITH THE FRENCH

The lobster fishery caused another complicated clash. Newfoundland settlers began developing a lobster fishery around 1880. But so did French operators. And both wanted to use the French Shore in western Newfoundland.

The Treaty of Utrecht, in 1713, recognized British sovereignty in Newfoundland. The French had no rights of settlement. But they still claimed exclusive fishing rights on the French Shore. The French now contended that the same rights that let them dry cod should let them can lobster.

Newfoundlanders were pressing westward. They began setting up factories on the French Shore. The French protested; and in 1887, a French warship destroyed some property.

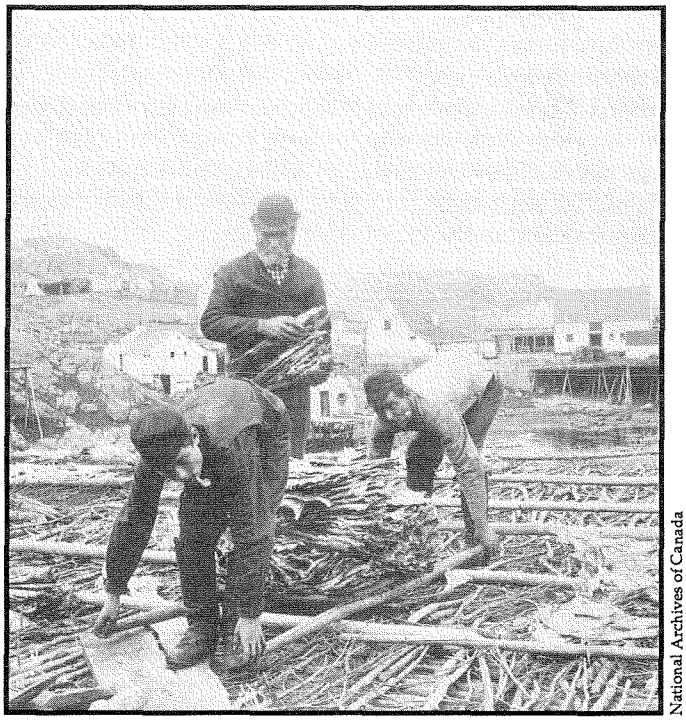
Charges and counter-charges followed. Newfoundland protested against the French lobster factories. The French complained about Newfoundlanders encroaching with cod traps.

In 1889, Newfoundland outlawed cod traps on the French Shore. A modus vivendi gave each lobster packer, French or British, a specified strip of coast, under the command of French or British commodores. British lobster factories increased to 59 by 1887. The French had less growth. In 1894, they had 14 stations with 15 vessels and 649 men. The rule in the 1890's was no new factories without mutual consent. The lobster situation remained an uneasy stalemate.

NEWFOUNDLAND WINS MORE CONTROL

By 1904, Britain and France were moving into the "Entente Cordiale". As part of the settlement of differences, they agreed that France would abandon her claims to exclusive use of the French Shore, which ran up the whole west coast and back down the northeast coast as far as Cape St. John.

This opened territory in a clear manner for settlement. The French lobster factories vanished. Newfoundlanders took over.



National Archives of Canada

Cod drying on the flakes, Newfoundland, circa 1886.

Britain made a monetary settlement with France, but also agreed that France would have rights to an equal summer fishery. Modified by subsequent treaties, French fishing rights still continue in Canadian waters.

The Newfoundland authorities continued to worry about smuggling of bait to St. Pierre and Miquelon, and railed against Canada for allowing the overt sale of bait. But in following years the French question faded away. In the dried-fish fishery, the number of French schooners working out of St. Pierre on local banks and shores dropped from 151 in 1904 to only one in wartime 1915.

Still, St. Pierre's own locally-based fishery continued; and the French wet-salted fishery on the Grand Banks, which had 226 vessels in 1904, continued in a fairly steady fashion until World War II.

LOCAL MANAGEMENT ONLY BEGINNING

Although vigorous in international matters, Newfoundland was only beginning to address conservation itself. Newfoundlanders had made scattered attempts at regulation from the days of John Guy. But unlike the Maritimes, the oldest colony had built up relatively few local fishery regulations over the years. Local government barely existed; and this colony that depended totally on fishing still in the 1880's had no

fisheries department.

In the 1880's the colony passed some conservation regulations such as mesh size restrictions. In 1890, the government set up the Newfoundland Fisheries Commission, and hired a Norwegian expert, Adolph Neilsen, to take charge of matters. In 1898, the Commission became the Department of Marine and Fisheries. Around 1902, the authorities created a Newfoundland Fisheries Board, attached to the Department, which acted as an advisory council.

Newfoundland began subsidizing the refrigerated (by ice and salt) storage of bait, the first such operation starting in 1893 at Burin. But the fishermen failed to keep up the operations. In other development work, the Department distributed directions for curing and packing herring, and making cod-liver oil.

LITTLE GROUNDFISH REGULATION

In the groundfish fishery, regulations seeking to avoid gear conflicts prohibited cod traps in certain areas.

Despite problems in cod markets, new use of the Norwegian method of making cod liver oil had brought some additional value. The government tried to encourage better quality in making salt cod.

There were scattered new developments in the industry -as noted earlier, the cod trap was rapidly replacing cod seines. By 1870, the Job Brothers concern in Newfoundland was producing fertilizer at Bay Bulls, Catalina, and Lance-au-Loup. The company built two small steamers to collect material.

At least one company experimented with trawling at the turn of the century. Gas engines appeared in Newfoundland around 1910. By 1914, an estimated 4,000 Newfoundland fishermen used gas engines, bought mainly from Canada.

SALMON AND HERRING

The Newfoundland Fisheries Department concerned itself, like the early Canadian department, largely with river and inshore conservation: prevention of illegal netting, provision of fishways, and such. Nets were ruining the Gander River salmon, officials noted in 1902. Instead of trying to make up for it with expensive hatcheries, they said, one might do better to assist nature by letting the fish run freely. The Department installed the first fish ladders in 1904, decades behind Canada.

Around 1900, Newfoundland interests began exporting fresh salmon to the U.S., as Maritimers had done for some decades. On the Labrador, Newfoundland schoonermen would simply break ice off the icebergs to pack them. Fresh salmon gradually replaced the old trade in pickled salmon. The Department restricted the use of nets in salmon rivers.

Newfoundlanders were already salting herring for export. The Newfoundland government encouraged the use of herring for food, importing Scotch packers in 1898-99 to demonstrate the cure of herring. Some herring were packed following the superior Scotch cure; but as the governor of the day noted, the "industry does not seem to increase".

Americans and Canadians continued to buy frozen herring to take back to their own shores, for bait or food. By 1898, in Placentia Bay, two to three thousand Newfoundlanders would sell herring to the foreign vessels, with hundreds more fishing at Bay St. George. To improve returns, the government set a minimum price of $1.25 per barrel. This was probably the earliest instance of a Canadian or Newfoundland government setting a minimum price for any fishery product. In future years, Newfoundland governments would many times intervene in the marketplace.

Then as now, the Newfoundland herring business was an up-and-down affair. Early in the century, it seemed to have disappeared at Labrador. At Fortune, it was said that gurry had ruined the grounds.

LOBSTER BOOM AND BUST

In Newfoundland, lobster canning first took place in 1858. In 1879 came the first live lobster exports; although Newfoundland exported live lobsters in quantity only beginning in 1928.

Besides spears, hooks, and gaffs, Newfoundland fishermen at first used the hand trap: a circular hoop with a net, that the fisherman guided by hand. Newfoundland forbade hand traps between 1905 and 1910, by which time regular traps had come into use.

Lobster was dirt cheap. Newfoundland fishermen in the early fishery received 70-80 cents per 100 pounds. Some fishermen on the west coast of Newfoundland in the 1880's were too poor to buy nets.

In 1890, Newfoundland set a size limit for lobsters. The fishermen largely disregarded it. The government also set closed seasons, which went through later adjustments, and forbade the use of berried lobsters.

By 1898, Newfoundland had 1,020 lobster "factories", most of course very small, even one-man operations. The colony set up 70 lobster hatcheries, which must also have been tiny operations. In 1890, a regulation granted authority to require fishermen to bring "berried" (egg-bearing lobsters) to the hatcheries, so the government could incubate and release them. This attempt at re-planting the harvest continued for years, fading away in the early 1920's.

By 1900, the colony had 1,400 lobster factories, and by 1913, an amazing 2,762, but they put up an average of only six cases each. Lobster size too, was decreasing. The Newfoundland Department now had only three lobster hatcheries, and officials were questioning their value. As years went by, lobster became so scarce that the authorities shut down the fishery for three years in the 1920's.

WHALING IN NEWFOUNDLAND AND CANADA

If Newfoundland's industry lagged behind the none-too-strong Canadian industry in most ways, still it led Canada in the development of whaling, which enjoyed a brief boom.

In Canada, natives on the Pacific and in the Gulf of St. Lawrence had hunted whales; as had, of course, the early Europeans on the Atlantic. By the 1840's, American or European whalers had fished off both Canadian coasts and in their Arctic reaches.

In Canada itself, a small whaling industry had existed in the early 1870's in British Columbia. On the St. Lawrence estuary, a subsistence fishery for white whales, using weirs, dated back to New France; and Gaspé-based schooners had long taken whales of various types, up until the 1890's. In Newfoundland, there appears to have been little whaling in the 19th century until the 1890's.

In Norway, whales were depleted by the turn of the century. But the Norwegian Adolph Neilsen, Newfoundland's superintendent of fisheries, in the late 1890's got some of his countrymen interested in whaling at Newfoundland. Although Norwegians on Norwegian-built boats did most of the early Newfoundland whaling, British-American capital also moved in, and British subjects manned the factories.

Tonnessen's history of whaling recounts the story of an 83-foot blue whale that when harpooned off Newfoundland towed the 545-ton whaling vessel at two miles per hour, in and out among icebergs, from 7 p.m. to midnight, against the vessel's engine running half-open in reverse. It took the whalers ten and a half more hours to kill the whale. Another whale towed the vessel Puma in reverse, nearly pulling her stern under, against the steamer's engine running full ahead. This whale took 27 hours to kill.

Perhaps everyone is a Captain Ahab. Commander Wakeham, an officer with the Canadian department, wrote of the blood frenzy of American whaling and walrus-hunting crews in Hudson Bay.

In another story from the early years of the century, men at St. Mary's Bay in Newfoundland were carrying an old lady's coffin along the landwash to the cemetery for her funeral, when small whales struck in. The men attacked them with axes and whatever they could find, until finally someone noticed the lady's coffin floating away on the tide.

From 1898 to 1911, about 20 whaling stations started up in Newfoundland. In 1904 the whalers took 1,275 whales. But by 1914, scarcity had closed most factories. A factory at Rose-au-rue, operated by the Newfoundland Steam whaling Company, lasted to 1946. Another at Hawke's Harbour lasted to 1951, and revived briefly in 1956-59. In the 1960's, a small revival saw two factories operate in Newfoundland.

The decline early in the century happened despite seemingly strict Newfoundland laws. The Whaling Industry Act of April 22, 1902, issued permits for a limited time only, and also controlled the number of boats. But Tonnessen points out that the law set no limits on the fishing season or the number of whales; and despite Inspector Neilsen's warnings in 1903, the government issued more permits. It seems a story of limited entry applied too loosely.

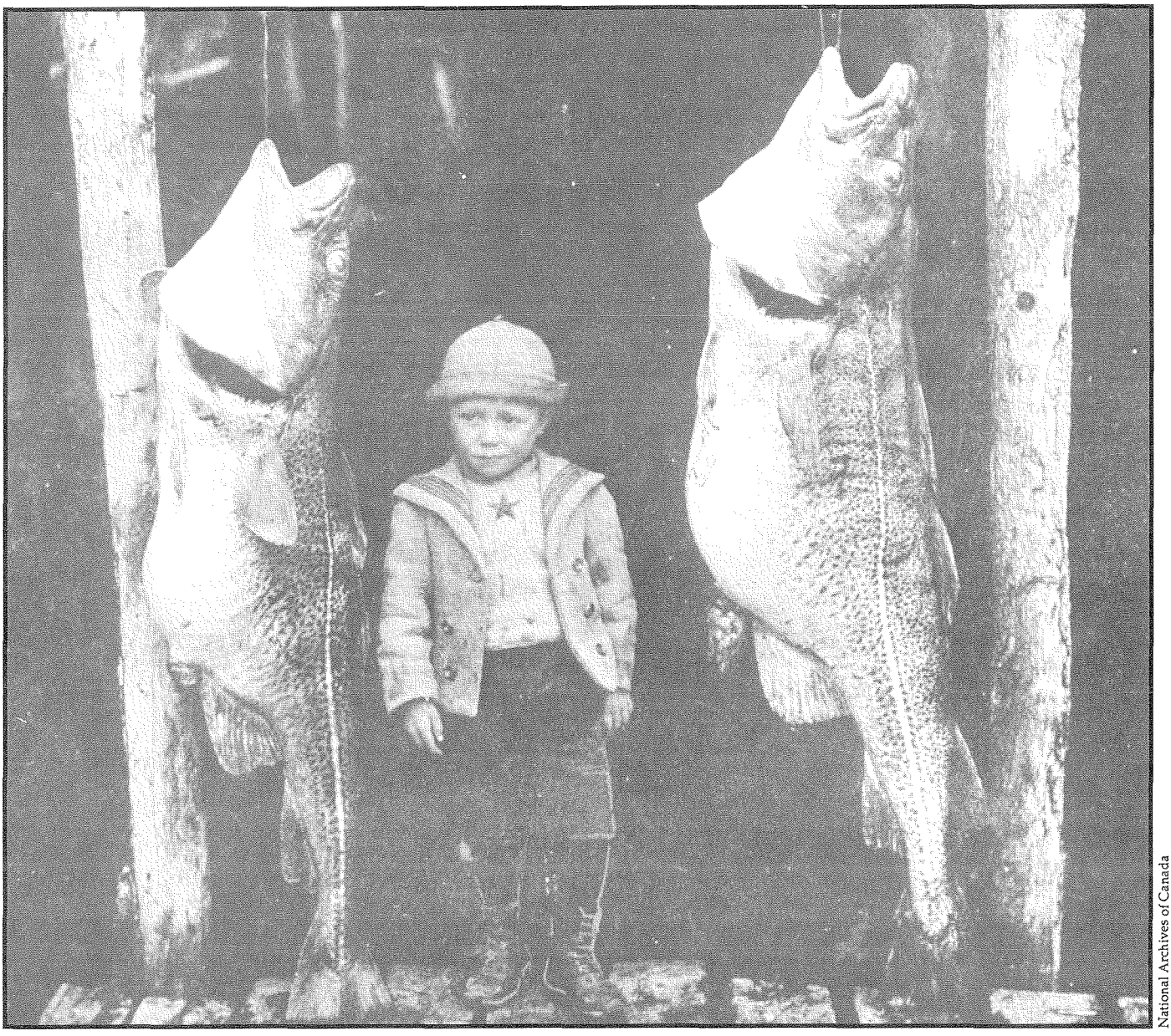
The government also gave some assistance to the seal fishery. A bounty in 1898 helped 19 steamers take 242,000 seals.

STAGNATION IN THE FISHERY

The laudable efforts of Commission and Department failed to change the general gray picture of the fishery. At the end of the 1880-1910 period, Newfoundland was showing even less dynamism than Atlantic Canada. The cod trap had spread; and the bank fishery had grown. But Newfoundland turned more slowly than Americans and Nova Scotians to the banks, showed little interest in trawlers, had less luck in developing new species, was too far from market to develop much of a fresh-fish trade, and was altogether more on the fringes of things, despite her abundance of cod. Even Canadian and American fishing captains were losing interest in Newfoundland.

The fishery at the turn of the century relied on handlines, on longline, on cod traps, on gillnets (very few), and on cod seines (fast declining). After the Bowring firm's unsuccessful trawling experiment in 1899, nobody else used trawlers until the mid-1920's, instead complaining about French trawlers. Gas engines appeared in Newfoundland by 1910. By 1914, an estimated 4,000 Newfoundland fishermen used gas engines, bought mainly from Canada.

The shore fishery included those who fished from one location only (their own village or another spot on the coast), and those who moved from place to place during the season. The person who set up his fishing rooms, stages, etc. in a particular spot away



National Archives of Canada

Big cod fish from the trap at Battle Harbour, Labrador. The larger fish measured five feet five inches, and weighed 60 pounds. From R. E. Holloway's 1910 book, "Through Newfoundland with the Camera".

from home was a "stationer." He and his partners might move to their location in spring by motor boat, schooner, or coastal steamer, frequently with his family. The schooner fishermen who kept moving along the coast during the season were floaters. Both stationers and floaters returned to shore daily. The Labrador floater fishery in the decades 1890-1910 reached its high point; in one season, more than 1,400 vessels took part.

The bank fishery did grow stronger in the period 1880-1910. This fishery took place mainly on banks south and east of the island of Newfoundland. The bank fleet in 1901 had 118 vessels, with Grand Bank the main port. Americans, Canadians, and French also took part. The 1937 Commission of Enquiry on Newfoundland fisheries noted that only Fortune Bay and Placentia Bay had banking fleets, "those areas being nearest to the Grand Banks, where conditions are most suitable. The largest vessels go as far as Labrador and Straits of Belle Isle to fish during the months of September and October, and in recent years, some have gone as far North as Greenland."

NEWFOUNDLAND PRODUCES A PROPHET

Scattered in many different fisheries, Maritime fishermen remained unorganized. In Newfoundland, the industry was scattered as in the Maritimes; but almost everyone fished cod and faced similar circumstances. Thus there was better potential for organization. And Newfoundland had a prophet.

Born in 1871, St. John's native William Coaker as a young man tried his hand at organizing telegraphers. In the early 1900's, the fishery situation worsened; and in 1908, a large catch of cod and chaotic marketing saw the price fall to half the previous year's. The colony fell into another economic depression. Coaker began to organize the Fishermen's Protective Union. The organization spread like lightning on the northeast coast. Coaker held out the promise of more power and benefits for fishermen and of a better, stronger industry, through fishery reforms. The FPU reached its peak after World War I, in a gallant attempt that ultimately failed to change the Newfoundland fishery, but which prefigured future directions.

Fresh Water

Again and again, freshwater fisheries have shown how easily fishermen and society in general can damage a fishery. Fisheries in rivers, the Great Lakes, and the prairie provinces have been pioneers of problems. Managers tinkered with many solutions, usually failing. And whatever lessons these fisheries have had to teach, the much bigger sea fisheries have usually ignored.

PROVINCES CLAIM RIVER RIGHTS

River species of concern in the 1890's included sturgeon - the Department set regulations in 1891 - and bass; the Department in 1892 forbade catching bass on the St. John River, to save them from "utter ruin". The Department also passed regulations restricting hoop nets, often used in rivers.

The new sturgeon fishery was beginning to fall off by 1897. Fishery officers protested the use of longlines for sturgeon. Over the next couple of decades, the sturgeon fishery declined to near insignificance.

Salmon was the river species of prime interest. And salmon, the indirect creator of much of the great power of the federal Fisheries Act, also prompted the first major weakening of federal control.

The British North America Act had given the Dominion clear power over "Sea Coast and Inland Fisheries," and the Department had done as it pleased with all fisheries.

But the provinces were beginning to assert their powers in many spheres. By the 1880's, Sir John A. Macdonald no longer dared to blithely disallow provincial laws. In following decades a long series of legal cases, judged by the Judicial Committee of the Privy Council in Britain, chipped away at the power of the central government. Judgments tended to stress the provincial powers over property and civil rights.

The federal fisheries powers were an early target. The first big crack in federal jurisdiction came in the case of the Queen vs. Robertson in 1882, involving salmon-stream leases in New Brunswick.

Canada's Supreme Court decided that although the Dominion government could legislate in regard to all fisheries, it had no power to interfere with, control, or grant exclusive fishery leases in any non-navigable rivers. The public right of fishing extended only to tidal waters. In the non-tidal waters, it made no difference whether the river-bed or soil belonged to the Crown in right of a province, or to a private owner holding a title from the Crown; still the federal government had no power of leasing. Witcher circulated a letter to holders of federal lease, telling them the situation had changed.

This loss of federal power complicated salmon management, especially in New Brunswick. To a degree, the fishery now had two masters.

FEDERAL JURISDICTION FURTHER WEAKENS

Provinces seem to have claimed more fishery powers partly for its own sake, partly because they hoped to gain revenue through licence fees.

By 1891, various provinces had passed acts affecting the fisheries. In 1892, Quebec questioned federal rights over inland fisheries, in particular a lease granted on the Richelieu River. In 1894, Ontario passed a code of fishery regulations. In 1897, British Columbia did the same. The question of who controlled what caused a referral to the courts. This brought about an 1898 judgment by the Judicial Committee of the Imperial Privy Council that split authority over Canada's fisheries.

The judgment confirmed that the federal government had exclusive competence to enact fishery regulations and restrictions, and the right to impose "a tax by way of license as a condition of the right to fish."

But, the provinces had all proprietary rights in respect of fisheries which they held before Confederation, when ownership of river banks often went together with fishing rights. The provincial government could also tax provincial fisheries in addition to any tax imposed by the Dominion Parliament.

Following on "The Queen vs. Robertson" of 1882, this confirmed the federal loss, for river fisheries, of the licensing power that seemed so important to Whitcher.

With it went other authority. After the 1898 judgment, the government of Ontario took over licensing, leasing, protection of fisheries, and hatcheries in that province. Quebec did the same except for the sea fisheries. Other provinces continued as before, except that British Columbia began asserting more power over inland fisheries.

Because the federal government still held the ultimate responsibility for fishery regulation, the two levels of government adopted the system that still prevails. Where a province administers the fishery, it recommends regulations to the federal government. The federal government normally enacts them as recommended, and the province enforces them.

The 1898 judgment also said that the federal government could tax provincially-issued licenses. It confirmed that the federal government owned public harbours and their fisheries. And a further decision in 1899 said that Canada could regulate on the fisheries in such a way as to affect provincial rights of ownership, even though the province retained ownership.

Like Sir John A. Macdonald at Confederation, the Department had basked in great powers, only to suffer a provincial counter-attack that was to last for decades, and still continues sporadically.

END OF THE GREAT LAKES SALMON

Almost from the time of Confederation, annual reports had been praising the work of hatcheries and especially of Samuel Wilmot, Superintendent of Fish Culture from 1876 to 1895. Hatcheries on Wilmot's model spread from his Ontario farm across North America. Notwithstanding hatchery efforts, by the early 1880's Atlantic salmon had vanished from Lake Ontario, including those from Wilmot Creek, once so plentiful that women seined them with their flannel petticoats.

Environmental changes far outweighed any

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Dumping fry from the Point Edward Hatchery in a lake, Point Edward, Ontario, 25 April, 1911. Photo: John Boyd.

benefits from the hatcheries. Deforestation, loss of food from the riverbanks, silting, lower water levels, and higher temperatures resulting from dams, all conspired to kill the salmon.

Whitcher had seen it coming. Although he encouraged hatcheries to compensate for other losses, he saw their limits. In 1874 he wrote that:

> *... while it is true that fifty or sixty years ago, almost all the considerable streams in Ontario, Nova Scotia, New Brunswick, and parts of Quebec were resorted to by anadromous fisheres, it is also true that the conditions of many of them have undergone a total change. The forest has been cleared along their banks and thinned out to such an extent even to their head waters, that the snows of winter and the rains of summer are much more rapidly evaporated, and what were once full streams flowing through virgin forests, are now, in the hot season, mere rivulets meandering through meadows and cultivated fields. The once secluded spawning beds are now crossed and recrossed by herds of grazing cattle, and often for miles but a mere thread of water trickles over the bars and gravel beds. While the settlement of the country has produced these changes in our rivers, the erection of mills and dams on most of them, and the prosecution of lumbering operations on all of them, have worked still greater changes. Most of these dams were erected many years ago, before any laws were enacted for the preservation of fish, and the consequence is, that a very large number of the smaller rivers have been deserted by their finny denizens, and it is very doubtful whether, under these altered circumstances, they can ever be restored, even were the costly experiment of restocking them by artificial culture tried.*

Whitcher advised caution in selecting streams for any such effort.

OVERFISHING IN ONTARIO

As new settlers poured into the Great Lakes region during the 19th century, a beach seine fishery for whitefish developed as early as 1807 on Lake Ontario. The year 1815 saw seine nets on Lake Erie. By mid-century, fishermen were using gillnets and also the pound-net: a fixed enclosure of nets on stakes near the shore. It kept the fish alive, an advantage for marketing. As elsewhere, beach seines gradually faded away as the original abundance got fished down.

With many fishermen living close to market,

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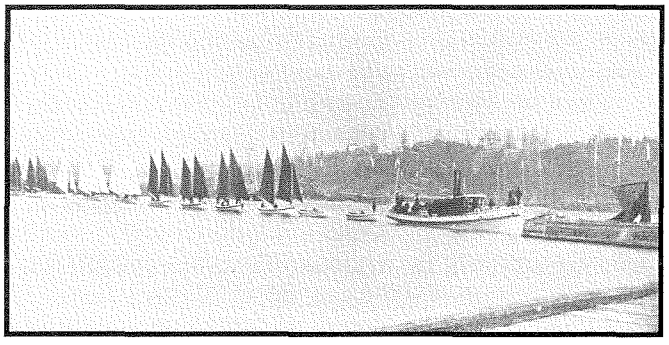

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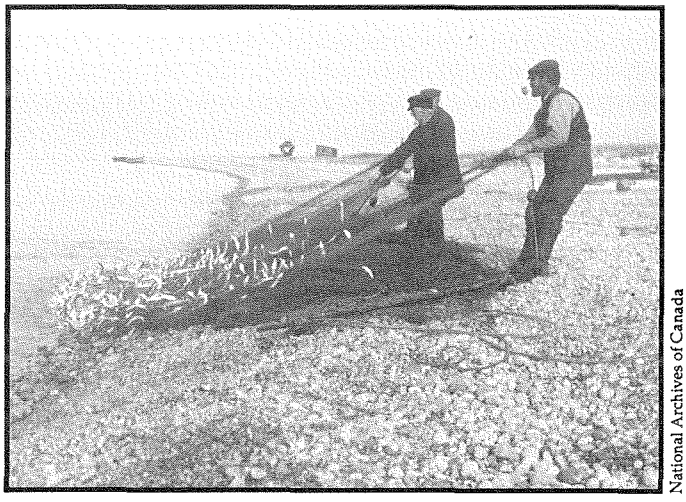

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Fresh fish in boxes on the Bay of Quinte in Ontario (top). Boxing fish became common on the Atlantic only in the 1980's.
Fishing fleet in Goderich, Ontario, 1884 (centre). Steam tugs in the late 1800's often towed sailing craft to market.
Nets on the shore full of fish, 1907 (bottom).

Lakes Erie and Ontario led Canada in developing a strong fresh-fish industry. Train and steamship service from the 1850's boosted the fresh trade. Smaller operations first dominated the fishery. But as A. B. McCullough has outlined, better technology in the last quarter of the century - steam tugs, more nets - needed bigger money. Several larger firms emerged, some passing into American hands.

The Chicago-based Booth Packing Company dominated the Lake Superior industry by the turn of the century, and became a major force on the Upper Lakes and Lake Ontario. The smaller independents fared best on Lake Erie, where they were close to both fish and market.

In the last quarter of the century, concern about freshwater species led to great alarm about the pound-net. The Annual Report of 1891 lamented that, "Fishing from morning till night and from night till morning, in season and out of season, and all through every season, for all kinds or sizes of fish, it abates not its ravages for any cause but exhaustion."

The report noted that, although the pound-net had depleted many fisheries in the northeastern U.S. and Great Lakes, Canada had to permit some so that her fishermen could compete with American fishermen.

The Department experimented with escapes for smaller fish, restricted the number of pound-nets per fishermen, and set close times for pound nets. Despite all the alarm, pound-nets lingered on; some still exist on the Great Lakes.

In 1893-1984, a commission on the Ontario fisheries brought about new closed seasons. It also recommended changing mesh size back to 5" from 4", recommended regulations for pound nets and their meshes, proposed spawning sanctuaries, and waxed eloquent on the causes of depletion including sawlog damage.

But depletion continued, under the federal government and the Ontario government after it. By the time Prince and his federal colleagues were in their hey-day of regulation-making, Ontario had taken firm control of the fisheries. No one can say if the federal authorities would have done better. But clearly, the Ontario authorities did poorly.

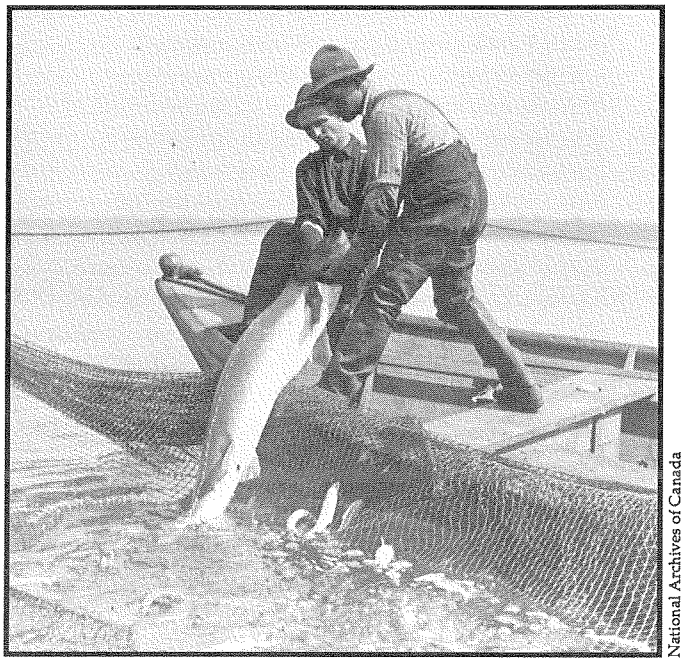
"No words can exaggerate the former plenitude" of the Georgian Bay fisheries, said the federal Department's Annual Report of 1908. Whitefish had declined; less desirable "coarse fish" had increased. The provincial and federal authorities restricted both trap nets and seines. But nothing availed. The Great Lakes were well launched into a pattern of overfishing desirable species, to be replaced by other, less valuable fish.

By the early 20th century, Ontario fishermen regularly used motor-powered gillnet boats. They had begun to use extra deep gillnets, or bullnets, to catch lake herring. Lake Erie was always the most important lake, sometimes equalling the production of the other Great Lakes combined.

Whitefish catches dropped, with overfishing and environmental degradation the likely culprits. As whitefish declined in Lake Erie, herring took over - an early example of a less valuable species moving into a vacant ecological niche. Even if dollar value dropped, total production could remain fairly stable.

But catches of lake herring themselves crashed in the 1920's, probably because of a too-intensive fishery.

Sturgeon, once considered a nuisance and used for fertilizer, had become scarce by 1900. Dams hastened the decline of this river-spawning species.



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Lifting sturgeon out of net, 6 August, 1909.

Lake trout also became scarce by the turn of the century.

Sauger commenced a slow decline after 1916, again apparently because of overfishing and environmental losses.

Blue pike landings began to fluctuate extensively by 1915, probably because of heavy fishing.

As other species declined, walleye and yellow perch began taking on more and more importance.

By the end of World War I, the pattern was set for Great Lakes fisheries of the future. J. H. Leach and S. J. Nepszy of the Ontario Ministry of Natural Re-

sources in the 1970's summed up changes in the Great Lakes fishery thus:

> *"The dominant and most consistent cultural stress acting on the [fish] community has been the commercial fishery. All species important to man have been affected. Throughout its history the commercial fishery of Lake Erie has been inadequately regulated.... The progressive exploitation of stocks in a multi-species fishery has been described by Regier and Loftus ... as the 'fishing-up' sequence. Basically, this process is described as the gradual shift in fishing effort from higher-valued to lower-valued species as the preferred stocks pass their peaks and decline in abundance. It encompasses the ability of fishermen to increase fishing efficiencies through improved gear, more and larger vessels and a growing knowledge of the behavior of fish. This process began in Lake Erie in the 1800's and is still continuing."*

BEGINNINGS OF THE PRAIRIE FISHERY

Inland on the prairies, a commercial fishing station started up in 1872 to supply Winnipeg but failed. Another, beginning in 1883, managed to survive. The railway reached Winnipeg in 1885. The city began to grow in a headlong rush. A gillnet fishery developed on Lake Winnipeg and soon began exporting. The Prairie fishery grew from a value of $30,600 in 1876 to $745,500 in 1896. White entrepreneurs often used native fishermen for labour.

The Fisheries Act came into effect for Manitoba on 1 October 1880. In 1884, the Department appointed an Inspector at Winnipeg and an overseer for the Qu'appelle district. After Wilmot reported on Lake Winnipeg and Manitoba, the Department in 1891 set up a proper organization and passed initial regulations for Manitoba and the Northwest Territories.

As in British Columbia, conflicts emerged between the Indians and the new fishery managers. There were reports of some Indians defying the closed seasons and selling illegally caught fish to traders.

The industry also produced caviar and goldeyes, along with "coarse fish".

As whitefish got scarcer, fears grew of over-exploiting the Lake Winnipeg fishery. In 1892, the Department restricted fishing to the northern part of the lake, and ordered that no company could fish more than 20,000 yards of net. This in effect limited each company to less than 20 boats. The department was limiting the amount of effort per company, without limiting the number of companies.

In 1894, on April 14, an Order-in-Council prohibited tugs -that is, vessels with motor power, often used for towing sailboats or skiffs to the dock - except in shipping. New rules were again fighting new technology, only to give way over time.

A Royal Commission in 1909-10 noted the depletion in Lake Winnipeg. Prince and the other Commissioners drew up rules to:

- abolish the steam tug licence belonging to the Commercial Company, "the object being to remove all control by commercial companies or combines, and to place the fisheries, as far as possible, in the hands of the bona fide fishermen."
- delimit the area to be fished in summer;
- gradually increase mesh size in the whitefish fishery, to raise the age of capture;
- reduce the amount of nets and gear to be used by tugs (regulations already confined fishermen to baited hooks and gillnets only);
- limit the total annual summer catch of whitefish.

This latter provision was probably the first systematic use of quotas in Canadian fisheries.

The commissioners also worried about the marketing system, and made complaints that stayed common in the prairie fishery for decades to come. American buyers were exercising undue powers and using shady practices in the marketplace. The commissioners suggested measures to ensure fair supplies to Canadian retailers. About another recurring problem, common all over the Dominion, the commissioners had

Overall production doubled from 10.7 million pounds in 1900 to 20.5 million pounds in 1909. This table shows production (in pounds) for major species in Manitoba.

Species	1895	1900	1905	1909
Whitefish	4,270,319	5,872,400	8,005,000	4,662,100
Pickerel	931,190	2,275,100	6,900,000	5,750,400
Pike	689,395	444,300	3,790,000	3,067,100
Sturgeon	104,240	981,500	600,000	94,300
Tullibee	278,800	204,200	2,074,000	834,200
Catfish	79,724	184,400	500,000	87,200

this to say:

"Requests for extensions of fishing times are sent to Ottawa and urged with great force, owing, in some cases, to a serious shortage in the season's catch of fish. ... To this commission it appears strange that, during a season in which the fish appear ... to be especially scarce, requests should be made for an increased destruction of them. ... In our opinion, when the fish ... appear to be scarce, that is precisely the time that they should be conserved."

The prairie regulations were in some ways well in advance of the sea fisheries. In later decades as well, after the prairie provinces were delegated responsibility for fishery management, they were first with such measures as individual quotas. But often, regulations that sounded strong and good turned weak in the application.

The Pacific

British Columbia's great salmon rivers supported only a small commercial industry, for salted and barreled salmon, until the tin can came along. In the 1860, canneries started up in California and the American northwest. In 1870, four partners - Messrs. Hennessy, Loggie, Ewen, and Wise - built British Columbia's first salmon cannery at Annieville, just below New Westminster on the Fraser River.

By 1880, the Fraser River in southern B.C. had eight plants, the Skeena and Nass in the north had three, and Alert Bay had one. Fishermen with rowboats and small sailboats used gillnets on the rivers. The plants used the laborious techniques common to lobster and sardine canneries.

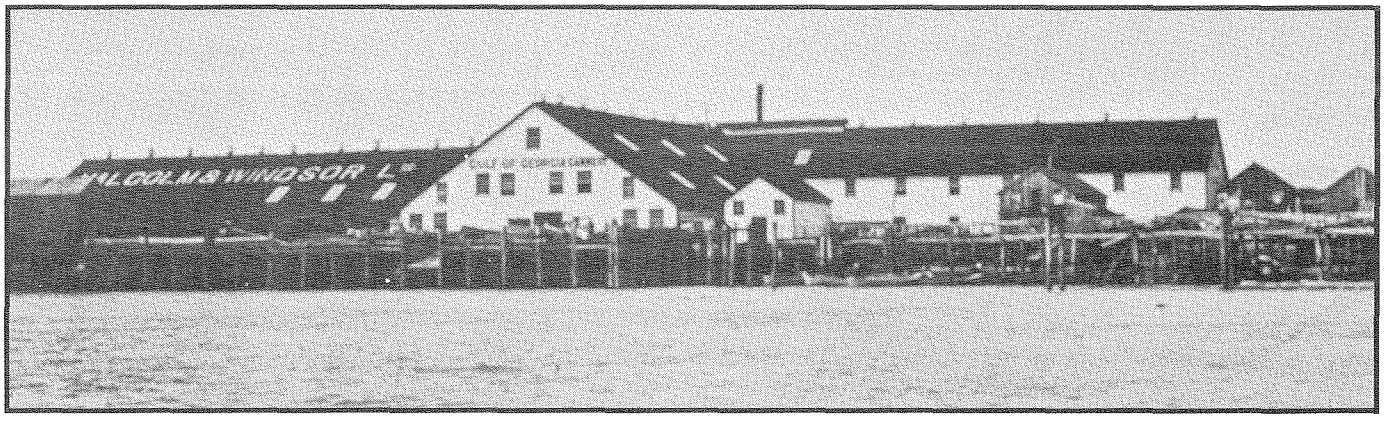
British Columbians in the 1870's also began fishing herring and whales.

The transcontinental railway completed in 1886 boosted the B.C. canning trade, and created a new fresh-fish trade. Cold-storage plants went up on the Fraser. New immigrants from China and Japan, together with the native Indians, provided much of the labour to build and run canneries. Steveston in particular, at the mouth of the Fraser south of Vancouver, retains a strong Japanese influence.

The number of salmon factories nearly quintupled from 12 in 1881 to 59 in 1889. Attention switched from red spring salmon to sockeye. On Vancouver's Burrard Inlet, one entrepreneur in 1883 started up a mobile cannery and oil factory, known as Spratt's Ark, a venture that lasted only two years. Canneries spread to every part of the coast, bringing settlement to such isolated areas as Rivers Inlet and Smith's Inlet.

From 1890 to 1899, the number of salmon canneries nearly doubled again, from 32 to 59. From 1890 to 1896, production of canned salmon ranged around 500,000 or 600,000 cases a year. It jumped to 1,000,000 in 1897, but fell to 480,000 in 1898 and 732,000 in 1899. The stocks were no longer virgin. Although higher packs became common in later years, this was largely because the industry supplemented its catches of sockeye, coho, and chinook by using more of the lower-value pink and chum salmon. The first shipment of cured chum salmon went to Japan in 1897.

Commercial freezing of salmon began on the Columbia in 1892, and moved up the coast. By then, mechanical fillers for salmon cans had come into use. Electricity aided the industry. Mechanization took another big step with machinery that could seal cans without soldering, and that could butcher salmon. The Smith Butchering Machine came on the market in 1905.



Exterior of a British Columbia salmon cannery, from the 1909-10 Annual Report.

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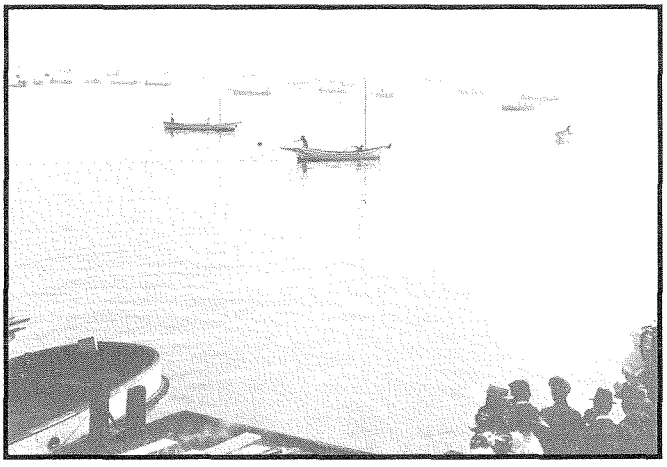

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Fraser River salmon fleet, 1900 (top).
Fifteen hundred fishing boats at twilight at Steveston, near Vancouver, British Columbia (bottom).

Its nickname, the "Iron Chink", bears witness to the prevalence of Chinese workers in the factories, often hired on a group basis by Chinese contractors. In a back-handed way, the machine's name testifies to Chinese energy and efficiency.

Fishing boats on the Fraser became bigger, as competition for fish pushed them more towards the Fraser mouth. The Fraser skiff gave way to round-bottomed boats. As on the east coast and the lakes, towards the end of the century steam-powered tugs towed boats to the factories. The gas engine changed all that, as small boats got their own power. By the time of World War I, the bulk of the Fraser fleet had engines.

THE FIRST B.C. FISHERY OFFICERS

On May 8, 1876 the government of Canada extended the Fisheries Act to British Columbia. For the time being, the government exempted the Indian fishery from regulation.

James Cooper had served as the federal government's Fisheries Agent from 1871 to 1876. The British Columbia pioneer and writer Alexander Caulfield Anderson now became Fishery Overseer from 1877 until 1882. The title of the top job then changed to Inspector, a post filled by George Pittendreigh until 1886. Thomas Mowat took over from 1886 until 1891, John McNab 1891-1900, and C.B. Sword, 1900-1911.

Thomas Mowat is one of those whose character shines from the dusty pages of the department's annual reports. His coastal and offshore fishing expeditions, "prospecting for fish" as he called it, constitute the department's first exploratory fishing. He encouraged ventures by others, and in particular helped get a black cod fishery going at the Queen Charlottes. Mowat also tried transplanting lobster in 1888, at the aptly named Cape Disappointment. (Eight decades later, the fisheries department tried an equally unsuccessful transplant at Useless Inlet.)

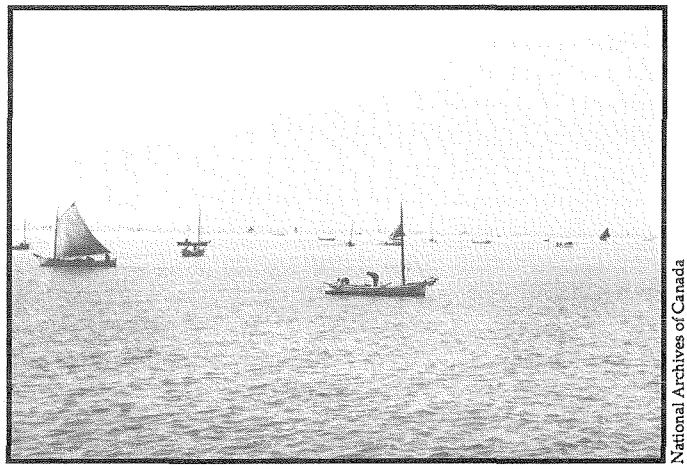
The main federal development effort was, of course, the hatcheries. By 1910 they numbered eight in British Columbia. The fisheries service divided the coast into districts, and collected fees by district. The district supervisors had by 1910 earned a good deal of respect. Some made the most of it, lording it over the Indian paddlers who took them on annual upriver trips to check habitat and spawning grounds.

After the 1898 Imperial Privy Council judgment on fisheries, British Columbia took a bigger role in fishery management. John Pease Babcock, B.C. Deputy Commissioner of Fisheries, took a strong interest in questions of biology and management. Today the province administers sport fishing in non-tidal waters, except for anadromous (river-spawning, sea-dwelling) species. The salmon fishery remains under federal control.

THE FISHERY OFFICERS MEET THE INDIANS

Decimated by disease and dislocated by the white man, the Indians in B.C. clung to their fisheries. Indians sold some salmon for commercial use. The department's salmon regulations at first exempted the Indian fishery.

The Indians in turn, at least on one occasion, exempted the white man. In 1888, Inspector McNab reported that the chief on the Nass said he owned all the fish. The white fishermen would have to get licences from him. He would keep half the money collected. But, agreed the Chief, he would let it pass



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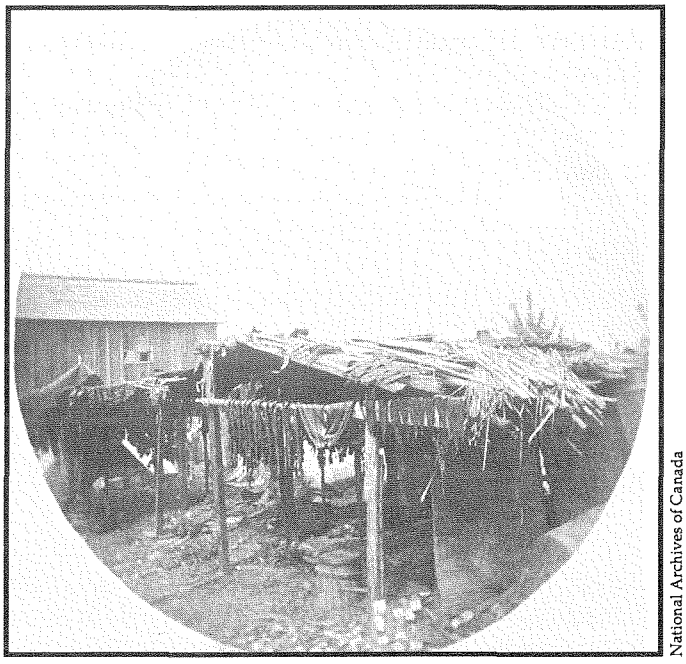
Indians salmon fishing, Fraser River at Steveston, British Columbia.

for this year.

Earlier Thomas Mowat ran into some trouble with Indians on the Skeena. At Masset on the Queen Charlotte Islands, the use of Indian constables helped to ease tensions.

Starting in 1889, the same law that provided for limited entry restricted the Indians. They could continue to fish without a licence, but only for food. The General Fishery Regulations stated that:

> *"1. Fishing by means of nets or other apparatus without leases or licenses from the Minister...is prohibited in all waters of the province of British Columbia. Provided always, that Indians shall at all times have liberty to fish for the purpose of providing food for themselves, but not for sale, barter or traffic, by any means other than with drift nets or speaking."*



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Drying salmon, Fraser River, British Columbia, circa 1889.

Notwithstanding the Indian liberty to fish, the Department in 1894 began requiring Indians to get permission before fishing. Further regulations in 1900 strengthened this requirement. Departmental permits now could fix the area and time of fishing activities, and the gear to be used.

The restriction on the Indian fishing created an uneasy situation on the coast that remains to this day.

THE FUR SEAL DISPUTE

With a patrol service and a set of rules, the Atlantic coast finally had international disputes fairly well in hand. Now the young Pacific fishery began developing its own quarrels. The major "Bering Sea dispute" started when Canadians encroached on what the Americans considered their own resource.

The land-based seal fishery at the Pribilof Island rookeries was America's first big benefit from the 1867 Alaska purchase. But in the 1880's, Americans from San Francisco and Canadians from Victoria began cutting into the crop. They undertook "pelagic sealing," taking from the same stocks but using schooners in the open water. By 1886, 20 Canadian schooners employed 79 seamen and 380 Indians. The Canadians launched the Indians in canoes for dare-devil ocean hunting. As fishery overseer Alexander C. Anderson described it in the 1880 annual report:

> *...It is only with the aid of the Indians of the West coast, expert in the management of canoes and habituated to this chase, that success is at present found to be attainable. These are hired upon shares, receiving one-third, I believe, of the produce of their chase or the equivalent in cash. Small schooners are equipped, on board of which the hunters are received, with their canoes, one of which is required for every two hunters. Lying-to off the banks the canoes, weather permitting, are speedily launched, and the seals, while sleeping on the surface, are cautiously approached. The spear only is employed, the head of which disengages itself from the shaft as soon as the prey is struck. To this barbed head a line is attached. If not killed outright the wounded victim is said to attack its pursuers with much ferocity, but a blow on the*

head from a club kept constantly in readiness soon terminates the unequal conflict. Of course accidents occasionally occur, and the whole scene is described as being very exciting to those who, from the deck of the attending schooner, watch the progress of the chase.

Although their own countrymen also did pelagic sealing, Americans blamed Canadian sealers for a decline in their harvest. In 1886, American revenue cutters seized three Canadian sealing vessels on the high seas.

British protests secured their release. But the Americans pressed Great Britain and other countries to agree to an international closed season. Canadians protested that the proposed limitations would destroy the main part of their season, and might imply exclusive American rights in the Bering Sea.

The Americans made new high-seas seizures in 1887 and 1889. Meanwhile, America's own pelagic sealers kept operating until prohibited in 1897.

U.S. authorities in the 1890's claimed sovereign control of a large part of the Bering Sea and North Pacific as part of the Alaska Territory, and forbade the killing of fur-bearing animals without permission. The United States seized Canadian sealers outside the three-mile zone, leading to Canadian seizures in retaliation.

In 1891 a British-American agreement closed the fishery to the Canadians pending arbitration. British and American cruisers expelled 41 vessels (averaging about 65 tons) from the Bering Sea. But in 1893 an international tribunal upheld the Canadian right to hunt seals in international waters, subject to some conservation restrictions. Congress delayed but finally paid $473,000 (U.S.) in compensation to Canadians for previous interference.

A minority of the Tribunal supported the idea of American property rights in the seals on the high seas, since they were conceived, born, and reared on American soil. Decades later in the 1970's, Canada used similar arguments when pressing unsuccessfully for a form of high-seas jurisdiction over salmon.

American interests kept opposing pelagic sealing, and the U.S. kept harassing Canadian vessels. But Canadians kept sealing. For example, the Victoria company sent 16 vessels north in 1908. A tortuous triangular dispute involving Canada, the U.S., and Great Britain dragged on. Meanwhile, seal stocks more and more showed the strain of over-exploitation.

In 1911 an international conference, with W.A. Found an advisor to the British plenipotentiaries, buried the lingering dispute. It was agreed that the U.S. alone would conduct the fur seal hunt, on land at the Pribilof Islands. But the other countries involved - Canada, Japan, and Russia - would receive a share of the proceeds. Canada got 15 percent. Canadian fishermen got compensation for previous losses. This simple arrangement has prevailed ever since.

THE A-B LINE

Another irritant had, by then, landed on Canadians. A controversial tribunal in 1903 awarded the United States its present territory in the Alaska Panhandle, running down the northwest coast of British Columbia. Part of the judgment set the so-called "A-B Line", running between two American points of land at the southern end of the Panhandle. Fishery disputes have occurred off and on since then, related to American claims to a territorial sea running off from the A-B line.

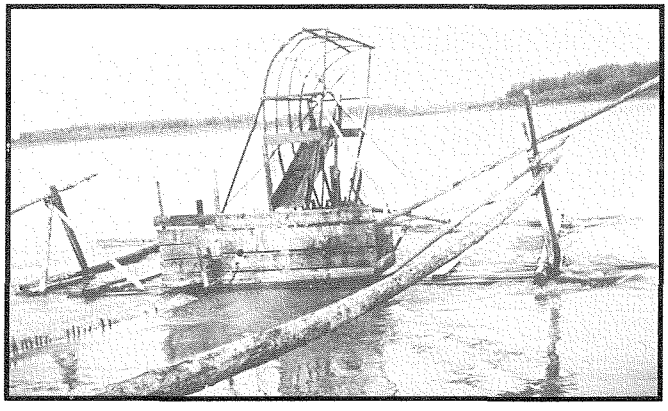
SALMON BRING STRONG REGULATION

In conservation itself, early officials in British Columbia set to work with a will.

On the U.S. side, fishwheels were doing great damage to the river fisheries. These near-perfect fishing devices looked like Ferris wheels. The downrushing water pushed the bottom baskets, which continually rose to scoop up fish and dump them automatically. Some fish-wheels were high as a house.

In British Columbia, as soon as the Fisheries Act came into force, the authorities got rid of fishwheels, pound nets, and traps on the Fraser, and set a weekly close time. The U.S. continued for many years with no such rule.

On May 30, 1878, an Order-in-Council prohibited drift nets except in tidal waters. Drifting could



National Archives of Canada

Although banned in British Columbia, some fishwheels persisted in the Yukon. The wheel turned centrifugally by the swift water catches fish, which drop into the chute, thence into the box. Photograph is circa 1948.

obstruct no more than one-third of the tidal waters of a river. No one could fish between 8:00 a.m. Saturday and midnight Sunday.

New rules in 1889 set the mesh size for salmon drift-nets, readjusted the weekly close time from 36 to 24 hours, and prohibited the use of seines in British Columbia (although seining seems to have continued in many areas under local dispensations).

LICENCE LIMITATION

The big clamp-down was on the number of boats on the Fraser River.

On the Atlantic, the department had licensed all fisheries almost since Confederation, without normally restricting the number of licences. In British Columbia, however, fishery managers moved quickly to limit the number of licences. Like Whitcher, they saw licensing as essential especially for salmon.

After an 1881 suggestion by fisheries overseer A.C. Anderson, the government began licensing canneries in 1882. First the fisheries service gave out licences with a free hand. But over-competition contributed to some cannery closures during the 1880's. And concern for the salmon was increasing.

In 1887, fishery guardian Chas. F. Green reported as many as 250 boats fishing in Canoe Pass on the lower Fraser. He suggested issuing only a limited number of licences, and allowing no cannery more than 40 boats, contract or otherwise. Another guardian expressed similar opinions. The Annual Report for 1888 referred to the "lesson of the Sacramento and the Columbia", with their depletion. The fisheries service wanted to avoid American mistakes.

In November 1888, Minister Charles Tupper got authority to fix the number of boat licences in the Fraser. In 1889 the government clamped down. Tupper limited the number of licences on the Fraser to 500. Of these, 350 went to canneries, the number varying according to their capacity, and 150 to freezing plants and independent fishermen.

Apparently the sale of licences sprang up almost immediately. The industry began pressing strongly for relaxation of the rules.

As canners fought the clamp-down, the fisheries service in 1890 partly lifted the restrictions, to the alarm of some fishery officers, and set up a commission of inquiry into B.C. fisheries under Samuel Wilmot, Superintendent-General of Fish Culture. Wilmot spent only two days in the Fraser region. His criticisms of improvident fishing and wastage in canneries brought an angry reaction, leading to another Royal Commission in 1892 - with Wilmot again in charge.

Wilmot and two other commissioners had to keep in mind a whole set of questions:

-Both canners and independent fishermen complained about being unable to get boat licences. And what about people holding a licence and failing to use it?

- Canners feared that restrictions on the number of plants could create a monopoly on canning.

- Fishermen feared that canners would get all the licences and monopolize fishing.

- Since canners tended to use Japanese fishermen, what about the rights of white fishermen? There were also 3,000 to 3,500 Indians on the Fraser who had received only 40 licences. (Wilmot: "They are preferable to Chinamen.")

Wilmot favoured controls, but failed to make a big impression on the B.C. industry. (For one thing, he had the mistaken impression that Pacific salmon, like Atlantic ones, could live after spawning.) One of the two B.C. commissioners, the Speaker of the provincial legislature, strongly opposed licence limitation and the prohibition on seines at river mouths.

Following the Royal Commission, the department passed new licensing regulations on March 3, 1894. Controls remained on the number of licences held by each enterprise; but the overall limit on the number of boats vanished.

Under the modified controls, each bona fide fisherman could get one salmon licence, each shipper no more than seven, curers no more than seven, canners no more than 20 (later changed to ten). There were to be no transfers of licences; the holder had to return any licence to the department.

Even if overall control was gone, still the principle remained of using licences to control fishing effort. But in a side effect, restricting the number of boats per canner might encourage the building of new canneries. And enforcement of the new rules may have been slack. In any case, the whole question of limiting Fraser effort rose again in a few years' time.

Other new regulations affected mesh sizes, net depth, and disposal of offal.

In 1895 Prince chaired yet another Commission on B.C. fisheries. The following years saw more regulations, sometimes tempered by industry opposition.

The Department was already restricting trap nets. It took special permission to get the first salmon trap net at Boundary Bay in 1894.

Fishing boundary markers, to keep boats from penetrating too far into rivers, came into use early on. The 1898 Annual Report noted that with seven canner-

THE FISHERY LAWS OF THE DOMINION.

TABLE of Close Seasons in force on 31st December, 1889.

Kinds of Fish.	Ontario.	Quebec.	Nova Scotia.	New Brunswick.	P. E. Island.	Manitoba and N. W. Ter.
Salmon (net fishing)	.....	Aug. 1 to May 1.	Aug. 15 to March 1.	Aug. 15 to March 1.	.....	.....
Salmon (angling)	.....	Aug. 15 to Feb. 1.	Aug. 15 to Feb. 1.	Aug. 15 to Feb. 1	.....	.....
Speckled Trout (*Salvelinus Fontinalis*).	Sept 15 to May 1.	Oct. 1 to Jan. 1.	Oct. 1 to April 1.	Oct. 1 to April 1.	Oct. 1 to Dec. 1.	Oct. 1 to Jan. 1.
Large Grey Trout, Lunge, Winninish and Land-locked Salmon.	.....	Oct. 15 to Dec. 1.	Oct. 1 to April 1.	Oct. 1 to April 1.	.....	.....
Pickerel (Doré)	April 15 to May 15.	April 15 to May 15.	.....	.....	.....	April 15 to May 15.
Bass and Maskinongé	April 15 to June 15.	April 15 to June 15.	.....	.....	.....	.....
Whitefish and Salmon Trout	Nov. 1 to Nov. 30.	.....	.....	.....	.....	.....
Whitefish	.....	Nov. 10 to Dec. 1.	.....	.....	.....	Oct. 5 to Nov. 10.
Sea Bass	.....	.....	.....	March 1 to Oct. 1.	.....	.....
Smelts	.....	April 1 to July 1. Bag net fishing prohibited, except under license.	April 1 to July 1.	April 1 to July 1.	April 1 to July 1.	.....
Lobsters	.....	July 15 to Dec. 31.	July 1 to Dec. 31. On Atlantic coast, from Cape Canso to boundary line, U.S., July 15 to Dec. 31, in remaining waters of Nova Scotia and New Brunswick.	July 1 to Dec 31.	July 15 to Dec. 31.	.....
Sturgeon	.....	.....	.....	Aug. 31 to May 1.	.....	May 1 to June 15.
Oysters	.....	June 1 to Sept. 15.	June 1 to Sept. 15.	June 1 to Sept. 15.	June 1 to Sept. 15.	.....

NOTE.—The following Regulations are applicable to the Province of British Columbia:—

1. Net fishing allowed only under license.
2. Salmon nets to have meshes of at least 5½ inches extension measure.
3. Drift nets confined to tidal waters. No nets to bar more than one-third of any river. Fishing to be discontinued from 6 p.m. Saturday to 6 a.m. Monday.
4. The Minister of Marine and Fisheries to determine number of boats, seines or nets to be used on each stream.
5. The close season for trout is fixed from the 15th October to 15th March.

SYNOPSIS OF FISHERY LAWS.

Net fishing of any kind is prohibited in public waters, except under leases or license.

The seizure of nets is regulated so as to prevent the killing of young fish. Nets cannot be set or seines used so as to bar channels or bays.

A general weekly close-time is provided in addition to special close seasons.

The use of explosives or poisonous substances, for catching or killing fish, is illegal.

Mill dams must be provided with efficient fish-passes. Models or drawings will be furnished by the Department on application.

The above enactments and close seasons are supplemented in special cases, under authority of the Fisheries Act, by a total prohibition of fishing for stated periods.

The footnotes to the 1890 table of close seasons reflect the new limitations in British Columbia, including: "The Minister of Marine and Fisheries to determine numbers of boats, seines, or nets to be used on each stream."

ies now operating on Rivers Inlet, the department should move the fishing boundary down-river.

THE INDUSTRY TAKES A HAND

The number of canneries reached 73 in 1901, a new high. In 1902 the newly-formed B.C. Packers Association, with financial backing from eastern interests, bought 42 of the canneries and two cold storage plants. Thirty of the canneries were on the Fraser.

It was the first of four consolidations in the B.C. canning industry, coming at roughly 25-year intervals, each time with B.C. Packers the moving force.

Salmon canners began to recognize that there were only so many fish. In the Fraser system, the loss of much of the great Adams River run to dams built by loggers, and of Quesnel salmon to dams built by gold miners, made matters worse. To supplement sockeye, canners from about 1903 turned to pink and chum salmon.

The Fraser River Canners' Association tried in 1900 to limit each canner to 20 boats, on a voluntary basis. In 1904, canners did voluntarily restrict the number of their boats in District Two, northern waters.

In 1908, new federal regulations stipulated that salmon canneries must have a licence. The department announced it would issue no new salmon cannery licences for northern B.C. Limited entry was back, at least for canneries.

In 1908 and 1909, the canners themselves tried to limit their northern fishing. They set an overall limit of 850 boats on the Skeena and 750 in Rivers Inlet, and made themselves boat allotments, taking into account their capacity and previous production. But the voluntary agreement began to fall apart in 1909. The provincial government stepped in, and through Babcock took charge of allotments for 1910.

Babcock also agreed to chair a two-man Dominion/Provincial commission on "Boat Rating". The commission recommended, and the Dominion government enforced, a new scheme that specified the number of vessels for each cannery in the Skeena and Rivers Inlet areas, divided the Nass boats equally among the four established canneries, and outlined the number of vessels for other northern canneries.

This was the most thorough limiting of effort thus far, and it came about through an industry-government consensus.

Although the northern canneries had a limited number of boats, they could in theory buy extra fish from independent boats. In practice, however, cannery gill-net fleets dominated the north.

In a further intervention, the department allowed no motor boats north of Cape Caution (i.e. north of the Strait of Georgia and Johnstone Strait) until 1924. The authors of this policy put it forward not for conservation reasons, but to make sure that Indian fishermen could compete more or less equally, without motor boats unbalancing the fishery.

The Pacific fishery thus pioneered in the thorough application of limited entry. And even when licence limitation fell into disarray after World War I, the fisheries service and the B.C. industry sought substitute measures. From the beginning, fisheries people on the Pacific were quicker to grapple with fundamental questions of management.

Another form of limited entry came into play even before the licence freeze on the Fraser. The Department from 1871 to 1920 gave out, for certain waters, exclusive drag-seine or cannery licences. Although these were in a sense local monopolies, protests were few. The Department obliged holders of exclusive licences to pay rent, obey regulations, and sometimes do more. When S.A. Spencer received a nine-year exclusive lease for the tidal waters of the Nimpkish River and vicinity, the Department obliged him to build and operate a salmon hatchery. Other licences stipulated, for example, that a canner use local people in plant work.

The thinking behind these leases was the same as Whitcher's original thinking: a lease-holder would, in his own interest, promote conservation. To quote Cicely Lyons' history of the Pacific salmon industry: "...This method gave a measure of satisfaction. As a system, however, its great defect lay in the fact that the door was left wide open to political preferment and, as might be expected, some abuses did result."

The royal commission of 1905-07 said leases were undesirable. In future years they fell into disuse, although some old privileges stayed in operation until after World War II.

Regulations reached also into marketing. Apparently to protect the processing industry from foreign competitors buying up their raw material, a 1904 regulation prohibited exporting fresh salmon caught in trap-nets. A 1907 regulation extended this policy, requiring that salmon must go through Canadian processing before export.

U.S. FAILS TO CO-OPERATE IN CONSERVATION

As on the Atlantic, Canadian authorities sought U.S. co-operation for conservation. Again, the Americans generally refused. For them, free fishing was the ruling idea.

The 1905-07 Royal Commission on B.C. fisheries noted great growth in the number of American canner-

ies using Fraser River fish. They intercepted homing salmon which passed through American waters on their way to spawn in the Fraser system. The American expansion had put Fraser stocks under a strain.

While Canada had disallowed the purse-seine in British Columbia, the U.S. permitted fishermen to use trap-nets, purse-seines, even fish-wheels. When the Americans began to take the lion's share of salmon from Canada's Fraser River, the fisheries service in 1904 decided to let Canadians equalize their chances by using trap-nets, drag-seines, and purse-seines.

The Department in 1906 partly restricted the purse-seine, to certain waters only. Its use remained common, however, and spread to the herring fishery from about 1910.

Thus, while the purse-seine remained prohibited on the Atlantic, American competition led to its use on the Pacific. There was no ban on a powerful fishing method. This may have strengthened the tendency on the Pacific to regulate capacity and effort - the number of boats and fishermen and the length of fishing times - rather than method.

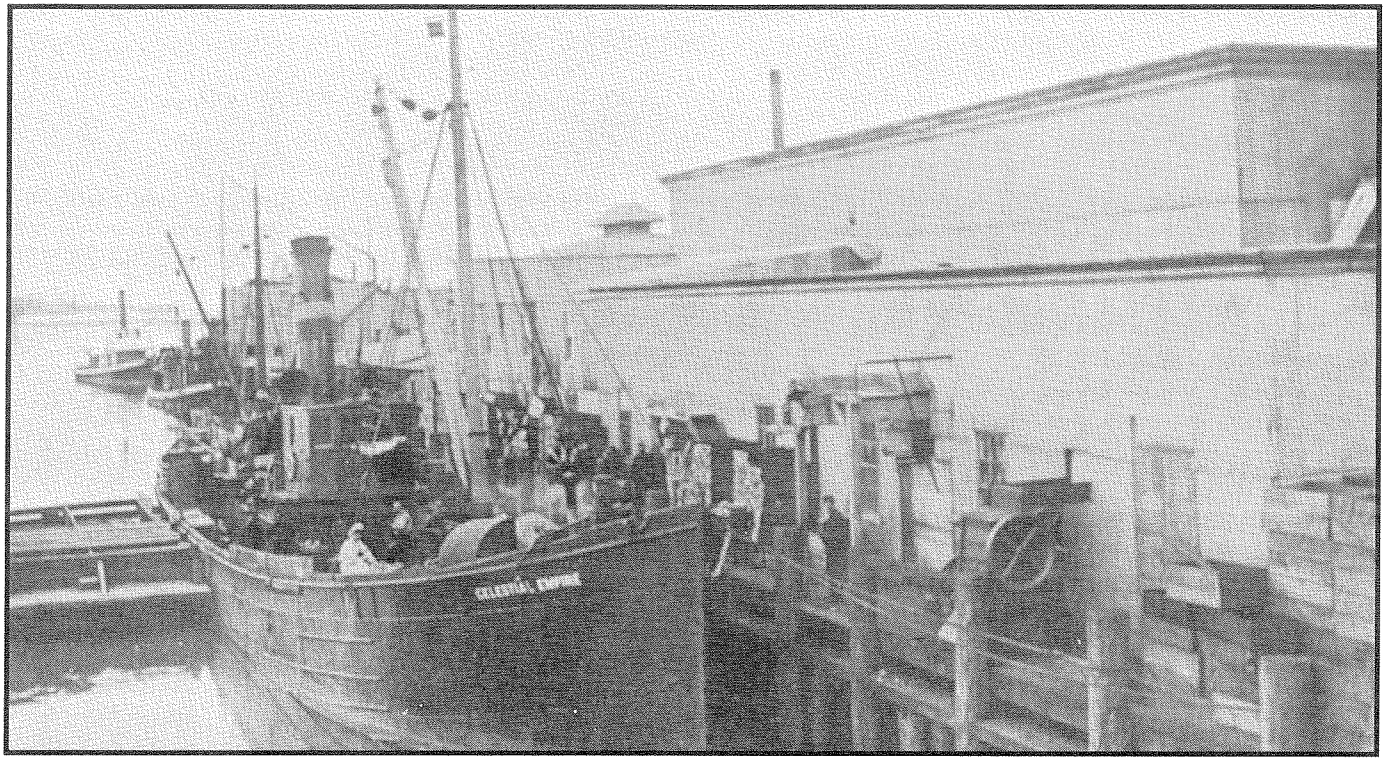
In 1908, the Canadian and American governments negotiated a proposed treaty governing Fraser fishing. It never got ratified, nor did those negotiated in 1919, 1929, and 1930.

In British Columbia, federal and provincial officials (including B.C.'s Commissioner of Fisheries, John Pease Babcock) in this period were beginning to observe and record more systematically the numbers of salmon escaping up-river to spawning beds. This, in future years, led gradually to the management of harvests so as to allow sufficient "escapement."

Officials in B.C. also began trying, over time, to forecast catches based on previous escapements. All of this took place with little help from science, except the empirical science of the fishery officers' own observations.

THE EARLY HERRING FISHERY

Indians in B.C. had for centuries eaten dried herring spawn, collected on cedar boughs at the shallow spawning grounds. A commercial herring fishery began by 1877, with the export of cured herring to South America. In the 1880's, Italian immigrants were among the pioneer seiners, catching sardines. Shore-based drag seines took the entire catch until 1905.



A British Columbia halibut steamer, shown in the 1910-11 Annual Report. "These vessels fish off the Northern coast of British Columbia and run to Vancouver with their catches. Dories - which can be seen on the steamer's deck between the engine-room casing and the rail - are used for setting and hauling the lines on the fishing grounds as in the Atlantic cod fishery."

There were at first prodigious amounts of herring; but as time went on, fewer in the bays. The early superintendent of fisheries Thomas Mowat, reported that the increase in shipping had caused the herring to leave Burrard Inlet. Where they had once seemed inexhaustible, now seiners could catch only a few.

Herring remained a rather small, off-and-on fishery until the 1900's. Then the halibut fishery's demand for bait encouraged the herring fishery, as did new markets for dry-salted herring in the Orient. Regulations soon set limits on mesh sizes, and on the length of gill-nets and drag-seines. Purse-seining began in 1913; and this piece of gear came to dominate a large fishery for herring.

START OF THE HALIBUT FISHERY

In the late 1880's, three small New England sailing vessels began dory fishing for halibut off the state of Washington. They shipped the fish in ice by train, mainly to Boston. In 1888 Sol Jacobs of Gloucester began fishing within the Canadian three-mile limit. In 1889, Thomas Mowat wrote that there was still almost no Canadian halibut fishery, and would be none as long as the U.S. fishermen came into Canadian waters.

The CPR from 1892 on ran refrigeration cars to and from British Columbia. This encouraged the halibut fishery by Canadians and by Americans who landed their fish in B.C. Steamers carrying up to ten dories entered the fishery. Later, as gasoline came into use, gas-powered schooners carried 5-7 hand-line dories.

As more boats entered the fishery, often manned by Scandinavian or New England fishermen, department officials noted depletion of the banks. Some feared that halibut would become a thing of the past. But management remained minimal in this international fishery, until the 1920's and 1930's.

PACIFIC WHALING

Canada now had only an intermittent whale fishery on the Atlantic, including St. Lawrence beluga. When after 1909 a handful of whaling factories started up in British Columbia, and one in Quebec, Canada basically copied Newfoundland's whaling laws. All boats and all manufacturers needed licences. The Minister had to approve the factory site, assure the satisfactory conduct of the business, get the plans of the machinery, and so on. Non-users would forfeit their licence in two years. License fees were $800 for the first year, $1,000 for the second year, $1,200 for each following year; or the government could instead take two percent of gross earnings, letting the firms pay according to production, as the lobster canneries did.

Although the small boom in whaling faded by World War I, at least one whaling company operated in B.C. every year from 1904 until 1942. The Gibson family, B.C. Packers, and Nelson Bros. revived whaling at Coal Harbour in 1947, and this operation continued in one form or another most years until 1967, when the Western Canada Whaling Company finally shut down.

The possible marketing of dogfish, a nuisance fish, drew attention from the Royal Commission on B.C. fisheries in 1905-07; but little happened. The Royal Commission report also recommended a bounty for killing seals, another nuisance to both west and east coast fishermen.

B.C. FISHERMEN BEGIN TO ORGANIZE

Atlantic fishermen were scattered along thousands of miles. But B.C. fishermen were grouped up at the river mouths, and saw each other at the canneries. B.C.'s population already had an urban character. Recent immigrants from Europe were used to organizations in their home countries.

In 1893, fishermen formed the short-lived Fraser River Fishermen's Protective and Benevolent Association. This organization turned down Japanese fishermen as members and tried to exclude them from the industry. The natives manning cannery boats lacked any organization.

In 1899, New Westminister fishermen formed a union. Vancouver fishermen followed suit a few months later, and this union tried to attract Japanese members.

In 1899, white fishermen in New Westminster formed the Fraser River Fishermen's Union, which spread along the Fraser delta. From that year on, Fraser fishermen were rarely without a vocal union or association.

Also in 1899, the Fishermen's Benevolent Society started representing Japanese fishermen. Headquartered at Steveston, this group was to continue until 1942 and the Japanese expulsion.

Labour actions seemed to well up by themselves as much as through any organization. In his history of west coast fishermen's organizations, *Tides of Change*, A.V. Hill notes some big strikes at the beginning of this century in which federal militia had orders to shoot to kill; but most were local boycotts by small groups of fishermen against some particular buyer.

Hill also notes that, as on the Atlantic coast, buyers often controlled fishermen through financing them. Along with a loan to buy a boat or nets would go an unwritten obligation to sell your fish where you got your loan. Fishermen beholden to the buyer were

in no position to bargain strongly over prices. Still, by and large on the Pacific coast, a lot more bargaining took place than on the Atlantic.

A long-lasting organization was the Pacific Halibut Fishermen's Union, which started up in 1901. This group had many members of Scandinavian origin, and Scandinavians are generally more organization-minded than most Canadian fishermen. In 1912 the union became part of the new Deep Sea Fishermen's Union. Although the New England Fishing Company used strike-breakers in the halibut fishery in 1904 and again in 1909, the new union got recognition and made some price gains by 1912. With headquarters in Prince Rupert, the Deep Sea Fishermen's Union was still at work in the 1980's.

After a forerunner organization died away, Pacific salmon producers in 1897 formed the Combination of Cannery Packers. In 1899 this group changed its by-laws to allow members from all areas, and changed its name to the British Columbia Salmon Packers Association. In 1900 the Fraser River packers formed their own separate Fraser River Canners Association. In 1902 the two groups merged under the name of the Fraser River Canners Association. In 1909 the name changed to the British Columbia Canners Association. This association has evolved through various names to become today's Fisheries Council of British Columbia, which represents mainly larger firms.

The B.C. canneries early showed an innovative spirit in licence limitation and other matters. They voted in 1901 to tax themselves an extra $7,500 for fisheries promotion. They also favoured using a government stamp on their products.

CHARACTER OF THE B.C. FISHERY

By the end of the period, the young B.C. fisheries had taken on their permanent stamp. B.C. Packers and the New England Fishing Company were on the scene. The major fisheries - salmon, halibut, herring - were all underway. And the new industry had taken on an aggressive, articulate, organized character, as likely to lead government in management as to follow it.

The Nature of Early Regulation

Did early managers build well? Fisheries managers and Royal Commissions in the period 1880-1910 shaped the Canadian system of management — in essence, a watchful regulation of almost everything in sight. The fisheries service doubled in size, from about 600 persons in 1880 to about 1,200 in 1910; and it worked hard.

More and more regulations accumulated on mesh and net sizes, types of gear, local boundaries, and so on, creating what looked like a morass of ad hoc restrictions. In the 1880's, the main fishery regulations filled only one page. By 1911, a summary of federal and provincial laws and regulations took about 30 pages, and the trend to thorough regulation was well set. Today, the federal regulations alone take about 400 pages.

How good was the regulatory structure the early managers built?

From today's perspective, the Royal Commissions left out three important things, but for understandable reasons.

First, they created no provision for systematically consulting the fishing industry.

At the time, however, the Royal Commission themselves were a form of consultation. As commissioners themselves sometimes pointed out, the fishery itself, especially on the Atlantic, lacked organization; and this hindered consultation.

Second, they failed to apply systematic science to fishery management.

But again, fishery science was in no fit state to be applied to management. Even after Prince and others got organized science going, university influence turned the research more towards investigating the fishes' behaviour. While this had its own value, and would help fishery management in future, it diverted attention from the question most important to industry: overfishing and the abundance of fish. The Department itself collected the basic statistics, and Department official and Royal Commissions did the first rough-and-ready experiments in management.

Third, Royal Commissions and officials only rarely faced directly what we now consider the crux of fishery management: counting the numbers of fish and the level of fishing effort; and adjusting both effort and abundance to achieve a stable, optimum level of catches and incomes.

The idea existed. In British Columbia, the Department was already trying limited entry. On the Atlantic, Prince and others talked about the importance of controlling effort by licensing. But the slow fading away of the shipping-lumbering-trading industry, the increased dependence on fishing, and the lack of alternate employment, made strict licence limitation less likely.

Instead, the industry and Department on the Atlantic thought first of restricting seasons and gear, especially new kinds of gear such as the longline, the purse seine, and later, the otter trawl.

At the bottom of their thinking was the numbers of fish. But it was still rare to couple this to the related question: the numbers of boats and fishermen.

Despite the drawbacks, the fisheries service and the Royal Commissions did well in building the Canadian system of management. Above all, they believed in it, and instilled a conservationist attitude that lasted.

How effective were their regulations? Turn-of-the-century managers failed to control directly the fishing effort - that is, the absolute amount of fishing gear in the water; or the fishing capacity - that is, the amount of boats and gear in existence. But they often tried to control effort indirectly, for example through closed seasons. And they made good use of the second basic tool of management: controlling size and age at first capture. Even when there is no limit on the number of fishermen and the amount of gear they employ, size limits can still afford fish the chance to grow towards full size and value, and to reproduce.

Any statement about the benefit of early regulations requires a certain faith. In 1974, Gordon DeWolf of the federal fisheries department reviewed the history of lobster management. He said much of the same thing that Prince's commission had said in 1898. It was

difficult to quantify any benefits or losses from the previous regulations. DeWolf added that there were serious ground to doubt the value of most regulations for conservation, and they had led to economic inefficiencies.

DeWolf's remarks could apply to most fisheries. Does this mean that all the detailed regulations, enforced with such care and cost over the decades, accomplished nothing? It is more likely that, in total, they had some good effect, especially if compared to a totally uncontrolled fishery.

But the good results are hard to document scientifically; because nobody evaluated the different management measures properly, in origin or execution. The fishery managers did their rough-and-ready experiments without benefit of science; while Biological Board scientists, although documenting the natural history of fish, rarely took part in experimental management.

The fundamental principle in fishery management is to give the fish a chance to grow up towards full size and value, and a chance to reproduce. The multitude of Canadian regulations worked in that direction, and helped keep the industry more stable.

Besides protecting the fish and giving fishermen a chance for a reasonable income, another aspect of fishery management is to keep the industry and public at least partly satisfied, by listening to them, informing them, and sometimes leading them. Here again, the officials and Royal Commissions did tolerably well; although held back, especially in the Atlantic, by the widespread lack of information and organization. Even if the Royal Commissions were a rough and ready method, without much science to back them up, and even if they created an all-sorts hodge-podge of regulations, still those regulations helped to keep alive every major sea fishery, and the communities that depend on them.

When Prince and colleagues were writing all the rules and regulations, how well did the officers enforce and fishermen obey them? Then as today, it is hard to know for sure. But a certain Canadian respect for regulations goes a long way back in the fisheries. It shows up in the recollections of old people and in the records of old controversies. If regulations had been something to laugh off, industry people would have ignored instead of fighting them.

The U.S. Commissioner of Fish and Fisheries in the 1870's noted that Canadian fishermen went by the regulations more than Americans (who had fewer regulations to start with). This is still true. Today there are those who say fishermen collectively take ten times more fish than they should; but in most fisheries, the best opinion puts it closer to one-tenth more.

DIFFICULTIES OF COMMON PROPERTY MANAGEMENT

Prince remains a fundamental figure, like Whitcher before him. The system of regulation that lasted to the 60's - limits on gear, on seasons, on practically everything but the numbers of fish and fishermen - was his creation as much as anyone's. He brought organized fisheries research into being. He recognized the importance of limiting licences and adjusting the number of people to the abundance of fish.

If he failed to carry limited entry through, he was in good company. Only in the 1960's and 1970's did limited entry become widely recognized as a potential provider of good stable incomes, and a chief defence against overfishing.

Scientists categorize two types of overfishing. The first is "growth overfishing" - harvesting at such a rate that the average fish never reaches full size. This results in loss of yield, the same as cutting trees when they're only half-grown.

The second is "recruitment overfishing" - fishing so hard you cut down the effective birth rate ("recruitment"), and threaten a particular stock's ability to sustain itself; just as continued harvesting did away with many pine forests in eastern Canada. (One speculates that Whitcher, when working in the Crown Lands department of the United Canadas, developed some of his fisheries thinking by watching what was happening in the forests, including the use of licences and leases from about 1825.)

A common property fishery is a permanent invitation to overfishing. The sea can give such an illusion of plenty and of freedom, it is hard to get people to recognize the finite abundance of fish, let alone except limits on their own rights to fish.

If too many people start working this common property, a vicious circle arises. It makes sense for an individual to take all possible advantage of a free fishery. But the more people fishing, and the harder they fish, the more the abundance of fish drops back. Growth is lost; stocks may even disappear. The additional fishermen are dividing a shrinking pie into thinner and thinner slices. As the overall catch drops, the catch per boat drops even faster, while expenses are likely to rise.

In an overfishing situation, the fishermen would actually catch more by cutting their total effort, to let stock abundance rise. But once caught in the race, what fisherman can afford to cut his effort? He knows that he will lose money in the short term. He has less certainty that a cut-back in effort will pay off in two or three years. He may distrust the willingness of his fellow fishermen to cut back fishing, or the ability of

managers to make them do so.

Although fishery managers like Prince understood the effects of too much competition, only in the 1950's did the Canadian economist H. Scott Gordon, after working with the Department of Fisheries, give clear theoretical expression to the way that increased effort reduces both abundance and profitability. A combination of factors, including pressure from certain groups of fishermen in the late 1960's and the 1970's finally brought the Canadian government to limit the number of licences in all major fisheries. A 1978 leaflet, *Fisheries Science*, outlined the new conventional wisdom. The leaflet reflected the work of Gordon, A.D. Scott, and others; and drew directly on texts by Department of Fisheries and Oceans scientists R.G. Halliday, A.T. Pinhorn, W.T. Stobo, and W.G. Doubleday.

Virgin Stock

We'll start at a square-one situation. When a stock of fish has never been fished, scientists call it a virgin stock. The total weight of this stock is larger at this time than at any other time after it has been fished.

A virgin stock exists in balance with its environment. It's balanced because growth of individual fish in the stock and additions through reproduction **equals** the weight of fish which die from natural causes (natural mortality) such as predators, starvation or disease.

The net (total) growth rate of a virgin stock is zero because the weight of the fish which die from natural causes cancels out the weight of the fish being hatched and growing in the stock.

Changes Caused By Fishing

Fishing upsets the balance of a virgin stock. As soon as fishing begins, the death or mortality rate of the stock goes up, and because deaths by fishing are removing fish from the stock, the size of the stock goes down.

However, because there are less fish in the stock, there is more food for the fish that escape the fishermen. In other words, there is less competition for food. When there is less competition for food, individual fish grow faster and less fish die from natural causes.

The faster and more intensively a virgin stock is fished, the faster the remaining fish grow and replace themselves. So even though the stock size goes down because fish are being taken from it, the net growth rate of the stock as a whole goes up. The stock keeps trying to replace itself as though it was in the virgin state. It adds new weight to itself at a faster rate, trying to replace the weight the fishermen remove.

But this net growth rate does not continue to go up forever - it's related to the size of the stock. When the size of the stock goes down to a certain level, the net growth rate reaches its highest point and then drops off quickly. It will eventually diminish to zero, when the stock size approaches extinction.

This up and down relationship between stock size and the rate of net growth is shown on **Graph 1.**

Total Catch and Catch Rates

When a fisherman starts fishing a virgin stock, his total catch (total tons of fish caught) will be high and the catch rate (pounds of fish per hundred hooks fished, or pounds per otter trawl tow, for example) will be high at the beginning, too. At this time, the stock is being only lightly exploited, the net growth is increasing, and the size of the stock as yet hasn't gone down very much.

However, as more and more vessels fish the stock, the stock size is, of course, dropping down from fishing mortality, and the net growth rate of the stock is getting closer and closer to reaching its peak. Scientists call the level at which this peak or high level of total catch is reached the level of **Maximum Sustainable Yield** or **level of MSY.**

As more fishing brings the stock closer and closer to the level of MSY, the total catch will increase slowly, but a single boat's catch rate will really start to drop off. At the level of MSY, individual catch rates will have gone down 50% or more from what they were for the virgin stock.

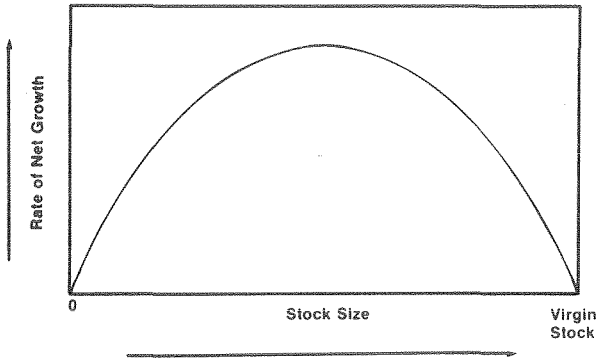
Graph 2 shows how the total catch increases before the MSY level is reached and drops off after.

Graph 3 shows how both the size of the stock and the catch rates drop down quickly from the point when the stock is first fished.

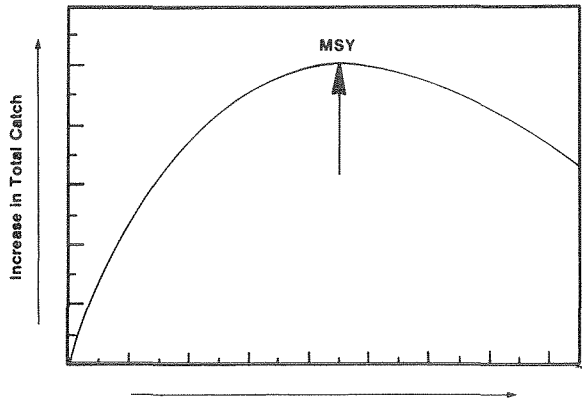
To sum up: if a stock is fished at the level of MSY or close to it, the total catch will be maximized but individual catch rates will become lower and lower as the MSY level is approached.

If a fisherman's catch rate is low, he will soon be placed in a break-even financial situation at best, and will lose money at worst. He'll be making more trips out, for example, to catch

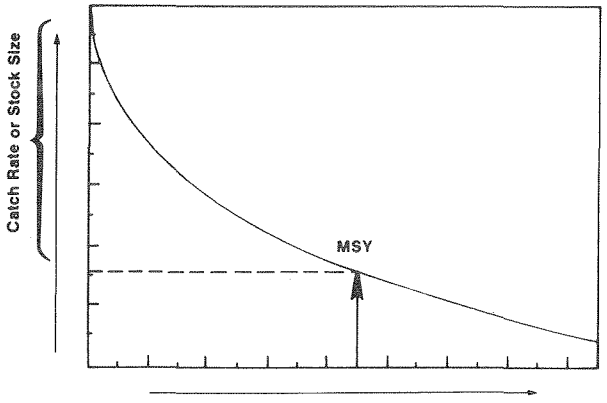
GRAPH I



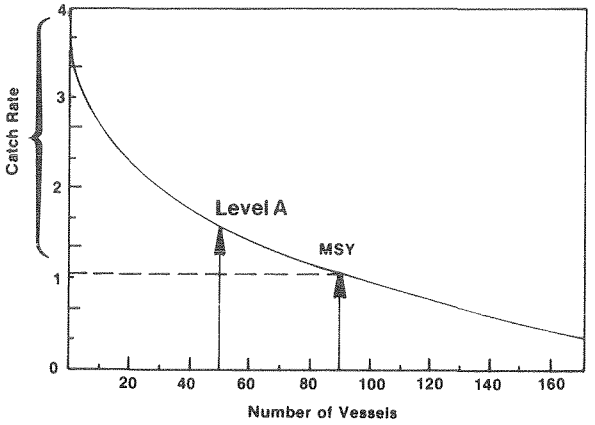
GRAPH 2



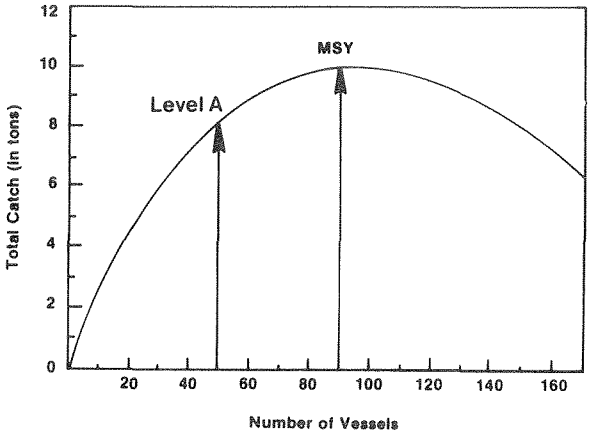
GRAPH 3



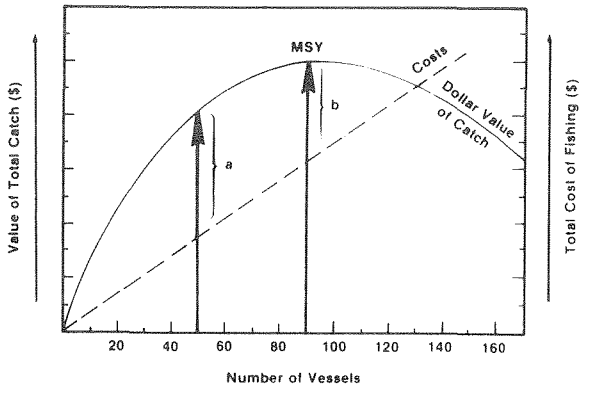
GRAPH 4A



GRAPH 4B



GRAPH 4C



Level of Fishing	Number of Vessels	Tons per trip	Total Catch (in tons)
Level A	50	1.75	87.5
MSY Level	90	1.09	98.0

basically the same amount of fish.

On the other hand, if the whole fishing effort is controlled (as it is under the limited entry program) so that fishermen take a certain amount of fish at some point before the level of MSY is reached, their costs will be lower and their returns higher.

In other words, if our purpose of fishing is to maximize the poundage of fish caught, **regardless of the cost of doing so**, then the MSY level is the most favourable approach. However, if **our purposes is to maximize earnings from our fishing effort** (as is the case in Canada), then we need to fish at a yield level where the costs of fishing are taken into account.

Let's look at these two approaches in terms of vessels, catch rates (or cost of fishing) and total catch, using an example stock. If the stock was fished at the level indicated by the arrow "a" on **Graph 4A** (which shows catch rates) and **Graph 4B** (which shows total catch), the results would be those shown on the table.

Worked out in percentages, it can be seen that from the level indicated by the arrow "a" to the MSY level, the number of vessels fishing has gone up 80% and the total catch has gone up 12%. However, the tons of fish caught per trip out, or catch rate, has gone down 37%. In other words, **the more the stock is fished, the faster it reaches the MSY level, and the closer one gets to the MSY level, the more it costs to fish.**

We can examine **Graph 4C** to more clearly see how the cost of fishing is higher at the MSY level than at a point before MSY is reached. Look at the distance between the dollar value of the catch and the cost line at the level indicated by the arrow "a" and the MSY level "b":

Marine fisheries management is now founded on the principle discussed above, commonly called a "best use" basis. The cut-off point for TAC's is now geared to the **optimum** sustainable yield level which corresponds to a point where net returns from the total fishery are highest - i.e. before the MSY level is reached.

In other words, **catch quotas are set on the basis of economic catch rates, with the biological facts setting the limits.** These economic catch rates will vary, of course, from species to species, and depend very much on costs and prices received.

— Excerpt from **Fisheries Science: How and Why It Works For Marine Fisheries.**

This leaflet and many other documents and speeches of the 1970's and 1980's reflected an ever-growing consciousness of the destructiveness of over-capacity in a common-property fishery. The same mechanism applies to common-property grazing lands. The economist Garrett Hardin coined a term now often applied to fisheries: "the tragedy of the commons".

Since Gordon's 1953 explanation and subsequent variations on the same theme, the above view has become an article of faith among most federal fishery managers. But it only confirms the understanding of the early managers. Whitcher, Prince, the B.C. river managers, and others defined the management struggle that plays itself out over and over. Besides all the other controls, they wanted limited entry and limited effort, to help both conservation and incomes.

If thoroughly applied, limited entry encourages conservation, and reserves the returns to a smaller number of privileged fishermen. It can to some degree provide a good fishery even if the surrounding economy is weak; witness the Newfoundland crab and trawler fishery today. But the poorer the nearby economy, the more difficult it has been to restrict entry; because others want a crack at what is, after all, a common property.

Chances were better on the Pacific because salmon were more visibly vulnerable, because the industry had a better collective consciousness, and because the general economy was better. But even there, it took many decades to limit entry and effort successfully, if indeed it has happened yet. In the 1970's, after the federal government limited the number of boats in the salmon fishery, fishermen converted their expansionist drive into a race for better boats with more fishing power, and again pushed the fishery into trouble.

The B.C. and other fleets have shown that even with limited entry, fishing power tends to creep upward as fishermen compete. Indeed, limited entry is sometimes a victim of its own success, as rising incomes lead to bigger boats, which are more expensive to pay for, thus requiring ever-harder fishing. The fisherman knows intellectually that conservation would help him tomorrow, but emotionally he wants fish today - both for money and for self-esteem.

The existing fleet's appetite is only part of the problem. Whenever a fishery is prosperous, people outside the fishery feel they have a right as part-owners of the common property to get into the business. When licences are limited, fishery managers face constant demands to create new ones.

Today fishery managers are turning more and more to a further development of limited entry. Be-

sides setting aside fish for a particular fleet, they subdivide the fish into individual quotas by boat or company. "Quasi-property" has taken over from limited entry as the governing ideology. Individual quotas offer hope that fishermen will begin to treat the fish stocks as their own property, and try to build up their abundance while cutting fishing costs.

It amounts to a rediscovery of Whitcher, who wrote about salmon stands that: "Where the fishery is carried on in a desultory and improvident manner, under such incitements to excess as are created by contentious rivalry and the prospect of mere temporary gain, it is extremely difficult to control fishing operations within reasonable bounds. But, on the other hand, where occupants can rely on the permanence of their holdings, and enjoy in successive years the benefit of their own moderation in each preceding season, the Department finds very little difficulty in controlling the pursuit."

ATLANTIC AND PACIFIC: SOCIETY SHAPES MANAGEMENT

From 1880 to 1910, federal fisheries management spread out to cover every major fishery. Everywhere there was watchful worrying. Everywhere the regulations were starting to go beyond conservation, to touch quality, development, marketing. On occasion, they favoured local fishermen against vessel-owning companies or against threatening technology.

But there also emerged differences in the three great fisheries: Atlantic, freshwater, and Pacific. It seems that the differing natures of the fishing industries and their surrounding societies set a stamp on management.

On the Atlantic, an air of decline had settled over the fishery, reflecting the wider economy, where shipping and boat-building were losing vigor.

"THE NON-PROGRESSION OF THE ATLANTIC FISHERIES OF CANADA"

J.J. Cowie, the recruit of Prince's who later served briefly as Deputy Minister of Fisheries, published an article in the Department's 1909-1910 Annual Report on "The Non-progression of the Atlantic Fisheries of Canada." Cowie said that the concentration on salt fish, rather than (as in the U.S.) fresh fish, had held back development. Only recently had anyone put smoked fillets onto the Halifax market. Retailing was poor. Despite the new subsidy, transportation remained a problem. Canadian fish products needed promotion. He advised bringing in an inspection program and revamping the inadequate Fisheries Intelligence Bureau.

Cowie's vigorous critique was the Department's most open commentary to date on the slowness and slackness of the Atlantic industry. In the decades following, similar litanies recurred over and over. Different attempts at development got under way but met no great success, as though some essential element was missing.

ATLANTIC PROBLEMS MORE DIFFUSE

The technology of early times had helped to fragment the Atlantic fishery. Salt-fish processing mainly depended on local fish, and flakes took up a lot of room on the shore. As one cove became crowded, fishermen would move to another. The nature of the industry spread a thin layer of settlement all along the coast.

This worked against consolidation and streamlining. In the B. C. salmon industry, entrepreneurs with good finances took over many canneries and created powerful companies. But on the Atlantic, no one consolidated the declining lobster canneries or almost any other part of the industry, until after World War II. The east coast suffered from the defects of its virtues: the independence and community feeling of coastal villages shaded into fragmentation and frequent backwardness. Compared with British Columbia, there was less education, organization, and discipline.

On the Pacific coast, the salmon fleets massed up on the doorstep of the cities. Catches came fast and furious, followed by declines, followed by far-reaching regulations including licence limitation. People could find work elsewhere.

On the Atlantic, people were gradually forgetting the former abundances of fish, never well documented, and were getting used to fishing at a lower level. There was no burgeoning of other industries to provide alternate employment. Prince pleaded in vain for strict control of licences. The high dependence of Atlantic communities on the sea worked against any such idea. So did the ever-present thought that "there's lots more fish in the sea", and that everyone deserves a chance to fish. It is always difficult to connect the positive idea of good, hard work by fishermen with its negative shadow, the increased chance of overfishing when more fishermen chase fewer fish.

Since the 1870's much of the Atlantic fishery has existed in unease, poised between the advocates of industrialism — usually associated with larger vessels, mass production, more efficiency, fewer jobs — and the advocates, not of any particular vision, but of survival. In hundreds of small communities, and thousands and thousands of small fishing enterprises,

people want above all to protect their livelihood.

This underlying tension most often manifests itself in conflicts between large trawlers, operated by large companies than can command capital, and small owner-operated boats. Examples include the "trawler ban" of the 1930's, and opposition to factory freezer trawlers in the 1980's.

RECREATING THE "GOLDEN AGE"

In its 19th-century heyday, of a vigorous wood-wind-water economy and seemingly "a forest of masts" in every port, the Atlantic economy was relatively strong. At least it appears so through the mists of time; although there are few accounts of prosperous fishermen. In the post-Confederation, pre-World War I period, rather than chasing industrialization through railways and the like, could business and political leaders have kept the Atlantic coast a trade entrepot where fishing and transport continued to reinforce each other?

Some observers hold up the model of Norway, where wood and steel vessels are the veins of the economy, and shipbuilding, equipment manufacturing, shipping, and fishing all link together. But Norway may be a poor comparison. Geography forced the Norwegians to rely on marine transport. Otherwise, they might have made the same partial turn from the sea as Atlantic Canadians. And for most of the 20th century, until the North Sea oil discoveries, Norway was the poor cousin of Scandinavia.

For Atlantic Canada, the alluring vision of a recreated "Golden Age" based on a marine economy is probably impossible. Of the old pillars of the marine economy - lumber, shipping, trading, and fishing - only fishing retains anything like its old dimensions. But the fishing industry by itself could hardly restore the general vigour of the old multi-element, self-reinforcing marine economy.

Even though the general Atlantic economy lost vigor in the late 19th and early 20th century, the fishery still had its day-to-day pleasures. Some fishermen lived on the edge, or gave up the fishery to out-migrate. Some got by not badly. Some did well. Problems rise to the political level and get recorded. It is easy to overlook the higher qualities of the fisherman's independent, community-based life, working outdoors on beautiful waters. Many and probably most Atlantic fishermen had good lives, with their own houses, their own boats, and their own importance to their communities.

Even today, Atlantic fishermen with little alternate employment seem half in thrall to big companies, market changes, government and its regulations - and yet, they often seem freer than the company man or the bureaucrat. Indeed, there is such amplitude in the coastal situation that it may be unwise to compare fishing with any other occupation. It is hard at times to know if a fisherman is closer to a peasant or a king.

FRESHWATER

During the 1880-1910 period, the fisheries of the Great Lakes passed under provincial control. Management began to allow the fishing down of species after species, to be replaced by lesser ones. But the industry was relatively small, and alternate employment was great. Producers were close to a strong fresh-fish market. The Great Lakes fishery continued in relative content compared with the Atlantic.

On the Prairies, the fishery was still young. While Winnipeg was booming and other new cities starting to burgeon, the often remote lake fisheries soon developed problems. As on the Atlantic, fragmentation and lack of alternate employment compounded the difficulties. The 1880-1910 period started a pattern of potentially far-reaching regulations such as quotas, applied too loosely to do much good. Complaints remained rife until after World War II, about quality, American control of marketing, and other problems.

B.C. FISHERY TAKES THE LEAD

By 1910 the B.C. industry, only about three decades old, already seemed more consolidated, better regulated, and more able to do things together than the Atlantic industry. What explains the difference?

Apart from anything else, B.C.'s general economy already seemed stronger. The greater regional circulation of money and know-how aided the fishery; and the stronger economy could more easily pull low earners out of the fishery towards other opportunities.

Depletion was still fairly new on the Pacific. People still could see or remember the ocean's original productivity: for example, when herring ran onto the beach at Nanaimo to be left knee-deep for two miles. Declines in stocks, and losses such as the salmon runs at Quesnel, struck the imagination and the conscience. This aided management, including licence limitation.

SALMON AS TEACHERS

In Canada, regulation moved from the rivers out, starting with salmon and other river and estuarial species. People could see them getting scarce. In salt water, pelagic species such as herring and mackerel,

with their migrations and their concentrated abundance often close to shore, also have a way of bringing fisheries question to a head. Already by the 1890's salmon and pelagics had led to the first major attempt at limited entry, in the B.C. salmon fishery; to the first major ban of a gear type, the purse seine; to the Bait Act in Newfoundland; to the 1890 Inspection Act aimed at pickled fish; to the Fisheries Intelligence Bureau; and to the bait freezer development.

The salmon's long upstream migration, often past great cities, makes it vulnerable. But the same migration makes salmon visible to a wide population that admires them. That visibility is one key to Canada's relative success in conserving Pacific salmon.

B.C. fisheries from the beginning had more of a critical mass. There were more boats grouped up to threaten the fishery and cause alarm. More fishermen lived near growing cities: Victoria, Vancouver, Nanaimo, and Prince Rupert. There were more recent immigrants with experience elsewhere and new ideas. Organization came easier. Information flowed better. There was more willingness to take hold of the fishery and make it work.

This question of information and organization, and of connectedness rather than fragmentation, is of great importance to fishery management. Compared with the Atlantic fishery, the British Columbia fishery had less fragmentation, for reasons including settlement patterns, fewer major species, and the migration patterns of salmon. There was more organization and more streamlining. Fishermen were generally better educated. All these factors helped the Pacific fishery lead in limited entry and certain other aspects of management. Fisheries administrators have time and again, from the 1850's on, noted the issues of education and organization on the Atlantic coast; and have made scattered attempts at addressing them (notably in assisting the co-operative movement in the 1930's); but rarely with lasting effect.

In decades to come the B.C. industry and fishery managers never became defeatist, never gave up. In an often uneasy alliance, the public, the federal fisheries service, and the fishing industry have battled the triple threats of overfishing, pollution, and habitat destruction by dams and developments. The B.C. industry itself either took the lead or worked in step with the federal government on product quality, licence limitation, and salmon enhancement.

The Pacific fishery of course had its own troubles. In this century the B.C. salmon fishery has dropped to half its highest historic levels. But current efforts have increased it. And when one compares, for example, the American destruction of salmon in the Columbia River, the preservation of even half the early levels of the B.C. fishery counts as a victory.

The Pacific fishery did better than the Atlantic, for most of the 20th century, at providing decent livelihoods and good quality products across the board. And the surrounding society and economy, along with the concentration and visibility of the fishery, helped create this relative success.

The conflict of big boat versus small, of moneyed mobility versus static communities, seen in the trawler controversies on the Atlantic, never took so clear a form in British Columbia as on the Atlantic. A few large companies dominate shore-side operations, but owner-operated, small and medium-sized boats dominate the fleet.

How did B.C. avoid a water-borne conflict of big versus small? Various answers suggest themselves. Salmon are most easily caught near the river mouths, where small boats can work well. The advantage of big boats over small boats is less marked than in many Atlantic fisheries. Also, government regulations restricted the size of seines and gill-nets. This held back growth in the size of boats.

CONCLUSION

What did Whitcher, Prince, and the other early managers leave behind them? At one level, the story until World War II is a sad one.

On the Atlantic and the prairies, some fishermen, processors, and communities always did better than others; but too few showed any notable success. Especially after the turn of the century, report after report, decade after decade, pointed to poor quality, poor marketing, poor control of capacity, poor information and organization, and a general lack of co-ordination.

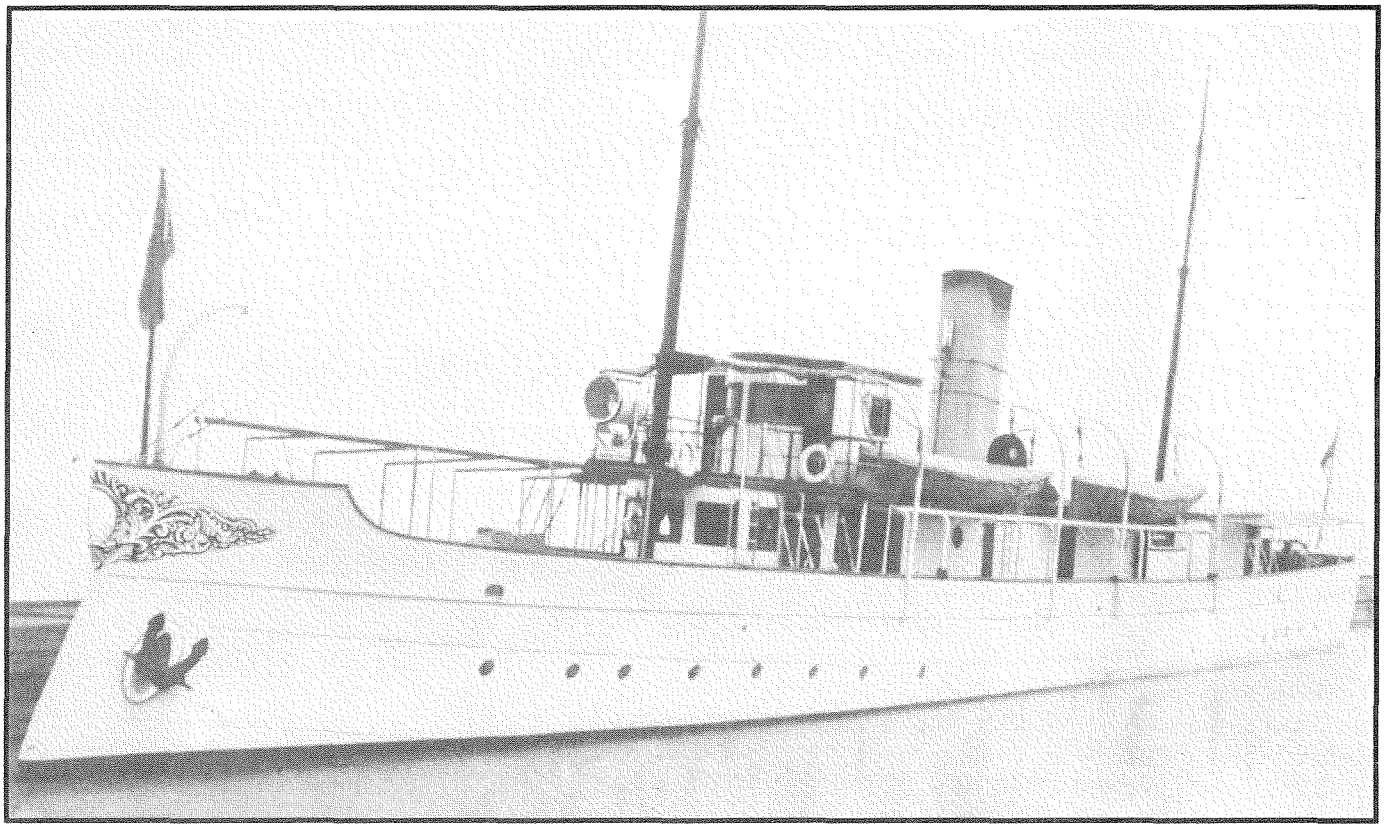
The fisherman's life has special values: being his own boss, being outdoors, usually with his own boat and his own house and his own close community. But on the Atlantic, his income was almost always low, and always unstable. He and his fellow fishermen generally lacked knowledge of the industry outside their own domain, and lacked organized power.

Atlantic processors and traders had more influence. And those in the trade always had the excitement and satisfaction of making deals. But generally speaking, they too lacked organized power or stable revenues.

Whitcher, Prince, and successors such as Stewart Bates wanted an industry with some kind of integration, from the resource to the market. None could overcome the industry's centrifugal forces and fragmentation.

The Department never made a concerted attack

The fisheries service becomes totally engrossing to many of its officials; probably because the challenges never stop. William Wakeham (left) *was an early example, leaving aside his medical career as he got caught up in fisheries. He also demonstrated the wide reach of fisheries matters. Wakeham helped establish Canadian sovereignty in the Arctic; and in his time the fisheries protection fleet became the nucleus of the Canadian navy. The fisheries vessel 'Vigilant'* (below) *was " the first modern warship to be built in Canada." Wakeham also exemplified the department's persistent concern with social matters, as shown in his account of an early resettlement. On the north shore of the St. Lawrence in 1886, there was distress because of... "the almost complete failure of the cod fishery between Esquimaux Point and Blanc Sablons. The distress was greatest at and about Natashquan, and it was wisely decided to aid all who were willing to do so, to leave the coast. With this object, your Department sent the Dominion steamer 'Napoleon' to Natashquan, and she carried to Quebec about one hundred and sixty persons; at Quebec these people were taken charge of by the Local Government, and removed to the County of Beauce, where arrangements had been made to settle them. It is to be hoped that they will succeed in making a better living as farmers, than they did as fishermen."*



on chronic Atlantic problems such as quality. After Prince and the turn-of-the-century Royal Commissions wrote the regulations, the Department settled down to enforce them, with inconsistent success, and showed little creative force until post-war.

The early splitting of the Biological Board from the Department held back the application of science to management. The freshwater fisheries time and again foreshadowed sea fishery developments and management methods; but these early warnings generally went ignored.

Nobody measured the effect of hatcheries until half a century after they began. Nobody measured the impact of regulations. Nobody studied the exact effects of different technologies on jobs and industry efficiency. Federal management took place through a kind of political seismograph. Given enough of an explosion in some corner of the industry, the Department or a Royal Commission would react.

Although far from perfect, British Columbia did better in every way. The industry grew in a more consolidated manner. The general economy was stronger, and this helped the fishery. Both processors and fishermen were more organized and more conscious of management; especially since people could see the salmon struggling to climb the rivers, and could realize their vulnerability.

On the Pacific, the fishing industry at times led the government in management. On the Atlantic and on the prairies, government usually tried to lead the industry, without much success. In the decades before World War II, fishery managers thought up every kind of management measure, including licence limitation, overall quotas, and individual boat quotas. But application was often weak; partly because Ministers after Mitchell were often weak. Seldom was there a sufficient combination of political will and industry will to make major improvements.

Despite the fishing industry's chronic troubles, at another level the Department succeeded brilliantly.

It bolstered Canadian strength and sovereignty vis-a-vis the U.S., and in the Arctic.

It created probably the best Fisheries Act in the world, with strong powers over pollution and licensing. Transmitting themselves through the decades, Whitcher's ideas on licensing helped provide whatever stability the Canadian industry has had. Licences, and the idea of licences, never went out of use.

As alternate employment increased after World War II, limiting the number of licences became more feasible, and the ideas of Whitcher and Prince, re-expressed by the United Fishermen and Allied Workers Union, H.S. Gordon, W.C. MacKenzie, and others, became in the 1970's the basis of management.

Today the Atlantic salmon have mostly vanished from U.S. rivers, and many of the old fishing towns have abandoned the industry.

Canada kept its salmon, and almost all other major fisheries. It kept its fishing communities. It kept a dedicated fisheries department, its work rarely understood by those outside the industry, and often resisted by those within the industry. It kept a hodgepodge of fishery regulations that, for all their inconsistencies and defects, must have done something right.

The work done before the second World War laid the foundations of modern Canadian fishery management. And Canadian fishery management today, with a generally strong resource, strong science, and a strong consultative system, has few equals in the world.

Statistical Snapshot

The Fishery and Fisheries Service — 1880 and 1910

In 1880 the "Establishment Staff" of the entire Department of Marine and Fisheries in Ottawa numbered 25, including the Minister J. C. Pope. Pope earned $7,000; Deputy Minister William Smith $3,200; Commissioner of Fisheries W. F. Whitcher $2,400. In the Outside Service (i.e. outside Ottawa), the Fisheries Branch already employed 594 Fishery Officers including Inspectors, Overseers, and Wardens in the Outside Service (i.e. outside Ottawa). These included only two in British Columbia (Inspector A. C. Anderson, salary $600 yearly, and Overseer George Pittendreigh, salary $500). Nova Scotia had the most fishery overseers and inspectors and wardens, 240 of them. The overseers and inspectors were the main figures; overseers could act *ex officio* as magistrates. Salaries varied greatly: for example, in Ontario an overseer might get $40 a year or might get $400. These were the days before civil service reform and the merit principle; appointments were to some degree political. For wardens especially, work was part-time. There was only one vessel in the Fisheries Protection Service, this for the Gulf and Lower St. Lawrence. Fifteen of the outside staff worked in the ten hatcheries. Fish culture took more than $29,000 of fisheries spending, which came to more than $86,000.

The reported market value of the fisheries in 1880 was $14.5 million. Contemporary sources often thought the fishery to be undervalued, because of poor statistics. Nationally, cod led by far. Apparantly, as a result of Whitcher's disputes with his superiors about the need to give fisheries a higher place, he refrained

45 Victoria. Sessional Papers (No. 5.) A. 1882

FISHERIES STATEMENTS

FOR THE YEAR 1881.

PRODUCE AND VALUE OF THE CANADIAN FISHERIES.

The total value of the production of the Fisheries of Canada in 1881, is $15,817,162.64. The value in the previous year amounted to $14,499,979.71, an increase of $1,317,182.93, exclusive of the catch in Manitoba and North-West Territories, of which there are no returns.

GENERAL RECAPITULATION of the Yield and Value of the Fisheries in the Dominion of Canada, for the Year 1881.

Kinds of Fish.		Quantity.	Value.
			$ cts.
Salmon	Brls.	6,038½	56,453 00
do fresh in ice	Lbs.	1,037,945	165,806 11
do fresh	Pieces.	157,931	44,646 50
do smoked	Lbs. & boxes.	7,191	2,538 50
do preserved in cans	Lbs.	8,524,827	1,066,149 70
Cod	Cwt.	1,075,507	4,468,391 75
Pollock	"	54,538	190,883 00
Haddock	"	116,978	409,832 00
do	Lbs.	95,263	83,642 10
Hake	Cwt.	152,327	533,144 50
Halibut	"	263	1,578 00
do	Lbs.	1,017,395	61,043 70
Herring, pickled	Brls.	362,354	1,490,018 00
do smoked	Boxes	1,060,416	267,604 00
do frozen	Hhds.	16,050,000	64,200 00
Mackerel	Brls.	105,772½	1,046,343 00
do preserved	Cans.	390,666	58,599 90
Alewives	Brls.	44,039	176,197 50
Ling	Cwt.	75	300 00
Shad	Brls.	14,819	118,552 00
do	No.	116,977	10,527 93
Bass, Trout and Smelt	Lbs.	410,750	24,645 00
Bass	"	388 833	23,329 98
do	Brls.	2,767	13,835 00
Trout	"	9,700	96,757 00
do	Lbs.	606,177	41,079 48
Smelts	"	1,994,903	117,600 30
Sturgeon	"	675,121	38,893 26
do	Brls.	3,361	16,805 00
White fish	"	5,079½	50,795 00
do	Lbs.	2,608,161	131,806 60
do	No.	677,320	67,732 00
Bar and White fish	Doz.	5,270	6,587 50
Carried forward			10,945,317 29

GENERAL RECAPITULATION of the Yield and Value of Fisheries, &c.—*Continued.*

Kinds of Fish.		Quantity.	Value.
			$ cts.
Brought forward			10,945,317 29
Bar Fish	Lbs.	11,400	912 00
Pike	Brls.	1,775	8,875 00
do	Lbs.	295,200	14,760 00
Pickerel	"	252,100	15,126 00
do	Brls.	4,257	21,285 00
Maskinongé	"	1,523	7,615 00
do	Lbs.	128,160	7,689 60
Sciscos	Brls.	580	2,320 00
Eels	"	2,872	25,798 00
do	No.	337,267	33,726 70
do	Lbs.	17,500	1,050 00
Coarse Fish	Brls.	6,420	19,260 00
Mixed Fish	"	75	450 00
do	Lbs.	1,349,400	26,988 00
Small Fish	Brls.	2,103	4,206 00
Tom Cod	"	6,890	10,335 00
Winnonish	No.	36,600	9,150 00
Sardines	Brls.	4,648	13,944 00
do	Hhds.	19,250	115,680 00
Oysters	Brls.	31,498	94,491 00
Lobsters, preserved	Lbs.	7,173,781	1,391,710 40
do do	Cans.	10,316,742	1,547,511 30
do	Tons.	543	16,640 00
Cod Tongues and Sounds	Brls.	1,596	11,460 00
Cod and Hake Sounds	Lbs.	85,853	81,122 25
Oolahans, pickled	Brls.	235	2,350 00
do do	½ brls.	230	1,150 00
do do	Kitts	50	125 00
do smoked	Boxes	500	500 00
do fresh	Lbs.	3,100	186 00
Haddock and other Fish (dried)			250 00
Halibut, fresh, in ice to San Francisco—Customs Returns			578 00
Fish scrap, dried	Tons.	10	200 00
Seal Skins	No.	71,742	220,693 00
Hair Seal skins	"	3,500	1,750 00
Sea Otter skins	"	150	6,000 00
Porpoise skins	"	8	32 00
Seal Oil	Galls.	220,157	110,078 50
Whale Oil	"	12,985	5,194 00
Cod Oil	"	333,310	133,324 00
Porpoise Oil	"	497	248 50
Oolahan Oil	"	1,630	1,630 00
Herring Oil	"	16,000	6,400 00
Dog Fish, Seal and Porpoise Oil	"	142,240	56,896 00
Dog Fish Oil (refined)	"	27,000	14,850 00
Fish Oils, other	"	524,428	340,878 20
Fish used as Bait and Manure	Brls.	174,844	165,895 50
do do	Tons.	4,130	826 00
Fish Guano	"	2,914	43,710 00
Fish used for local consumption	Brls.	24,323	93,239 00
Fish for home consumption	Pieces		48,790 00
Fish sold in markets	"		70,500 00
Hake Sounds and Fresh Fish in Digby Co., N.S.	Lbs.		26,918 40
Squid in Guysboro' and Victoria Counties, N.S.	Brls.	2,400	9,600 00
Smoked Haddies, Haddock and Halibut, in Digby Co			26,010 00
Albicores and Clams in Queen's Co			935 00
Total value of the Fisheries within the Dominion of Canada, 1881			$15,817,162 64
do do		1880	$14,499,979 71
Increase in 1881			$1,317,182 93

viii

from tabulating the value of individual fisheries in 1880. The figures for 1881 will serve the purpose. They show cod in the lead, followed by lobsters, herring, and mackerel.

Nova Scotia's fishery in 1880 had a product value of $6.3 million. Cod was most valuable at nearly $2.5 million; barrelled mackerel ($1.3 million) came second, followed by canned lobsters ($612,000), barrelled herring, haddock, fish oil, hake, pollock, and other products. The province employed 731 vessels with 6,748 men; and 11,210 boats with 22,798 men. The industry sold salmon fresh in ice as well as smoked, canned, and barrelled; and there was a small fresh fish trade at Digby and Halifax. The main trade was of course salt fish.

New Brunswick's fishery in 1880 was worth more than $2.7 million. The most valuable product was canned lobsters ($710,000), followed by barrelled herring, cod, hake, barrelled mackerel, fresh salmon in ice, smoked herring, sardines, and other products. The New Brunswick industry employed 220 vessels with 1,175 men, and 4,219 boats with 7,391 men.

Prince Edward Island's fishery yielded more than $1.6 million in value. Canned lobsters were even with New Brunswick at $710,000, followed by barrelled mackerel, cod, barrelled herring, barrelled oysters ($61,000), and other products. P.E.I.'s fleet had 32 vessels with 161 men, and 1,383 boats with 3,864 men.

Quebec's fishery in 1880 was worth more than $2.6 million, almost equal to New Brunswick's. Cod came to about $1.5 million; lobster to $76,400; herring to $73,800; seal skins to $25,600; whale oil to $5,400. The fleet had 166 vessels with 843 sailors; and 3,398 fishing boats with 10,692 fishermen and shoremen.

Ontario's fisheries in 1880 yielded products worth about $445,000. Whitefish were most valuable, followed by trout, herrings, pickerel, and sturgeon. (Overfishing would soon deplete most of these valuable species, with others coming to the front.) The Ontario fishery used 18 vessels with 54 men, and 865 boats with 2,076 men.

The Annual Report still gave no figures for the Prairie commercial fishery.

British Columbia's fisheries in 1880 were worth more than $713,000, less than five per cent of the Canadian marketed value. Canned salmon led at $401,000, followed by fur seal skins ($163,000), dogfish-seal-porpoise, and various other products including small amounts of halibut (fresh) and herring. The B.C. fishery used four steamers, ten schooners, 317 boats; and 93 cedar canoes in the sealing fleet.

All told, Canada's fishery in 1880 employed 8,757 men in 1,181 vessels, and 52,577 men in 25,266 boats. (The Annual Reports gave no figures for Manitoba, Saskatchewan, Alberta, and Yukon fisheries until 1886.)

By way of comparison, New England's vessel fleet in 1886 - many of whom still fished off Canada - had 1,956 vessels and 17,996 men. As outlined by Spencer Baird, there were 1,530 vessels in "food fish," 215 in shellfish and lobster, 177 in whales and seals, and 34 in menhaden.

Three decades later, in 1909-10, employment in the fisheries Outside Service had about doubled to 1,200, including 680 seasonal guardians and 255 men on the patrol fleet. This fleet now included 13 vessels and 255 men. Hatcheries now numbered 37, including establishments for salmon, lobster, whitefish, and pickerel, and employed more than 100 people. The amount spent on hatcheries in 1909-10, at $180,000,

COMPARATIVE TABLE showing the Number of Men Employed in the Fishing Industry in Vessels and Boats since the Year 1879 to 1890.

Years.	Number of Men in Vessels.	Number of Men in Boats.	Total Number of Fishermen.
1879	8,818	52,577	61,395
1880	8,757	51,900	60,657
1881	8,359	50,679	59,056
1882	8,498	52,785	61,283
1883	9,966	52,259	62,225
1884	9,968	51,854	61,822
1885	9,539	53,282	62,821
1886	8,927	53,073	62,000
1887	8,911	55,247	64,158
1888	9,574	53,109	62,683
1889	9,621	55,382	65,003
1890	8,726	55,000	63,726

This table of men employed in boats appeared in the 1890 Annual Report. Note the relative stability.

exceeded the total salaries of fishery officers.

The value of Canada's fisheries had increased from about $15 million to almost $30 million. Most of the increase, however, came from the British Columbia fishery. In 1880 it had produced a value of about $700,000; by 1909, it was more than $10 million, and about one-third of Canada's total fishery value. The prairie and Yukon fishery had gone from zero recorded to $1.4 million. Meanwhile, the Maritimes and Quebec had grown little, from about $13 to $16 million; this in spite of intervening growth in the lobster fishery.

In terms of products, the big change was that salmon now led by far in value, at more than $8 million. Cod came to $3.9 million. Lobster was close behind, with fresh lobster now taking one-third of the total trade. Although cod were still mostly salted, the fresh-fish trade was making some gains. The fresh haddock trade, at more than $300,000, was more than double the fresh cod trade. Haddock all told were worth $830,000, and hake $367,000. Herring, salted, fresh, and smoked, were worth more than $2.7 million, and sardines more than half a million. Beluga skins were worth $436,000; whale products more than $300,000; and eels more than $100,000.

Although the industry had some major new species, some older fisheries were stagnant or declining. Dried cod production was less than in the 1880's.

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COMPARATIVE TABLE showing Number, Tonnage and Value of Vessels and Boats engaged in the Fisheries of Canada, together with the Value of Fishing Materials employed, from 1880 to 1909.

Year.	Vessels.			Boats.		Value of Nets and Seines.	Value of other Fishing Material.	Total Capital Invested.
	No.	Tonnage.	Value.	No.	Value.			
			$		$	$	$	$
1880	1,181	45,323	1,814,688	25,266	716,352	985,978	419,564	3,936,582
1881	1,120	43,389	1,765,870	26,108	696,710	970,617	679,852	4,113,049
1882	1,140	42,845	1,749,717	26,747	833,137	1,351,193	823,938	4,757,985
1883	1,198	48,106	2,023,945	25,925	733,186	1,243,366	1,070,930	5,120,527
1884	1,182	42,747	1,866,711	24,287	741,727	1,191,579	1,224,646	5,014,663
1885	1,177	48,728	2,021,633	28,472	852,257	1,219,284	2,604,285	6,697,459
1886	1,133	44,605	1,890,411	28,187	850,545	1,263,152	2,720,187	6,814,295
1887	1,168	44,845	1,989,840	28,092	875,316	1,499,328	2,384,356	6,748,840
1888	1,137	33,247	2,017,558	27,384	859,953	1,594,992	2,390,502	6,863,005
1889	1,100	44,936	2,064,918	29,555	965,010	1,591,085	2,149,138	6,770,151
1890	1,069	43,084	2,152,790	29,803	924,346	1,695,358	2,600,147	7,372,641
1891	1,027	39,377	2,125,355	30,438	1,007,815	1,644,892	2,598,124	7,376,186
1892	988	37,205	2,112,875	30,513	1,041,972	1,475,043	3,017,945	7,647,835
1893	1,104	40,096	2,246,373	31,508	955,109	1,637,707	3,174,404	8,681,557
1894	1,178	41,768	2,409,029	34,102	1,009,189	1,921,352	4,099,546	9,439,116
1895	1,121	37,829	2,318,290	34,268	1,014,057	1,713,190	4,208,311	9,253,848
1896	1,217	42,447	2,041,130	35,398	1,110,920	2,146,934	4,527,267	9,826,251
1897	1,184	40,679	1,701,239	37,693	1,128,682	1,955,304	4,585,569	9,370,794
1898	1,154	38,011	1,707,180	38,675	1,136,943	2,075,928	4,940,046	9,860,097
1899	1,178	38,508	1,716,973	38,538	1,195,856	2,162,876	5,074,135	10,149,840
1900	1,212	41,307	1,940,329	38,930	1,248,171	2,405,860	5,395,765	10,990,125
1901	1,231	40,358	2,417,680	38,186	1,212,297	2,312,187	5,549,136	11,491,300
1902	1,296	49,888	2,620,661	41,667	1,199,598	2,103,621	5,382,079	11,305,959
1903	1,343	42,712	2,755,150	40,943	1,338,003	2,305,444	5,842,857	12,241,454
1904	1,316	43,025	2,592,527	41,938	1,376,165	2,189,666	6,198,584	12,356,942
1905	1,384	41,640	2,813,834	41,463	1,373,337	2,310,503	6,383,218	12,880,897
1906	1,439	40,827	2,841,875	39,634	1,462,374	2,426,341	7,824,975	14,555,565
1907	1,390	36,902	2,731,888	38,711	1,437,196	2,266,722	8,374,440	14,826,592
1908	1,441	40,818	3,571,871	39,965	1,696,856	2,283,127	7,957,500	15,508,275
1909	1,750	37,662	3,303,121	41,170	1,855,629	2,572,820	9,626,362	17,357,932

Numbers of vessels and especially of boats increased after 1890, as the Pacific and prairie fisheries hit their stride. The gas engine at the turn of the century aided the boat fleet.

RECAPITULATION of the Yield and Value of the Fisheries of the Dominion of Canada for the Year 1909-10.

No.	Kinds of Fish.	Quantity.	Value.	Total Value.
			$ c.	$ c.
1	Cod, dried ... Cwt.	814,041	3,753,626 00	
2	" fresh or green ... Lbs.	4,354,871	143,118 77	
3	" tongues and sounds ... Brls.	1,634	16,062	3,912,806 77
4	Haddock, dried ... Cwt.	111,705	361,649 00	
5	" fresh ... Lbs.	10,973,467	308,689 30	
6	" smoked (finnans) ... "	2,583,975	159,245 50	829,553 80
7	Hake, dried ... Cwt.	130,651	338,244 50	
8	" sounds ... Lbs.	100,218	29,195 00	367,439 50
9	Pollock ... Cwt.	121,265	325,533 50	
10	Tom Cod ... Lbs.	2,087,800	44,586 00	
11	Halibut ... "	23,232,308	1,210,486 00	
12	Flounders ... "	1,021,540	19,692 30	
13	Salmon, preserved in cans ... "	47,676,772	6,456,373 30	
14	" fresh ... "	7,418,869	660,210 85	
15	" smoked ... "	450,924	44,675 68	
16	" pickled and dry salted ... "	14,285,200	1,043,265 00	8,204,524 23
17	Trout, (all kinds) ... Lbs.	6,118,934	621,123 70	
18	Ouananiche ... "	30,000	3,000 00	
19	Whitefish ... "	12,405,423	1,060,126 48	
20	Smelts ... "	9,422,904	868,842 88	
21	Oulachons ... "	878,000	44,800 00	
22	Herring, salted ... Brls.	304,188	1,232,489 50	
23	" fresh ... Lbs.	79,944,217	1,155,307 84	
24	" smoked and kippered ... "	7,772,591	366,953 80	2,754,751 14
25	Sardines, preserved in cans ... "	3,569,300	178,465 00	
26	" fresh and salted ... Brls.	248,523	372,829 00	551,294 00
27	Shad ... "	5,343	57,039 20	
28	Alewives ... "	25,830	100,086 00	
29	Pike ... Lbs.	6,918,737	350,356 87	
30	Maskinongé ... "	7,700	714 00	
31	Eels, salted ... Brls.	6,965	68,939 00	
32	" fresh ... Lbs.	545,502	31,176 00	100,115 00
33	Perch ... "	1,137,976	55,902 00	
34	Pickerel ... "	9,276,627	685,493 50	
35	Bass ... "	249,625	28,595 50	
36	Mackerel, salted ... Brls.	43,427	578,607 00	
37	" fresh ... Lbs.	3,391,310	369,464 00	948,071 00
38	Sturgeon ... "	928,761	78,773 00	
39	" caviare ... "	12,915	13,815 00	92,588 00
40	Lobsters, preserved in cans ... "	9,071,600	2,721,478 60	
41	" fresh or alive ... Cwt.	103,947	935,668 00	3,657,146 60
42	Oysters ... Brls.	38,535	251,904 00	
43	Clams, quahaugs, scallops, etc ... "	94,435	341,978 50	
44	Squid ... "	12,321	43,333 00	
45	Coarse and mixed fish ... Lbs.	21,326,961	518,703 20	
46	Tullibee, carp and greyling ... "	1,675,020	87,529 16	
47	Fish used as bait ... Brls.	389,321	574,761 50	
48	" used as fertilizer ... "	503,135	257,455 50	
49	Fish oil ... Galls.	669,259	199,986 18	
50	Fur seal skins ... No.	3,742	123,486 00	
51	Hair seal skins ... "	12,878	11,785 00	
52	Sea otter skins ... "	18	12,600 00	
53	Beluga skins ... "	109	436 00	
54	Whale product ...		314,870 00	
55	Dulse, cockles, and other shell fish not mentioned above ...	230,800	11,918 00	
56	Swordfish ... Lbs.	146,611	13,696 77	
	Total value for 1909-10 ...			29,629,169 68

This table shows the total quantity and value of each kind of fish and fish product for the year 1909-10 in the whole of Canada.

Oysters too were well down. Lobsters were a well-known problem.

SOME PRODUCTION FIGURES BY PROVINCE FOR 1909-10

Nova Scotia's fishery for the 1909-10 fiscal year yielded $8.1 million, up less than $2 million from 1880. Dried cod was still the leader, worth the same as in 1880: $2.5 million. Canned lobsters were worth $1.1 million, live lobsters $771,000. Herring were now in third place (salted worth $564,000, fresh worth $166,000, smoked and kippered worth $43,000), followed by mackerel (salted worth $455,000, fresh worth $319,000). Other important products included haddock (fresh and smoked taken together now exceeded the value of dried haddock), pollock, hake, halibut, salmon, and a host of minor fisheries such as smelt, shad, flounders, and bait, oil, and meal. Swordfish was becoming important.

Nova Scotia now had 16,102 boats - a major increase. But the boat fleet employed 18,583 men - an actual drop in employment. The province now had 785 vessels, up from 731 in 1880; but they were employing only 4,575 men, a marked decrease. Production per man was up. Canneries and fish-houses employed 3,515.

New Brunswick's fishery value in 1909-10 had climbed to $4.7 million. Herring in all its forms -

RECAPITULATION showing the Total Value of the Fisheries in the respective Provinces of Canada, from 1870 to 1909 inclusive, as compiled from the Annual Reports of the Department of Fisheries.

Year.	Nova Scotia.	New Brunswick.	Prince Edward Island.	Quebec.	Ontario.	British Columbia.	Manitoba, Saskatchewan, Alberta and Yukon.	Total for Canada.
1870	$ 4,019,425	$ 1,131,433	$ No data.	$ 1,161,551	$ 264,982	$ No data.	$ No data.	$ 6,577,391
1871	5,101,030	1,185,033	"	1,093,612	193,524	"	"	7,573,199
1872	6,016,835	1,965,459	"	1,320,189	267,633	"	"	9,570,116
1873	6,577,085	2,285,662	207,595	1,391,564	293,091	"	"	10,754,997
1874	6,652,302	2,685,794	288,863	1,608,660	446,267	"	"	11,681,886
1875	5,573,851	2,427,654	298,927	1,596,759	453,194	"	"	10,350,385
1876	6,029,050	1,953,389	494,967	2,097,668	437,229	104,697	"	11,117,000
1877	5,527,858	2,133,237	763,036	2,560,147	438,223	583,433	"	12,005,934
1878	6,131,600	2,305,790	840,344	2,664,055	348,122	925,767	"	13,215,678
1879	5,752,937	2,554,722	1,402,301	2,820,395	367,133	631,766	"	13,529,254
1880	6,291,061	2,744,447	1,675,089	2,631,556	444,491	713,335	"	14,499,979
1881	6,214,782	2,930,904	1,955,290	2,751,962	509,903	1,454,321	"	15,817,162
1882	7,131,418	3,192,339	1,855,687	1,976,516	825,457	1,842,675	"	16,824,092
1883	7,689,374	3,185,674	1,272,468	2,138,997	1,027,033	1,644,646	"	16,958,192
1884	8,763,779	3,730,454	1,085,619	1,694,561	1,133,724	1,358,267	"	17,766,404
1885	8,283,922	4,005,431	1,293,430	1,719,460	1,342,692	1,078,038	"	17,722,973
1886	8,415,362	4,180,227	1,141,991	1,741,382	1,435,998	1,577,348	186,980	18,679,288
1887	8,379,782	3,559,507	1,037,426	1,773,567	1,531,850	1,974,887	129,084	18,386,103
1888	7,817,030	2,941,863	876,862	1,860,012	1,839,869	1,902,195	180,677	17,418,510
1889	6,346,722	3,067,039	886,430	1,876,194	1,963,123	3,348,067	167,679	17,655,256
1890	6,636,444	2,699,055	1,041,109	1,615,119	2,009,637	3,481,432	232,104	17,714,902
1891	7,011,300	3,571,050	1,238,733	2,008,678	1,806,389	3,008,755	332,969	18,977,878
1892	6,340,724	3,203,922	1,179,856	2,236,732	2,042,198	2,849,483	1,088,254	18,941,171
1893	6,407,279	3,746,121	1,133,368	2,218,905	1,694,930	4,443,963	1,042,093	20,686,661
1894	6,547,387	4,351,526	1,119,738	2,303,386	1,659,968	3,950,478	787,087	20,719,573
1895	6,213,131	4,403,158	976,836	1,867,920	1,584,473	4,401,354	752,466	20,199,338
1896	6,070,895	4,799,423	976,126	2,025,754	1,605,674	4,183,999	745,543	20,407,425
1897	8,090,346	3,934,135	954,949	1,737,011	1,289,822	6,138,865	638,416	22,783,546
1898	7,226,034	3,849,357	1,070,202	1,761,440	1,433,632	3,713,101	613,355	19,667,121
1899	7,347,604	4,119,891	1,043,645	1,953,134	1,590,447	5,214,074	622,911	21,891,706
1900	7,809,152	3,769,742	1,059,193	1,989,279	1,333,294	4,878,820	718,159	21,557,639
1901	7,989,548	4,193,264	1,050,623	2,174,459	1,428,078	7,942,771	958,410	25,737,153
1902	7,351,753	3,912,514	887,024	2,059,175	1,265,706	5,284,824	1,198,437	21,959,433
1903	7,841,602	4,186,800	1,099,510	2,211,792	1,533,144	4,748,365	1,478,665	23,101,878
1904	7,287,099	4,671,084	1,077,546	1,751,397	1,793,229	5,219,107	1,716,977	23,516,439
1905	8,259,085	4,847,090	998,922	2,003,716	1,708,963	9,850,216	1,811,570	29,479,562
1906	7,799,160	4,905,225	1,168,939	2,175,035	1,734,856	7,003,347	1,492,923	26,279,485
1907	7,632,330	5,300,564	1,492,695	2,047,390	1,935,025	6,122,923	968,422	25,499,349
1908	8,009,838	4,754,298	1,378,624	1,881,817	2,100,078	6,465,038	861,392	25,451,085
1909	8,081,111	4,676,315	1,197,556	1,808,436	2,177,813	10,314,755	1,373,181	29,629,169
Totals	$278,667,027	$138,060,602	$39,521,519	$78,309,382	$49,292,894	$128,365,112	$20,097,754	$732,304,312

salted, fresh, smoked and kippered, canned sardines, fresh and salted sardines - came to more than $1.3 million. Canned lobsters had slipped to $624,000; live lobsters were worth $146,000. Smelts were now worth more than cod. Other notable species included salmon, especially fresh, pollock, clams, oysters, sturgeon, etc.

As in Nova Scotia, the number of New Brunswick vessels and boats had increased remarkably (to 512 vessels, well over double, and to 8,414 boats, about double). Employment in both sectors increased, to 1,459 men on vessels and 13,366 on boats. The number of vessels increased faster than the number of men working on them. The fishery was producing no more per man, and less per craft. Nova Scotia had pulled ahead in production per man, less by increasing the output than by decreasing the number of men. New Brunswick's canneries and fish-houses employed 5,602, more than Nova Scotia.

Prince Edward Island's fishery in 1909-10 yielded production worth $1.2 million, well below that of 1880. Canned lobsters were worth $677,000, down somewhat; live lobsters were worth only $13,000. Oysters were up markedly to $94,600. Cod, hake, smelts, herring, mackerel, "clams, quahaugs, scallops, &c." and bait fish were also important to the island's small fishery.

Vessels now numbered 83, almost three times the earlier number of decked craft deserving to be called vessels, they carried fewer people; but they carried fewer people, 125. Boats now numbered 1,989, also a major increase, employing 3,278 men, a decrease. Canneries and fish-houses employed 2,429.

Quebec's fishery had also fallen in value, from $2.6 million to $1.8 million. Dried cod led at $803,000, followed by canned lobster ($282,000), bait fish, fresh salmon, salted mackerel, salted herring, fertilizer, oil, and other products.

Quebec now had 42 vessels employing 104 men, and 6,133 boats employing 10,691 men. (Insert more when get 1880 stats). Canneries and fish-houses employed 1,259.

Ontario's product value in 1909-10 came to $2.2 million, led by trout ($516,000), whitefish, fresh herring, pickerel, and pike. Sturgeon was still worth $33,000, and sturgeon caviar $8,700. Ontario had 145 vessels, mostly tugs, employing 708 men; and 1,623 boats employing 2,893 men. The Annual Report gives no figure for canneries and fish-houses; it may be that virtually all Ontario's fish were already going to the fresh market.

On the Prairies, Manitoba's fishery was now yielding products worth $1 million, led by pickerel, whitefish, coarse and mixed fish, and pike. The province had ten vessels, mostly tugs, employing 74 men, and 288 boats employing 565 men. Canneries and fish-houses employed 200. In Saskatchewan, production value came to $174,000, with whitefish far in the lead. The province had 565 boats employing 565 men, according to the statistics, and no employment listed in canneries and fish-houses. Alberta and the Yukon Territory had production of $196,000, again with whitefish in the lead. Alberta had 362 boats employing 732 persons, the Yukon 68 boats employing 136.

British Columbia's fishery production had become the biggest, at $10.3 million. Canned salmon alone came to $6.5 million, pickled and dry salted salmon to $1 million. Halibut were worth over a million dollars. Also important were fresh herring ($512,000), whale products ($315,000), coarse and mixed fish ($140,000), fur seal skins ($124,000), and oysters ($31,000), as well as fish oil and fertilizer.

The British Columbia fishery now had 173 vessels, including 32 sealing vessels, employing 886 persons; and 5,635 boats, employing 9,925 persons. Although not the most numerous, B.C.'s fleet was the most valuable, at $6.8 million. Canneries and fish-houses employed 8,689, far ahead even of New Brunswick, where sardine and lobster canneries abounded.

British Columbia and the West naturally led in fleet growth; although on the Atlantic as well, gas engines were letting more fishermen operate boats. The motorboat was fast displacing the sailboat in most Canadian waters.

In summary, fleet and shore employment changed as follows in the three decades:

1880: 1,181 vessels with 8,757 men
+ 25,266 boats with 51,900 men

Equalled: 26,447 craft with 60,657 men
(no figures for shore employment)

1895: 1,121 vessels with 9,804 men
+ 34,268 boats with 61,530 men

Equalled: 35,389 craft with 71,334 men
Shore employment came to: 13,030
Total employment came to: 84,364

1909-10: 1,750 vessels with 7,931 men
+ 41,170 boats with 60,732 men

Equalled: 42,921 craft with 68,663 men
Shore employment came to: 21,694
Total employment came to: 90,357

Although Canada's fishery now had nearly 50 per cent more vessels than in 1880, the vessel fleet employed fewer men. The boat fleet increased 63 per cent over the three decades; but its employment increased only 15 per cent. While the total number of vessels and boats increased by more than half, overall fishing employment increased only by ten per cent, as the average number of crew dropped. With engines doing more of the work, more fishermen were buying their own boats and operating with smaller crew, or as individuals.

As the fishery's value almost doubled over three decades, British Columbia led the way. The Fisheries Service also about doubled. But on the Atlantic, the fleet increased much faster than the value of the fishery. As J. J. Cowie wrote in the 1909-10 Annual Report, in his article on "The Non-Progression of the Atlantic Fisheries of Canada": "...We find that the fisheries of British Columbia and inland western waters have been giving us the increasing totals, and further that the aggregate value of the fisheries of the four eastern provinces has almost stood still for the last twenty-five years."

xliv *MARINE AND FISHERIES*

1 GEORGE V., A. 1911

COMPARATIVE TABLE showing the Number of Men enmloyed in the Fishing Industry since 1895.

Year.	Number of Persons in Lobster Canneries and Fish-houses.	Number of Men in Vessels.	Number of Men in Boats.	Total Number of Fishermen.	Total Number of Persons in Fishing Industry.
1895	13,030	9,804	61,530	71,334	84,364
1896	14,175	9,735	65,502	75,237	89,412
1897	15,165	8,879	70,080	78,959	94,124
1898	16,548	8,657	72,877	81,534	98,082
1899	18,708	8,970	70,893	79,893	98,601
1900	18,205	9,295	71,859	81,064	99,269
1901	15,315	9,148	69,142	78,290	93,606
1902	13,563	9,123	68,678	77,801	91,364
1903	14,018	9,304	69,839	79,134	93,152
1904	13,981	9,236	68,109	77,345	91,326
1905	14,037	9,366	73,505	82,871	96,908
1906	12,317	8,458	67,646	76,104	88,421
1907	11,442	8,089	63,165	71,254	82,696
1908	13,753	8,550	62,520	71,070	84,823
1909	21,694	7,931	60,732	68,663	90,357

NEWFOUNDLAND

In Newfoundland in 1880, the economy was mainly fish, and the fish were mainly cod. Both statements were still true in 1910; although in percentage terms, fish made up somewhat less of the general economy.

There is no consistent set of annual departmental reports comparable to the Canadian one for the

TABLE II.

Showing the amount of Fish Exported from Newfoundland from 1864 to 1876.

		1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876
Codfish, dried	Quintals	1016234	997114	930447	1066215	1169948	1204086	1213737	1328726	1221156	1369205	1609724	1136235	1364068
" Core Fish	"	408	6				2355	1942	640	730	1523	904	730	959
" Fresh frozen	"									358				
" Oil, crude	Tuns	2312	2816	3011	4183	3071	4528	3834	5238	4133	3054	2939	2900	2372
" Liver Oil, Refined	"	172	419	238	272	225	333	419	313	221	321	222	89	112½
" Roes	Barrels	8	1590	342	763	1092	964	1265	1939	910	858	1186	221	715
" Sounds and Tongues	Packages	455	924	485	816	500	1559	452	199	121	279	276	164	119
Haddock	Quintals	1024	608	457	1685	837	1719	28	630	12	1798	18	144	535
Ling	"	24												
Halibut	"	608	951	1424	1317	749	664	337	450	429	1848	1449	330	332
Herring	Barrels	40833	64946	203782	149776	187163	179440	146689	187439	140873	122608	183956	192639	291751
" frozen fresh	"	682	30							6898	10550	8300	14450	
" Smoked	"									14	200†			200
" Oil	Tuns	1½	61½	11⅓		34	30	2	20	50	78	20	20	19
Turbot	Quintals		15	5380*		32			20	5		13	15	
" Smoked	"												8	
Lobsters	Lbs.	20										25814	144723	6046
Salmon	Tierces	3115	3570	4319	5340	6503	9214	6551	3977	5049	7711	7883	8101	7448
" preserved in tins	Lbs.	23	990									36562	50120	50288
Trout	Barrels	729	324	305	1137		1528	1330	454	2189	1552	2234	1458	987
Caplin	Packages	405	534		75	915				147	135	51	57	306
Mackerel	Barrels	158	17		17	9		1019	1374	604	47	47		1
Dogfish Oil	Tuns	15	30		11		11	6	7	8	6	6	5	
Whale Oil	"	24	92	48	64	75	21		9	38	57	62	37	24
" Bone	Cwts		104	250		1						17	57	
Blubber and Dregs	Tuns	207	255	104		86	198	210	70	104	143	81	92	72
Seal Oil	"	1629	3267	4813	5142	4855	5580	6369	8504	4228	6835	4358	4971	4696
Seal Skins	Number	125950	242471	311265	389672	333316	363021	355428	537094	278372	463531	398366	346924	341811

* Number of Turbot.
† Barrels.

H.Y. Hind's report on the fisheries gave this table of Newfoundland exports

period 1880-1910. Hind gave the above table of exports for the years 1864 to 1876, apparently taken from Newfoundland government figures.

Leading exports in value in 1874 were dried cod ($6.1 million), seal oil ($610,000), cod oil ($470,000), pickled herring ($569,000), seal skins ($518,000), cod oil ($470,000), and salmon ($118,000).

Hind gives useful information on the Newfoundland and Canadian fleet and on employment as of 1874. There was little of a bank fishery.

In Newfoundland the DEEP SEA FISHERY, as distinguished from the fishery pursued in coastal waters, or within three Marine miles from the shore, has scarcely a separate existence. The vessels which are enumerated in the census are used chiefly for the purpose of sailing from one Coastal Fishery Station to another on the Island of Newfoundland, or for the Labrador Fishery. The total number of boats employed in the Shore Fishery was 18,611 in 1874 and 14,755 in 1869, and the number of persons engaged in catching and curing fish 45,854 in 1874 and 37,259 in 1869. The number of vessels was 1,197 during 1874, with a tonnage of 61,551 tons, manned by 8391 fishermen sailors. Sealers are included in the enumeration. The combined fishing industry of the Dominion and Newfoundland is thus represented:

Number of Boats.....38,852
Number of Vessels.....2,576
Tonnage of Vessels.....106,432
Number of persons engaged in catching and curing fish.....103,368

The appliances used in these Fisheries indicate, to a certain extent, their character. Where decked vessels are necessarily employed beyond the limit of three Marine miles from the shore, it is essentially a DEEP SEA FISHERY. Where open boats only are used, it is in general a COAST FISHERY, although, as in the case of Newfoundland, the depth of water near to the coast line may vary from 10 to 100 fathoms and more. Where the fishery is pursued from the shore, but with the use of open boats, as in the taking of Mackerel, Herring, and especially Caplin, Smelt and Launce, it is a STRAND FISHERY. Both the Deep Sea Fishery and the Coast Fishery are dependant in a very large measure on the Strand Fishery for Bait. The character of the Newfoundland fishery is further

indicated by the large number of Fishing Rooms, in actual use. [A fishing room was "a definite portion of the shore appropriated to the curing and storing of fish."] In 1874 these amounted to 8902 in number, in 1869 to 7,444.

Hind showed that Newfoundland was generally ahead of Norway in producing cod. Comparing the "cold water sea fisheries" of Newfoundland, Canada, and the United States, he found that "the mean annual yield of the Sea Fisheries of the United States, - the greater portion of the catch being made in waters off British American coast lines, - is not much more than half of the combined catch of the Dominion and Newfoundland."

About three and a half decades later, in 1910, Newfoundland exported 1.5 million quintals of dried cod, worth $7.3 million. Seal skins were worth $460,000, seal oil also $460,000. Canned lobsters, worth less than $3000 in 1876, now came to $338,000. Other leading exports by value were cod oil ($353,000), pickled herring ($157,000), whale oil ($147,340), bulk herring ($93,000), pickled salmon ($57,000), and frozen herring ($52,000). As in 1876, there were lesser amounts of other products such as trout, sounds and tongues, squid, and dried capelin.

The lobster fishery had canned 632,000 pounds in 1875; almost 6 million in 1880; almost 16 million in 1890; 8.3 million in 1900; 7.2 million in 1905; and 5.7 million in 1910, in which year the fishery had 2,081 licences, and 4,487 men. By 1915 production had dwindled to 1.4 million. By 1924 it dropped to 759,000. A three-year closure of the fishery followed, bringing some recovery.

The bank fishery, concentrated on the south coast, by 1910 appeared much stronger than in Hind's time. It now employed 101 boats and 1,567 crew. Vessel tonnage totalled 6,630 tons. Production of 144,500 quintals of dry fish averaged out to 92 quintals per man.

The Labrador fishery that year employed 1,126 schooners, 12,050 persons, and an estimated 3,000 cod traps. The Labrador coast itself had 750 liviers with 10 schooners and 150 traps. The steam sealing fleet had 19 vessels and 3,364 men, and took 333,000 seals. The annual report gave no figure for boats.

The labor force of men engaged in catching and curing fish numbered 38,578 in 1857; 45,854 in 1874; 36,694 in 1891; 41,231 in 1901; and 43,795 in 1911, apparently varying with the catch. Women (working at curing) were enumerated at 18,081 in 1891; 21,443 in 1901; and 23,245 in 1911. In 1857, the male fishing labor force made up 90.4 per cent of persons occupied; by 1911 it had dropped to 53.1 per cent.

Newfoundland's traditional cod fishery had reached its peak by the third quarter of the 19th century. From 1805 to 1880, the production of salt codfish generally ranged between 700,000 and 1.2 million quintals (a quintal being 112 pounds), with a gradual upward trend. After 1869, production was never below 1 million. In 1880 the production came to 1.4 million quintals, export value to $3.2 million. In 1909-10, production came to 1.5 million, export value to $4.9 million. But as the population increased, production per capita dropped. According to a study by Parzival Copes, fishery products in 1880 made up 90 per cent of Newfoundland's export value. In 1909/10, the fishery still provided 81 per cent of exports.

If Cowie had visited Newfoundland, he would have found it like the weaker sections of the Atlantic Canadian fishery. The "non-progression" of which he complained was even more evident. In the 1880-1910 period, Newfoundland had no fishery growth like that of the Prairies and B.C. to brighten the national picture; no developing fresh fish trade like the Maritimes; no new industry with the strength of the Maritimes' sardine and lobster industries.

The Newfoundland fishery was in a way holding its own; but by and large it was developing neither new fisheries, except for the already-weakening lobster fishery, nor new methods, except for the cod trap, which had many mainland forerunners. And Newfoundland was slow to develop alternate industries.

Bibliography

This Bibliography lists some of the more useful works consulted.

Alexander, David. *The Decay of Trade: an Economic History of the Newfoundland Saltfish Trade, 1935-1965.* St. John's, 1977.

- "Development and Dependence in Newfoundland, 1880-1970." *Acadiensis* 4 (1974): 3-31.

- "Newfoundland's Traditional Economy and Development to 1934." *Acadiensis* 5 (1976): 56-78.

- "The Political Economy of Fishing in Newfoundland." *Journal of Canadian Studies*, Vol. XI (Feb. 1976), Peterborough, Ont.

Anspach, Rev. Lewis Amadeux. *A History of the Island of Newfoundland...* . London: privately printed 1819.

Appleton, Thomas E. *Usque Ad Mare: A History of the Canadian Coast Guard and Marine Services.* Ottawa, 1968.

Balcom, B.A. *The Cod Fishery of Isle Royale, 1713-58.* Parks Canada, 1984.

- *History of the Lunenburg Fishing Industry.* Lunenburg, 1977.

Bartlett, Capt. Robert A. *The Log of Bob Bartlett...* . New York, 1928.

- "The Sealing Saga of Newfoundland." *National Geographic* 56 (1929): 91-130.

Bickerton, Carman. *A History of the Canadian Fisheries in the Georges Bank Area.* Ottawa, 1983. (Part of the Canadian Counter-Memorial submitted to the International Court of Justice in the Delimitation of the Maritime Boundary in the Gulf of Maine area.)

Bourne, N. *Scallops and the Offshore Fisheries of the Maritimes.* Bulletin 145, Fisheries Research Board of Canada, 1964.

Brebner, J. B. *The Neutral Yankees of Nova Scotia.* (2nd ed.) Carleton Library, No. 45, Toronto, 1980.

Brebner, J. B. *North Atlantic Triangle.* New Haven, 1945.

Brodeur, Nigel D. "L. P. Brodeur and the Origins of the Royal Canadian Navy." In *RCN in Retrospect, 1910-1968*, edited by James A. Boutilier. Vancouver, 1982.

Brown, Cassie. *Death on the Ice.* Toronto, 1972.

Brox, Ottar. *Newfoundland Fishermen in the Age of Industry: A Sociology of Economic Dualism.* St. John's, 1972.

Busch, Briton Cooper. *The War Against the Seals.* McGill-Queen's University Press, 1985.

Calhoun, Sue et al. *The Lockeport Lockout.* Halifax, 1983.

Campbell, B. A. *An Historical Review of Developments in Salmon Licensing up until 1968.* Internal paper, Fisheries and Marine Service, Department of the Environment, 1973.

Canada. Annual Reports, Department of Marine and Fisheries, Fisheries Branch, 1968-1914 and 1921-1930.

Canada. Annual Reports, Department of Naval Service, Fisheries Branch, 1914-1920.

Canada. Annual Reports, Department of Fisheries, 1930-1968.

Canada. *Commission of Conservation*, 1911. Ottawa, 1911.

Canada. *Commission of Conservation*, 1915. Toronto, 1916.

Canada, Province of. Annual Reports by Pierre Fortin in the Journal of the Legislative Assembly of Canada, 1852-1857.

Canada, Province of. Annual Reports, Commissioner of Crown Lands for the Province of Canada, 1858-1867. (These contain further information from Pierre Fortin.)

Canadian Fisherman. Gardenvale, Quebec. Numbers of the magazine from 1914 to 1955.

Carter, N. M. ***Index and List of Titles, Fisheries Research Board of Canada and Associated Publications, 1900-1964.*** Ottawa, 1968.

Cashin, Maj. Peter. ***My Life and Times, 1890-1919.*** Portugal Cove, Nfld.: Breakwater Books, 1976.

Centre d'etudes acadiennes. ***The Acadians of the Maritimes.*** Moncton, 1982.

Chambers, E. J. ***The Canadian Marine: A History of the Department of Marine and Fisheries.*** Toronto, 1905.

Coaker, W. F. ***The History of the Fishermen's Protective Union of Newfoundland.*** St. John's, 1920.

Condon, Michael E. ***The Fisheries and Resources of Newfoundland: "The Mine of the Sea"*** St. John's, 1925.

Dawson, S. E. ***The Saint Lawrence Basin.*** London, 1905.

Denys, Nicolas. ***The Description and Natural History of the Coasts of North America (Acadia).*** Toronto, 1908.

DeWolf, A. G. ***The Lobster Fishery of the Maritime Provinces: Economic Effects of Regulations.*** Ottawa, 1974.

Dorion-Robitaille, Y. ***Le capitaine J.-E. Bernier et la souverainete du Canada dans l'Arctique.*** Ottawa, 1978.

Dunfield, R. W. ***The Atlantic Salmon in the History of North America.*** Ottawa, 1985.

Earll, R.E. "The Sardine Industry", in ***The Fisheries and Fishery Industries of the United States,*** U.S. Fish Commission, 1887.

England, George Allan. ***Vikings of the Ice.*** New York, 1924. Reprint, ***The Greatest Hunt in the World.*** Montreal, 1969.

Fairley, H. S. ***Canadian Federalism, Fisheries and the Constitution: External Constraints on Internal Ordering.*** Thesis for LL.M degree at Harvard Law School. 1980.

Forester, A. and J. ***Fishing: British Columbia's Commercial Fishing History.*** Saanichton, B. C., 1975.

Gallant, Cecile and Arsenault, George. ***Histoire de la pêche chez les Acadiens de l'Ile du Prince Edouard.*** Summerside, 1980.

German, Andrew. "Fishing History, 1720-1930." ***Georges Bank.*** Woods Hole, 1987.

Goode, G. B. ***The Fisheries and Fishery Industries of the United States.*** Washington, 1887.

Gordon, H. S. "The Fishing Industry of Prince Edward Island." Report for Department of Fisheries, Ottawa, 1952.

- "The Economic Theory of a Common-Property Resource: The Fishery." ***Journal of Political Economy,*** Vol. 62. 1954.

Gough, Joseph. "Frankenstein's Seine." ***Canadian Fisherman,*** October and December, 1971.

Gough, Joseph. "Fisheries History." ***The Canadian Encyclopedia.*** Edmonton, 1985.

Gough, Joseph. "The Canadian Fishing Industry and Georges Bank." ***Georges Bank.*** Woods Hole, 1987.

Grant, Ruth F. ***The Canadian Atlantic Fishery.*** Toronto, 1934.

Great Lakes Fishery Commission. ***Commercial Fish Production in the Great Lakes 1867-1977.*** Ann Arbor, 1979.

- ***Lake Huron: The ecology of the Fish Community and Man's Effects on It.*** Ann Arbor, 1973.

- ***Lake Michigan: Man's Effects on Native Fish STocks and Other Biota.*** Ann Arbor, 1973.

- ***Review of Fish Species Introduced Into the Great Lakes, 1819-1974.*** Ann Arbor, 1985.

Gushue, Raymond. "The Territorial Waters of Newfoundland." ***Canadian Journal of Economics and Political Science,*** Vol. X, No. 3. Toronto, August 1942.

Hart, J. L. *Pacific Fishes of Canada*. Ottawa, 1973.

Hill, A. V. *Tides of Change: A Story of Fishermen's Co-operatives in British Columbia*. Prince Rupert Fishermen's Co-operative Association, 1967.

Hiller, James and Peter Neary. *Newfoundland in the Nineteenth and Twentieth Centuries: Essays in Interpretation*. Toronto, 1980.

Hind, H. Y. *The Effect of the Fishery Clauses of the Treaty of Washington on the Fisheries and Fishermen of British North America*. 2 parts. Study prepared for the Fishery Commission, Halifax, 1877.

Horizon Canada. This 120-installment series of magazine-style historical articles was published in Montreal, © 1985 (ISBN 2-89205-225-4). It contains many articles by experts on particular aspects of fisheries history.

Huntsman, A. G. "Fisheries Research in Canada." *Science* Vol. 98, No. 2536, 1943.

- "Edward Ernest Prince." *Canadian Field-Naturalist* Vol. 59, No. 1. 1945.

Innis, Harold. *The Cod Fisheries: The History of an International Economy*. New Haven, 1940.

- *Select Documents in Canadian Economics History 1497-1783*. Toronto, 1929.

- *Select Documents in Canadian Economics History, 1783-1885*. Toronto, 1933.

Jenness, Diamond. *The Indians of Canada*. (5th edition) Ottawa, 1960.

Jensen, Albert C. *A Brief History of the New England Offshore Fisheries*. U.S. Bureau of Commercial Fisheries, 1967.

- *The Cod*. New York, 1972.

Johnstone, Kenneth. *The Aquatic Explorers*. Toronto, 1977.

Joncas, L. Z. *The Fisheries of Canada*. London, 1883.

Judson, T. A. *"The Freshwater Commercial Fishing Industry of Western Canada."* Ph. D. thesis, University of Toronto, 1961.

Kennedy, W. A. *A History of Commercial Fishing in Inland Canada*. Fisheries Research Board of Canada, Manuscript Report Series. London, Ont.

Leach, J. H. and S. J. Nepszy. "The Fish Community in Lake Erie." *Journal of the Fisheries Research Board of Canada*. Vol. 33, No. 3. 1976.

Leim, A. H. and W. B. Scott. *Fishes of the Atlantic Coast of Canada*. Ottawa, 1966.

Lescarbot, Marc. *The History of New France*. Toronto, 1911.

Lounsbury, R. G. *The British Fishery at Newfoundland, 1634-1763*. New Haven and London, 1934.

Longley, R. S. "Peter Mitchell, Guardian of the North Atlantic Fisheries, 1867-1871." *Canadian Historical Review*, XXII. Toronto, 1941.

Lyons, Cicely. *Salmon: Our Heritage*. Vancouver, 1969.

MacCrimmon, H. R., J. E. Stewart, and J. R. Brett. *Aquaculture in Canada*. Ottawa, 1974.

MacKean, R. and R. Percival. *The Little Boats: Inshore Fishing Craft of Atlantic Canada*. Fredericton, 1979.

MacKenzie, W. C. and J. Gough. "Fisheries". *The Canadian Encyclopedia*. Edmonton, 1985.

MacNutt, W. S. *The Atlantic Provinces: The Emergence of Colonial Society, 1712-1857*. Toronto, 1968.

McDonald, Ian. *W. F. Coaker and the Fishermen's Protective Union in Newfoundland Politics 1908-1925*. Ph.D. thesis, University of London, 1971.

- *"W. F. Coaker and the Balance of Power Strategy: The Fishermen's Protective Union in Newfoundland Politics."* In Hiller and Neary, above.

Mercer, M. J. *Relations between Nova Scotia and New England 1815-1867: With Special Reference to trade and the Fisheries*. M.A. thesis. Dalhousie, 1938.

Morse, N. H. *An Economic Study of the Oyster Fishery of the Maritime Provinces*. Ottawa, 1971.

Moussette, Marcel. *Fishing Methods Used in the St. Lawrence River and Gulf*. Parks Canada. 1979.

Newfoundland. Annual Reports on the fisheries.

Noel, S. J. R. ***Politics in Newfoundland.*** Toronto, 1971.

North, George. ***A Ripple, A Wave: The Story of Union Organization in the B.C. Fishing Industry.*** Vancouver, 1974.

Nova Scotia. Department of Fisheries. ***Sea, Salt and Sweat.*** Halifax, 1977.

Ormsby, Margaret. ***British Columbia: A History.*** Toronto, 1958.

Pepper, D. A. ***"Men, Boats and Fish in the Northwest Atlantic: An Economic Evaluation."*** Ph.D. thesis, University of Wales. 1978.

Perley, Moses H. ***Reports on the Sea and River Fisheries of New Brunswick.*** Fredericton, 1852.

Prince, E. E. "The Fisheries of Canada." In 30th Annual Report, Department of Marine and Fisheries. Ottawa, 1898.

- The Biological Board of Canada. ***Fourth Annual Report of the Commission of Conservation.*** Ottawa, 1913.

- "Fifty Years of Fishery Administration in Canada." ***Trans. Amer. Fish. Soc.*** Vol. 50. 1921.

Proulx, Jean-Pierre. ***Whaling in the North Atlantic: From Earliest Times to the Mid-19th Century.*** Parks Canada. Ottawa, 1986.

Prowse, D. W. ***A History of Newfoundland from the English, Colonial, and Foreign Records.*** 1895. Reprint, Belleville, Ont. 1972.

Reid, J. H. Stewart, K. McNaught, and H. S. Crowe. ***A Source-Book of Canadian History.*** Toronto, 1964.

Ricker, W. E. ***The Fisheries Research Board of Canada - Seventy-five Years of Achievements.*** Ottawa, 1975.

Rigby, M. S. and A. G. Huntsman. Materials relating to the history of the Fisheries Research Board of Canada (formerly the Biological Board of Canada) for the period 1898-1924. Unpublished.

Royal Commissions, Inquiries, Task Force Reports, etc: the following lists in chronological order some of the more notable reports commissioned by the Canadian, Newfoundland (pre-Confederation) and provincial governments. The titles of these reports sometimes vary between the official long forms and the common title; and printing dates often differ from the date of the inquiry. Here I have used the most common title, and generally given the dates from the beginning of the inquiry until the report was presented.

Canada

British Columbia Fishery Commission Report, 1891-1892.

Report of the Dominion Fishery Commission on the fisheries of the Province of Ontario. 1892-1893.

Report of the Canadian Lobster Commission, 1898-1899. Commission to Inquire into the Herring and Sardine Industry of the Bay of Fundy, as well as into the Ravages of the Dog-fish and the General Condition of the Lobster Fishery at the Magdalen Islands, St. Mary's Bay and the Bay of Fundy. 1903-1905.

Commission to Investigate Grievances and Complaints existing in regard to Salmon and Lobster Fisheries in Gloucester County, New Brunswick. 1904.

Georgian Bay Fisheries Commission, 1905-1908.

British Columbia Fisheries Commission, 1905.

Manitoba Fisheries Commission, 1910-1911. (Interim report and final report; covered also Saskatchewan and Alberta.)

Report of Commander Wm. Wakeham, Special Commissioner and Inspector of Fisheries for the Gulf of St. Lawrence, in the Lobster Industry of the Maritime Provinces and the Province of Quebec. 1909-1910.

Commission to Inquire into the Number of Boats to be employed by Salmon Canneries in the Province of British Columbia. 1910. (The Boat-Rating Commission.)
Dominion Shell-fish Fishery Commission, 1912-1913.

Pelagic Sealing Commission. Commissioner's Report. 1913-1916.

Commission to Investigate a Scheme of Scientific Fishing for Sea Herring in the Atlantic Waters of the Dominion. 1915. (The Hjort expedition.)

Report of Special Fishery Commission. 1917-1918. (British Columbia fisheries - the Evans report.)

British Columbia Fisheries Commission. 1922-1923. (The Duff report.)

Report of the Royal Commission investigating the fisheries of the Maritime Provinces and the Magdalen Islands. 1928. (The Maclean report.)

Report of the Royal Commission on Price Spreads. 1934-1935.

Report relating to the use of (1) trap-nets at Sooke Area and (2) Purse-Seines in a portion of the Gulf of Georgia (Area No. 17) in salmon fishing in British Columbia.... 1939-1940.

Newfoundland Fisheries Development Committee Report. 1953. (The Walsh Report. Canada-Newfoundland sponsorship.)

Royal Commission on Canada's Economic Prospects: The Commercial Fisheries of Canada. 1955-1957.

Atlantic Salt Fish Commission. 1964-1965. (The Finn report.)

Report of Commission of Inquiry into freshwater fish marketing. 1965-66. (The McIvor report.)

Task Force on Atlantic Fisheries: Navigating Troubled Waters. Michael J. L. Kirby, Chairman. Ottawa, 1982. (The Kirby report.)

The Commission on Pacific Fisheries Policy: Turning the Tide: A New Policy for Canada's Pacific Fisheries. Peter H. Pearse, commissioner. Vancouver, 1982. (The Pearse report.)

Canadian Provinces, pre- and post-Confederation (except the United Canadas)

New Brunswick. Perley, Moses H. The Sea and River Fisheries of New Brunswick. Fredericton, 1852.

Manitoba. Report of the Commissioners appointed to Investigate the Fishing Industry of Manitoba. Winnipeg, 1933.

Manitoba. Report on the Commercial Fishing Industry of Manitoba. H. C. Grant. Winnipeg, 1938.

Nova Scotia. Bates, Stewart. Report on the Canadian Atlantic Sea-Fishery. (Part of the Royal Commission on Provincial Development and Rehabilitation.) Halifax, 1944.

Saskatchewan. Report of the Royal Commission on the Fisheries of Saskatchewan. Regina, 1947.

Newfoundland (pre-Confederation)

Reports of the Newfoundland Fishery Research Commission, vol. 1: A Survey of the Fisheries of Newfoundland and Recommendations for a Scheme of Research. Harold Thompson. St. John's, 1930. (The Thompson report.)

Report of the Commission of Enquiry, Investigating the Fishery of Newfoundland and Labrador Other Than the Sea Fishery. St. John's, 1937.

Rutherford, J. B., D. G. Wilder, and H. C. Frick. An Economic Appraisal of the Canadian Lobster Fishery. Ottawa, 1967.

Ryan, Shannon. "The Newfoundland Cod Fishery in the Nineteenth Century." MA thesis, Memorial University of Newfoundland, 1971.

- "The Newfoundland Salt Cod Trade in the Nineteenth Century." In Hiller and Neary, above.

Sabine, Lorenzo. *Report on the Principal Fisheries of the American Seas*. Washington, 1853.

Samson, Roch. *Fishermen and Merchants in 19th Century Gaspe*. Parks Canada. 1984.

Scott, A. and P. A. Neher, editors. *The Public Regulation of Commercial Fisheries in Canada. A Study Prepared for the Economic Council of Canada*. Ottawa, 1981.

Scott, W. B. and E. J. Crossman. *Freshwater Fishes of Canada*. Ottawa, 1973.

Shepard, M. P. *History of International Competition for Pacific Salmon*. Fisheries Research Board of Canada, Manuscript Report Series. Nanaimo, B.C. 1967.

Smallwood, J. R. *The Book of Newfoundland*. 2 vols. St. John's, 1937.

- *Coaker of Newfoundland*. London, 1927.

Smith, Nicholas. *Fifty-two Years at the Labrador Fishery*. London, 1936.

Story, G. M., W. J. Kirwin, and J. D. A. Widdowson, editors. *Dictionary of Newfoundland English*. Toronto, 1982.

"Symposium on Policies for Economic Rationalization of Commercial Fisheries." Special edition of the *Journal of the Fisheries Research Board of Canada*, Vol. 36, No. 7, July 1979. Notable articles by A. W. H. Needler, A. Scott, G. A. Fraser, and P.H. Pearse.

Tansill, C. C. *Canadian-American Relations, 1875-1911*. New Haven, 1943.

Templeman, Wilfred. *Marine Resources of Newfoundland*. Ottawa, 1966.

- *The Newfoundland Lobster Fishery: An Account of Statistics, Methods, and Important Laws*. Newfoundland Government, Department of Natural Resources, St. John's, 1941.

Thompson, P. "Institutional Constraints in Fisheries Management." *Journal of the Fisheries Research Board of Canada*, Vol. 31, No. 12. 1974.

Tomasevich, J. *International Agreements on Conservation of Marine Resources*. Stanford, 1943.

Tonnessen, J. N. and A. O. Johnsen. *The History of Modern Whaling*. Berkeley, 1982.

United States. *Reply of the Secretary of the Treasury to the resolution of the House of Representatives of December 14, 1886*. Washington, Government Printing Office, 1887.

United States Tariff Commission. *Treaties Affecting the Northeastern Fisheries*. Washington, 1944.

Wadden, R. N. *Department of Fisheries of Canada 1867-1967*. Reprinted from the 1967 Annual Review of the Fisheries Council of Canada.

Wallace, Frederick William. *In the Wake of the Wind Ships*. Toronto, 1927.

- *Roving Fisherman*. Canadian Fisherman, Gardenvale, Quebec, 1955.

- *Wooden Ships and Iron Men*. London, 1924.

Watt, John W. *A Brief Review of the Fisheries of Nova Scotia*. Nova Scotia, Department of Trade and Industry, 1963.

Western Fisheries. Fiftieth Anniversary Issue. Vancouver, September 1979.

Whitelaw, W. M. *The Maritimes and Canada before Confederation*.

Whiteley, Albert S. *A Century on Bonne Esperance*. Privately printed, n.d. Ottawa.

Some Notes on Sources

Annual reports of the Marine and Fisheries department were by far the main source for this study, throughout. The various royal commissions and special reports were also highly useful, and are probably the easiest place for researchers to start. Some other sources of special interest are as follows.

On the Atlantic, the U.S. Reply of the Secretary of Treasury is an excellent source on the 1880's fishery; and the U.S. Tariff Commission study is a major and little-known piece of work. Various reports in the DFO library in Ottawa, related to the Annual Reports, summarized the U.S.-Canada disputes of the late 19th century; they include a notable one by Venning. Innis is of course a fundamental source. Scott Balcom's study was most useful on the Lunenburg fishery. Brebner's superb ***North Atlantic Triangle*** includes, among other things, the passing reference to the emetic on page 19. Ken Johnstone's ***Aquatic Explorers*** was most useful for the Biological Board. Gordon's reports on the Patrol Service are of tremendous interest; and I am chiefly indebted to Brodeur's article for information on the patrol fleet in relation to the birth of the navy. Hind's report is fascinating on early science as well as the New England, Canadian, and Newfoundland fisheries. DeWolf's report provided much of my information on lobsters. The information on whaling owes a lot to various articles by Canadian experts in the Horizon Canada series; and similarly, the Canadian Encyclopedia gives useful background information on shipping and the timber trade. The Whiteley family's small volume is instructive about life on the Labrador. The 1937 Royal Commission on Newfoundland fisheries is an excellent survey; and for the general fishery economy in Newfoundland, much of the information comes from studies by David Alexander, Shannon Ryan, and Parzival Copes.

For freshwater fisheries, Fairley and Thompson are instructive on jurisdiction; as are various internal documents by S.Ozere and A.W. Tuomi. Judson's thesis is an essential work. The various studies and commissions by Manitoba and Saskatchewan governments were also useful. A.B. McCullough, again in Horizon Canada, gives a good précis on the Great Lakes fishery. And Leach and Nepszy's article is highly useful.

On the Pacific, the various royal commissions are an excellent and often entertaining source. The DFO library has shelves full of documentation on the Bering Sea conflict. A.V. Hill's book is excellent on the fishery from the fisherman's viewpoint. The special study by Blake Campbell is instructive on licensing, as are the early royal commissions. And Michael Shepard's study was useful on the international conflicts. Cicely Lyons's book - she was a long-time employee of B.C. Packers - is a fundamental work.

The full version of this book will footnote all the main sources.

Appendix

The Regulations and How They Grew

As shown on page 8 in the section, "The Atlantic", a single table in the 1886 Annual Report could summarize the main fishery regulations of the Dominion of Canada.

By 1911 a summary of jurisdiction and of principal laws and regulations took 30 pages. (By the 1980's, federal fishery regulations themselves took up some 400 pages.)

Following is the summary appearing in the *Commission of Conservation, Canada, 1911: Lands, Fisheries and Game, Minerals*. Although highly miscellaneous, the regulations have notable features, including frequent mention of licences; purse-seine restrictions; some licence limitation, as on drift-nets for salmon; some charging of licence fees by amount of gear; cannery licences conditional on sanitary conditions in B.C.; and area-based licences in B.C.

JURISDICTION OVER FISHERIES

FEDERAL JURISDICTION.—The Parliament of Canada has (a) exclusive legislative jurisdiction over all matters pertaining to "Sea Coast and Inland Fisheries."[a]

(b) exclusive competence to enact fishery regulations and restrictions.[b]

(c) the right to impose "a tax by way of license as a condition of the right to fish."[c]

Provincial Jurisdiction

The Legislatures of the Provinces have (1) all proprietary rights in respect of fisheries which they held before Confederation. This includes (by virtue of s. 92, item 13, B.N.A.Act) control of the manner by which a private fishery is transferred or disposed of, and the rights of succession in respect of it.[d]

(2) the exclusive power to make laws in relation to matters coming under the caption, "Direct taxation within the Province in order to the Raising of a Revenue for Provincial Purposes."[e]

This has been interpreted by the Judicial Committee of the Imperial Privy Council as empowering the Provinces to lay a tax on provincial fisheries in addition to any imposed by the Dominion Parliament.[f]

"Following the decision of the Imperial Privy Council, the licensing of the fisheries of the province of Ontario, together with those of the inland portions of the province of Quebec, was handed over to the local governments.[g]

By an alleged tacit agreement[h] between the Dominion and the Maritime Provinces, made shortly after the Imperial Privy Council decision, the Dominion was to administer the Fisheries Service as formerly, pending a submission to the courts of the rights as regards Federal and Provincial authorities in tidal waters and within the three-mile limit. The matter has dragged on and no test case was submitted till last autumn (1910) when the dispute as affecting British Columbia was considered by the Supreme Court. The case is still pending.

NOTE.—New Brunswick disputes this alleged tacit agreement and passed, in April, 1910, an Act in addition to "The Fisheries Act, 1903," whereby provincial permits are issued to non-resident anglers.

a British North America Act, s. 91, item 12.
b Decision of Judicial Committee of the Imperial Privy Council, Fisheries Reference, 1898.
c Ibid.
d Ibid.
e British North America Act, s. 91, item 2.
f Decision of the Imperial Privy Council, Fisheries Reference, 1898.
g Letter of Deputy Minister Desbarats to Hon. W. C. H. Grimmer, April 13, 1910.
h Desbarats to Grimmer, April 30, 1910.

SUMMARY OF PRINCIPAL LAWS AND REGULATIONS

BELOW is given a summary of the more important provisions of the Dominion and Provincial laws and regulations relating to fisheries. The Fisheries Act (*R. S., Canada, Chap. 45*), constitutes the basis for the administration of the extensive fisheries under the control of the Federal Government; but the regulations made from time to time by Order in Council have very materially changed the specific clauses of the Act as originally passed.

The Fisheries Act

Leases and Licenses

The Minister of Marine and Fisheries may issue leases or licenses to fish for a period not exceeding nine years. If a lease or license for more than nine years is required, it may be issued only under authority of the Governor in Council.

Whales

Licenses are required of all whaling boats and of all those engaging in the manufacture of whale oil or other commercial product obtained from whales.

Renewable nine year licenses may be granted.

No such license shall be granted till the Minister has

(a) approved of factory site.
(b) assurance of satisfactory conduct of the business.
(c) plans of machinery, etc., on file.

The license is forfeited for non-user in two years.

Fees: $800 for first year.
$1,000 for second year.
$1,200 for third and each ensuing year.

After the first two years the Governor in Council may exact two per cent. of gross earnings in lieu of fees.

Regulations may be made for the enforcement of the law by the Governor in Council.

No vessel shall kill a whale within half a nautical mile of another vessel.

Harpoons only are allowed in killing whales.

Exception as to Hudson Bay: The license fee payable for whaling boats hunting in Hudson bay or the waters north of the 55th parallel of n. latitude, if not so hunting in connection with a factory established in Canada, shall be $50 a year.

Cod — Mackerel, herring or caplin seines are not to be used for taking codfish. No codfish seine shall be of a less sized mesh than 4 in. in extension of the arms, and 3 in. in the bottom of the seine.

Seal — No one fishing with a boat shall wilfully disturb any sedentary seal fishery. Disputes between occupiers of seal fisheries regarding limits or manner of setting nets shall be summarily settled by a fishery officer or justice of the peace.

Salmon — Close season for net fishing:

Quebec and Ontario—July 31 to May 1.
New Brunswick and Nova Scotia—Aug. 15 to Mar. 1.
Prince Edward Island—Sept. 1 to Dec. 31.

In New Brunswick, Nova Scotia and Quebec, fly fishing is legal from Feb. 1 to Aug. 15, but in Cape Breton Island the season extends from June 1 to Sept. 26. Also, on the north shore of the St. Lawrence river, east of but not including the Natashkwan river; in the Rimouski river, Murray river, river du Gouffre and in the Jacques-Cartier river, Portneuf county, fly surface fishing is permitted from Feb. 1 to Aug. 31 inclusive.

Salmon fry, parr and smelt shall not be caught at any time.

Size limit for salmon and grilse, 3 lbs.

In British Columbia, licenses costing $50 each are required of those operating salmon canneries or salmon curing establishments for commercial purposes.

Net Regulations — Minimum size of salmon net mesh shall be 5 in. extension measure. Nets are to be used only in tidal water. Swing nets are prohibited.

Nets must be set 250 yards apart.

Drifting for salmon is prohibited, except when under license in New Brunswick and British Columbia.

Drift nets shall not obstruct more than one-third of the width of a river.

No salmon shall be caught within 200 yards of salmon spawning streams.

Taking or sale of salmon roe is prohibited except by permission, and for the special purpose provided for in this Act.

Trout — Trout close season:

Ontario—Speckled trout, Sept. 15 to May 1.
Salmon trout, Nov. 1 to 30.
Lake trout, Oct. 15 to Dec. 1.
Quebec—Salmon trout, lake trout or muskallunge, Oct. 15 to Dec. 1.
Speckled trout, Oct. 1 to Apr. 30.
Prince Edward Island—Any trout, Oct. 1 to Mar. 31.

Exceptions: Except in the tidal waters of Quebec on the north shore of the river St. Lawrence from the mouth of the river Saguenay to

Blanc Sablon, no one shall fish for or catch trout except by means of hook and line. But in Ontario such shall not apply to salmon trout.

Indians in Manitoba, Alberta, Saskatchewan, North West territories and Yukon may take speckled trout at any time for their own use.

Whitefish — Close season:

Ontario, Nov. 1 to 30. But in the waters of lake Erie bordering on the counties of Haldimand, Monck, Kent and Essex, and around Pt. Pelee island; as well as in the waters of lake St. Clair, bordering on the counties of Essex and Kent, the above close season is abolished so far as fishing for whitefish is concerned.

Quebec, Nov. 10 to Dec. 1.

Manitoba, Saskatchewan, Alberta, North West Territories and Yukon, Oct. 20 to Nov. 1.[a] Fishing by Indians shall be unrestricted if for domestic purposes.

Whitefish fry must not be destroyed.

Minimum size of nets:

Seines for whitefish must be at least 4 in. extension measure.

Gill-nets are not to be set within two miles of seining ground.

Lobster Fisheries — For canning or curing lobsters, a license from the Minister at the rate of $5 for the first 4,800 lbs. or fraction thereof, and $2 for each additional 4,800 lbs. or fraction thereof, is required.

Imported cases of lobsters must be stamped with the government label.

An annual return of fishermen, employees, gear, pack, etc., is required of each lobster factory on May 31 of each year under a penalty not exceeding $400.

Labels on empty cases must be obliterated within 7 days after the commencement of the close season.

Managers of lobster factories shall, on request of the Minister, keep and deliver over all eggs necessary for hatching operations.

Under certain conditions, pound licenses, costing $75 each, are required.

Possession of Fish — Selling or possessing fish caught during close season or in any manner prohibited by law, is illegal. Such fish may be confiscated by any customs officer, excise officer, police officer, constable or market clerk.

Particulars of such seizures shall be sent to the fishery officer in charge of the district.

[a] It should be noted that the close seasons now vary with the different sections of these provinces to which they apply.

Fishways — Every dam, slide or other obstruction across a stream shall, where the Minister so determines, be provided with an efficient fishway, the form, place and capacity of which shall be prescribed by a fishery officer. This shall always be kept open and shall be supplied with sufficient water during such period as the fishery officer shall determine.

The Minister may authorize the payment of one-half the expense of construction of fishways.

If necessary, the Minister may construct a fishway where needed and recover cost of same by legal action.

Injuring a fishway or obstructing the passage of fish in it, is prohibited.

General Prohibitions — Fishing in limits leased to another is prohibited, providing that, in waters leased for net-fishing, bait for codfishing may be taken, and angling for other purposes than for trade and commerce is allowed.

Seines or nets must not be so placed as to obstruct navigation, and boats must not wantonly injure or destroy fishing gear.

Stakes or timber used for placing nets shall be removed 48 hours after they have ceased to be used.

Main channels of streams shall not be obstructed by nets or any other fishing apparatus, and in every tidal stream at least two-thirds of the main channel at low tide shall be left open.

But eel weirs and mill-dams for catching eels shall be prohibited only when they interfere with other fisheries.

Killing fish passing through a fishway is prohibited.

The following nets are forbidden except on special license[a] for deep-sea fish other than salmon: bag-net, trap-net, fish-pound.

No person (Indians having a special permit excepted) shall use spears, grapnel-hooks, negogs, or nishagans to catch salmon, trout, lunge, maskinonge, winaniche, bass, barfish, pickerel, whitefish, herring or shad.

The catching or selling of the young of any fish is prohibited.

Seines for barfish shall have meshes of not less than 3 in. extension measure.

The distance between fisheries is to be regulated by fishery officers.

Box-traps in fascine fishery shall have across their ends a wire net, the meshes of which shall be at least 1 in. square.

Explosives and projectiles for taking fish of any kind are prohibited except for whales, porpoises and walruses.

No weir, net or fascine shall be so placed as to unduly obstruct the passage of fish.

Injury to Fishing Grounds and Pollution of Rivers — In any water where fishing is carried on, no one shall throw overboard any ballast, coal ashes, stones or other deleterious substance, nor leave or deposit on the beach of any tidal estuary between high and low water mark or within 200 yds. of the mouth of any salmon river, any offal or decaying fish.

No person shall knowingly cause or permit any lime, poisonous drugs or chemicals, mill rubbish or sawdust to be put in any water frequented by fish.

Fisheries officers shall have all the powers and immunities of justices of the peace.

Miscellaneous — The Minister may lease or set apart waters for artificial propagation of fish.

Leases or licenses for oyster beds may be issued for any term of years.

From 6 p.m. Saturday to 6 a.m. Monday all sedentary fishing stations, nets, seines, etc., shall be so fixed as to admit of the free passage of fish without danger of capture in non-tidal waters, and in tidal waters from the time of low water nearest 6 p.m. Saturday to the time of lowest water nearest 6 a.m. Monday.

In British Columbia, Manitoba, Alberta and Saskatchewan, all ditches or canals for irrigation or other purposes shall have over their entrances fish-guards or nets to prevent the passage of fish.

General Dominion Fishery Regulations[a]

Anglers' Permits — Foreigners wishing to angle for sporting fish in any of the inland waters of Canada must obtain from the Dominion authorities a permit costing $5.

Exceptions: In Ontario, Quebec, New Brunswick and Prince Edward Island these permits are issued by the provincial authorities.

Such permit allows a fishing line having not more than 3 hooks, to be used.

Size limit of fish for anglers:

Trout, 6 inches.
Salmon and Grilse, 3 lbs.

Anglers holding these permits may not sell fish caught with hook and line.

Soft-Shell Clams — Close season for export:

Quebec, Nova Scotia, New Brunswick, Prince Edward Island, May 1 to June 30.[b]

[a] Where not otherwise specified, these regulations are taken from the Order in Council of 12th September, 1907.
[b] Order in Council, Aug. 1, 1910.

Export of Trout — Speckled, river or sea trout taken in Ontario, Quebec, New Brunswick, and Prince Edward Island, are not to be exported from Canada; provided that 25 lbs. of such fish may be exported if accompanied by copy of the angler's permit or certificate from local fishery officer or station agent.

Lobster Fishery — Close seasons and size limits:[a]

For Charlotte and St. John counties, New Brunswick, June 30 to Jan. 5 inclusive; size limit, 4¾ inches.

For the county of Albert, New Brunswick, and the counties of Kings and Annapolis, Nova Scotia, June 30 to Jan. 14, inclusive.

For the county of Digby, Nova Scotia, June 16 to Jan. 5 at nine o'clock a.m.

For Nova Scotia from Yarmouth to Halifax counties, May 31 to Dec. 14.

For Nova Scotia from Halifax harbour to Red point, Cape Breton Island, July 1 to Mar. 31.

For Cape Breton Island from Red point to and around cape North and including cape St. Lawrence; also for the north shore of the gulf of St. Lawrence from and including the bay of Blanc Sablon westward to the head of tide, including the island of Anticosti: Aug. 1 to Apr. 30, inclusive.

For Magdalen islands, July 11 to Aug. 31, inclusive. But no one shall fish for lobsters at any time in the lagoons of these islands.

For a portion of Northumberland strait, Aug. 11 to May 24, inclusive.

For Prince Edward Island, except that portion of the coast extending from West point around the west, north and that portion of the south coast of the Province to cape Traverse: July 11 to Apr. 25, inclusive.

Places not otherwise specified, July 11 to Apr. 19, inclusive.

Except as otherwise provided, the size limit for lobsters shall not be less than 8 inches.

General Prohibitions — Berried or soft-shell lobsters must not be caught, or if caught, must be at once liberated alive.

Lobster traps are not allowed in water of the depth of 2 fathoms or less.

Lobster fishing gear shall not be set before 6 o'clock on the first day of the open season except as otherwise provided above.

Trawl lobster fishing is prohibited in Gaspe and Bonaventure counties.

No one shall purposely sell or purchase any broken up lobsters for canning purposes.

Lobster fishing gear shall not be set less than 100 yards from any stationary salmon net.

[a] Order in Council, Sept. 30, 1910.

No one shall boil lobsters on any ship or floating structure except under special license from the Minister.

All lobster traps constructed after Dec. 31, 1910, shall have the laths on them not less than 1½ in. apart and all netting used in said traps shall have meshes not less than 3 inches extension measurement; and no one shall fish after the said date with traps not constructed in accordance with these requirements. All lobster traps constructed before Dec. 31, 1910, may be used without being remodelled till Dec. 31, 1912, the burden of proof as to when such traps were constructed to rest on the person using them[a].

Oyster Fishing — Licenses are required from the Minister of Marine and Fisheries.

Close season: Apr. 1 to Sept. 30.

Size limit:

Round oysters, 3 in. in diameter of outer shell.

Long oysters, 3½ in. in diameter of outer shell.

A permit may be obtained to catch small oysters for planting beds.

Prohibitions:

(a) Sunday fishing; ice fishing; night fishing.
(b) Digging for mussel mud within 200 yards of live oyster bed.
(c) Digging for mussel mud—
  (i) in portion of Trout river, Prince Edward Island.
  (ii) in portion of Bedford river, Prince Edward Island.
(d) Use of rakes on beds prepared or planted by Department of Marine and Fisheries.
(e) Quahaug rakes, purchase power tongs and tongs other than those now in use in Prince Edward Island and New Brunswick.

Oyster reserves for artificial propagation:

1. Portion of York river, P.E.I.
2. Big Tracadie harbour, N.S.
3. Portion of Shediac harbour, N.B.

Quahaugs or Hard-Shell Clams — Licenses are required.
Open season: May, June and September.
Size limit: 2 in. in length.

Prohibitions:

(a) Rakes with teeth less than 2 in. apart.
(b) Fishing for clams on oyster areas, except where permitted by fishery officer.

[a] Order in Council, Dec. 13, 1910.

Special Dominion Regulations[a]

The following are special regulations promulgated from time to time by Order in Council, and apply to the fisheries in the various provinces of Canada.

Nova Scotia — The Minister may authorize the taking of bait for deep-sea fishing during weekly close time.

Close season for bass: Mar. 1 to Oct. 1, but hook and line angling is allowed at all times. Size limit: 2 lbs.

Cod — No fishing is allowed with seines within half a mile of where hook and line fishing is going on from boats.

Herrings — Net and seine fishing prohibited within 600 ft. of herring spawning grounds from June 25 to Aug. 25.

"Driving" with artificial light is forbidden.

Salmon — Close season: August 15 to March 1; but fly-fishing is permitted between Feb. 1 and Aug. 15 except in Cape Breton Island, where such fishing may be permitted from June 1 to Sept. 26.

In tidal waters, salmon fishing is not allowed from 6 p.m., Saturday, to 6 a.m., Monday; except in the estuary of Medway river, where the close time shall be from 6 p.m., Friday, to 6 a.m., Monday.

In non-tidal waters, 9 a.m., Saturday to 6 a.m., Monday.

Dams shall not be used with respect to the regulation of their discharge in order to facilitate the catching of salmon.

Shad and Gaspereaux — Close time:
Sunset Friday, to sunrise Monday.

Smelts — Close season: April 1 to July 1.

Seines are prohibited, also bag or gill-nets with meshes less than 1¼ in.

Bag-nets are prohibited except on special license from the Minister, when they may be used from Dec. 1 to Feb. 15.

Gill-nets are prohibited except on special license from the Minister, when they may be used from Nov. 1 to Feb. 15.

The use of drift-nets is prohibited for catching sturgeon.

Trout and Land-Locked Salmon — Close season: Oct. 1 to Mar. 31.
Only fishing with hook and line is allowed.
Ice fishing for speckled trout is prohibited.

[a] These regulations, except as otherwise specified, have been summarised from the Order in Council of Sept. 12, 1907.

On special permit from the Minister, trout may be caught for domestic use ten days after the expiry of the legal close season. Fee: 50c.

The export of trout is prohibited, except the usual 25 lbs. allowed each licensed angler.

Seines are not to be set within 100 fathoms of any licensed weir, trap or net.

In addition to these regulations, each fishing county in the Province has detailed local regulations governing fishing within its bounds.

New Brunswick — Licenses to take bait (during the weekly close time period) for the *bona fide* purpose of deep-sea fishing may be procured on the authorization of the Minister of Marine and Fisheries.

Bass — Striped,—close season: April 1 to Nov. 30.

Striped,—weight limit: 2 lbs. Anglers may take bass exceeding 2 lbs. in weight.

Fishing apparatus allowed:

Gill-nets (in Sept. only) having a mesh of over 5 in. extension measure.[a]

Only licensed nets; license fee, $1.

No fishing for cod with seines is allowed at less than half a mile from where fishermen are using hooks and lines from boats.

Herrings — No nets are allowed where herrings resort to spawn between June 25 and Aug. 25, nor within 1,000 feet of any licensed weir.

Flambeau or torch fishing is prohibited.

Licenses are required for weirs, engines or barricades used to catch herrings.

Salmon — Close seasons:
Aug. 15 to Mar. 1.

For fly fishing: Aug. 15 to Feb. 1.

In tidal waters: 6 p.m., Saturday, to 6 a.m., Monday.

In non-tidal waters: 9 p.m., Saturday, to 6 a.m., Monday.

Nets must be licensed at 3c. a fathom per annum. Owner's name must be on nets.

On payment of a fee of $1, a license may be issued to riparian settlers (British subjects) on a portion of the river St. John, permitting salmon fishing with 30-fathom nets each alternate fortnight from May 1 to Aug. 15.[b]

[a] Order in Council, Aug. 26, 1908
[b] Order in Council, June 5, 1903.

Shad and Gaspereaux Close time:
Sunset, Friday evening, to sunrise, Monday. In the St., John river and its estuaries: 6 p.m., Saturday, to sunrise Monday.

After June 30 in each year these fish may not be caught.

Seines are prohibited for catching these fish.

Smelts Close season:
Mar. 1 to June 30.

Prohibited gear:

Seines.

Bag-nets with meshes less than 1¼ in.

All bag-nets, except those used under license between Dec. 1 and Feb. 15.

Electric or other lights in connection with bag-net fishing.

Permits are granted only to resident British subjects on payment of a fee of $15.

Close season: June 1 to July 1.

Gear allowed: Nets with not less than 13 in. mesh.

Size limit: 4 ft. in length.

Sturgeon Close season:
June 1 to July 1, inclusive.

Net fishing for sturgeon must be licensed by the Minister. The minimum size of meshes of nets shall be not less than 13 inches, extension measure.

Net licenses shall be issued only to *bona fide* resident British subjects on payment of a fee of $15.

Size limit for sturgeon: 4 feet.

Close season: Oct. 1 to Mar. 31.

Trout and Land-Locked Salmon Prohibitions:
(a) All means of capture except hook and line.
(b) Ice fishing in all Canada.

Permits are granted to fish for trout to be used for domestic purposes, ten days after the close season.

Export of all speckled river and sea trout is prohibited, except 25 lbs., which must be accompanied by the fishery officer's or station agent's certificate.

Whitefish Close season: Oct. 1 to Dec. 31.

Voluminous special regulations apply to local fishing in the various counties of New Brunswick.

Prince Edward Island Permits to take bait during the weekly close time, such bait to be used for the *bona fide* purpose of deep-sea fishing, may be issued on the authorization of the Minister.

Cod Cod fishing shall not be carried on with seines at a less distance than one-half mile from any fishing ground where boat fishing is going on.

Eels Fishing for eels with torches is prohibited in salmon and trout waters during October, November and December.

Herring No seines or nets are allowed within 600 ft. of a herring spawning resort between June 25 and August 25.

No seines or nets are allowed within 600 ft. of any licensed weir or trap-net.

"Driving" for herring with artificial light is prohibited.

Smelts Close season: April 1 to July 1.

Seines are prohibited.

Bag nets must have meshes of not less than 1¼ in.

Gill-nets may be used only under special license from the Minister and then only from October 1 to March. 31.

Bag-nets may be used only under special license from the Minister, and then only from November 1 to February 15.

Fee $1.00; minimum sized mesh, 1¼ inches.

Trout Close season: October 1 to March 31.

Only hook and line is allowed for catching trout.

Ice fishing for speckled trout is prohibited.

Trout may be caught, under special permit, for domestic purposes for ten days after the close of the close season.

The fee for each such permit is 50c.

The exportation of speckled, river or sea trout is prohibited except the 25 lbs. allowed each licensed angler.

Quebec The Minister may issue permits for taking deep-sea fishing bait during the prescribed weekly close time.

Bass Close time: Apr. 1 to June 15.

Size limit: Black bass, 9 inches.
Rock bass, 6 inches.

Gear allowed: Only hook and line.

Cod Fishing with seines is not allowed within half a mile of where hook and line fishing is going on.

Cod fishing in gulf of St. Lawrence (Quebec):

Licenses are required for trap-net fishing, except at a distance of 1,000 yards from shore, or from any similar net set from the shore.

Cod traps are not to be set at mouths of rivers frequented by salmon.

Trap-nets are to be 250 yards apart, or farther, if so directed by the fishery officer.

If the leader of any trap-net extends from the shore any fishery officer may determine, in writing or orally, the length of leader to be used.

Size of trap-net mesh allowed: pot, 4 inches; leader, 6 inches.

Fee for trap-net license: 50c for each fathom in leader.

Jiggers are prohibited.

Inhabitants of the United States fishing with trap-nets in Canadian waters may, in the exercise of their rights under the Treaty of 1818, be granted a license, subject to compliance with the usual rules and regulations.[a]

Deep-Sea Fisheries—Magdalen Is. From May 1 to June 15, it is unlawful to set herring and mackerel nets opposite Amherst harbour, the middle of Sandy Hook channel or the northern and western shores of Entry island at more than one mile from shore; provided, however, that nets may be set from Allright and Grindstone islands toward Entry island to within one-half mile of those set upon the north and west shores of said island. Nets in bays are not to be set closer than 10 feet.

Set lines and bultow lines for cod or halibut are prohibited in Pleasant bay.

Eels Maximum size mesh of net or trap: 1½ in. bar measure. No leader of an eel trap or weir shall exceed the height of the pot of said trap or weir.

Size limit: 30 inches.

Herring Trap-nets: Fishing with trap-nets without a license is prohibited in the gulf of St. Lawrence, except at a distance of 1,000 yards from the shore, or from any similar net set from the shore.[b]

Trap-nets are not to be set near the mouth of any river frequented by salmon.

Trap-nets are to be placed at least one-eighth of a mile apart unless a longer distance is required by the fisheries officer.

[a] Order in Council, Jan. 21, 1911.
[b] Order in Council, Jan. 21, 1911.

If the leader of a trap-net extends from the shore, any fishery officer may determine, orally or in writing, the length of the leader that may be used.

Fee: 50c per fathom of leader.

Seines are prohibited on the north shore of the St. Lawrence in the county of Saguenay from Kegashka to cape Whittle.

The same privileges are accorded inhabitants of the United States under the Treaty of 1818 as in the case of fishing for cod.

Maskinonge Close season: Apr. 15 to June 15.
Size limit: 24 inches.

Ouananiche Close season: Oct. 1 to Nov. 30.
Seines and nets are prohibited.

Pickerel Close season: Apr. 15 to May 15.
Size limit: 15 inches.

Net Fishing Net fishing is prohibited in Iroquois river and in the lakes and tributary streams thereof in the counties of Missisquoi, (except Missisquoi bay), Shefford, Brome, Drummond, Richmond, Wolfe, Sherbrooke, Stanstead, Compton, Megantic and Beauce.

Night lines in a prohibited district must not have more than 100 hooks on each.

Net fishing is prohibited in Two Mountains, St. Francis and St. Louis lakes, including Caughanawaga, Chateauguay, Jesus and des Prairies rivers and the outlets of the Ottawa.

Fishing with seines and nets is prohibited during July and August in the St. Lawrence river from the eastern boundaries of Champlain and Nicolet to the international boundary line. This also includes tributaries in the said district.

Reserves:

Propagation of Fish (1) North, Salmon, Magog, Massawippi rivers, tributary streams of L. Massawippi and portions of Negro and Tomifobia rivers. Hook and line fishing is allowed in these streams from May 14 to Oct. 10.

(2) Brome lake from May 1 to June 15. During the open season only fishing with hook and line and trolling with a spoon are allowed.

(3) Portions of Rivière du Sud, Escoumains, Patapidia, Kedgwick rivers, Mowat lake and the Government salmon fishing stations of Tadoussac.

Salmon — Close season: (1) July 31 to May 1; but fly-fishing is allowed from Feb. 1 to Aug. 15.

Fly fishing is permitted from Feb. 1 to Aug. 31, along the north shore of the gulf of St. Lawrence east of Natashkwan, Rimouski, Murray, du Gouffre and Jacques-Cartier rivers.

(2) No fishing is allowed in tidal waters from 6 p.m. Saturday to 6 a.m. Monday.

Smelts — Close season: Apr. 1 to June 30.

Nets: Bag-nets with meshes less than 1¼ inches are prohibited. Bag-nets must be licensed and may be used only from Dec. 1 to Feb. 15.

Seines are prohibited.

Exceptions:

(a) Gaspe county and those portions of Bonaventure county without railway communication, in which places seining is allowed from Oct. 1 to the close of navigation.
(b) Bag-net fishing is prohibited within the above limits.
(c) Under special permits, seining is allowed on the coast of Saguenay county from Bersimis to Natashkwan, from Oct. 1 till the close of navigation.

Sturgeon — Bare hooks, grapnels and spears are prohibited.
Close season: June 1 to 30.
Size limit: 36 inches.

Trout — Close season:

Grey or lake trout and land-locked salmon, October 15 to Dec. 1.

For speckled trout, Oct. 1 to Apr. 30; except in tidal waters on the north shore of the river St. Lawrence from Saguenay river to Blanc Sablon, no one shall catch trout by other means than hook and line.

Ice-fishing for speckled trout is prohibited.

No export is allowed of speckled river or sea trout, except the 25 lb. permitted by law.

Whitefish — Close season: Nov. 10 to Dec. 1.

Ontario — Bass.—Close season: Apr. 15 to June 15.

Exceptions: in western lake Erie the close season is from May 25 to July 15.

Minimum day's catch: 8 small-mouthed or large-mouthed black bass.

Minimum size: 10 inches.

Sale or export is prohibited for five years from May 30th, 1909, except the catch of two days' fishing, which is allowed to licensed anglers.[a]

Leases or licenses are required for fishing in the Province with nets or other apparatus.

Maskinonge — Close season: April 15 to June 15.
Maximum day's catch: four.
Size limit: 24 inches.

Sale and export prohibited for five years from May 30, 1909, except the two days' catch allowed to a licensed angler.[a]

Pickerel — Close season: April 15 to May 15, but the close season is abolished in Lambton county, on the shores of lake Huron and St. Clair river.

Maximum day's catch: twelve.

Size limit: 15 inches.

Bay of Quinte Restriction — Fishing is prohibited between Green bay and Deseronto during June, July and August.

Speckled Trout — Close season: September 15 to April 30.
Maximum day's catch: thirty.

Maximum weight of day's catch: 10 lbs.

Size limit: 6 inches.

Sale and export is prohibited for five years from May 30, 1909, but two days' catch may be taken out of the country by a licensed angler.[a]

The use of snares for fishing is prohibited in the Province.

Whitefish and Salmon Trout — Close season: Nov. 1 to 30; but this close season is abolished in lake Erie bordering on the counties of Haldimand, Monck, Kent and Essex and around Pelee island, as well as in the Detroit river and lake St. Clair, bordering on the counties of Essex and Kent.

Fish culture — Salmon Reserves:

Portions of the waters of

(a) Credit river.
(b) Highland creek.
(c) Lyons creek.
(d) Barber creek.

a Order in Council of Feb. 16, 1909.

General reserves:(1)

Portions of the waters of

(a) Grand river, near Galt.
(b) Trent river.
(c) Grafton creek.
(d) Baldwins creek.
(e) Duffins creek.
(f) Rouge river.
(g) Burlington bay (Kerrs pond).
(h) Little lake, in lake St. Clair.
(i) Clear lake, Salmon-Trout lake with tributaries, Stony lake, Jack and Eel creeks.
(j) Georgian bay, from Grondine point to and including the mouth of the French river and extending into the bay four miles from the shore line.[a]

Manitoba and Keewatin[b] — A license from the Minister is required of all persons fishing with nets or other apparatus. Such licenses are granted only to British subjects resident in Manitoba or Keewatin, or to Canadian firms with headquarters there.

Any resident settler or Indian may secure a free annual fishing permit allowing the use of not more than 100 yards of gill-net for domestic use; but such licenses must not be sold or bartered. Neither shall any license be transferable without the written permission of the local inspector of fisheries.

Only licensees may operate gill-nets.

Gill-nets and baited hooks are the only apparatus allowed.

Anglers permits are issued as under the general regulations.

Fishing in Lake Winnipeg — Summer Fishing.—The summer fishing season, when fishing may be carried on under tug, sail-boat or skiff licenses only, extends from June 1 to Aug. 15, inclusive.

Licenses:

(a) A tug license costs $50 and allows the use of not more than 5,000 yards of gill-net.
(b) A sailboat license costs $10 and allows the use of not more than 3,000 yards of gill-net.
(c) A skiff license costs $5 and allows the use of not more than 1,500 yards of gill-net.

a Order in Council of Feb. 16, 1909. This reserve is set apart for securing an adequate supply of fish eggs for artificial breeding purposes.

b Order in Council of May 1, 1911. Previous to this date, one set of regulations applied to Manitoba, Saskatchewan, Alberta, the North West Territories and the Yukon. As a result of the forthcoming findings of the Alberta and Saskatchewan Fisheries Commission, a new set of regulations for the Western provinces, other than Manitoba, will doubtless be formulated.

The mesh of such nets shall be, till June 1, 1913, not less than 5¼ inches, extension measure; thereafter, till June 1, 1915, not less than 5½ inches; and thereafter not less than 5¾ inches.

Limitation of Whitefish Catch.—During the summer commercial season not more than 2,500,000 lbs. of dressed whitefish shall be caught.

A sturgeon gill-net license for summer fishing costs $3 and allows the use of not more than 300 yards of net, the mesh of which shall not be less than 14 inches, extension measure.

A cat-fish gill-net license costs $3 and allows the use of not more than 1,500 yards of net, of not less than 5¼ inches mesh, extension measure.

Winter Fishing.—Gill-net season: Nov. 20 to Apr. 30, inclusive.

Whitefish gill-net licenses cost $5 and allow the use of not more than 1,500 yards of net. The mesh of this net shall not be less than 5¼ inches, extension measure, until Mar. 1, 1913; thereafter, until Mar. 1, 1915, 5½ inches; and after that date 5¾ inches.

Pickerel gill-nets: Fee, $5.
Length of net allowed, 1,500 yards.
Minimum size of mesh, 4¼ inches.

Tullibee, goldeye or jackfish licenses:
Fee, $5.
Length of net allowed, 1,500 yards.
Minimum size of mesh, 4 inches.

Fall Fishing.—Gill-nets are allowed from Sept. 1 to Oct. 15, inclusive for 1911 only. Thereafter, no fall fishing shall be permitted.
Pickerel gill-net license: Fee, $3.
Length of net allowed 1,500 yards.
Minimum size of mesh, 4 inches, extension measure.

Red River — Drag-seines are allowed only in 1911, and then only from July 20 to Aug. 31, inclusive. Drag-seine licenses cost $25 and allow the use of not more than 66 yards of net, having a minimum sized mesh of 3 inches, extension measure.

Jackfish or grass-pike license:
Fee, $2.
Allows fishing from Nov. 20 to last day of February inclusive.
Length of net allowed, 500 yards.
Minimum size of mesh, 3¾ inches, extension measure.

Lakes Winnipegosis and Waterhen — Gill-nets are permitted for winter fishing from Nov. 20 to the last day of February, inclusive.

Whitefish gill-net license:
Fee, $5.
Length of net allowed, 1,500 yards.
Minimum size of mesh, the same as for lake Winnipeg, as stated above.

Pickerel gill-net license:
Fee, $5.
Length of net allowed, 1,500 yards.
Minimum size of mesh, 4½ inches, extension measure.

Jackfish gill-net license:
Fee, $5.
Length of net allowed, 1,500 yards.
Minimum size of mesh, 4 inches, extension measure.

In Dawson bay and in lake Winnipegosis north of a line drawn east and west from the north end of Birch island, no nets less than 5½ inches, extension measure, shall be allowed.

Lake Manitoba — Gill-nets are allowed for winter fishing from Nov. 20 to the last day of February, inclusive.

The regulations concerning the use of pickerel and jackfish gill-nets are the same as for lakes Winnipegosis and Waterhen.

In lake Dauphin the regulations applying to the use of gill-nets for winter fishing and to jackfish gill-nets are the same as for lake Manitoba.

Lac du Bonnet — Sturgeon gill-net and baited hook licenses cost $5, and allow the use of not more than 200 yards of net and 200 baited hooks. The mesh shall not be less than 11 inches, extension measure.

A license costing $2 may be issued to authorize the use of not more than 200 baited hooks for any part of Manitoba or Keewatin.

Close seasons:
Pickerel, goldeyes, pike and jackfish: Apr. 15 to June 20, inclusive.
Whitefish and trout: Sept. 15 to Nov. 19, inclusive.
Sturgeon: May 15 to June 15, inclusive.

Seines, nets and other apparatus shall be so fixed as to allow the free passage of fish from 6 p.m. Saturday to 6 a.m. Monday.

So far as apparatus, close seasons, length and mesh of nets and license fees are concerned the regulations applying to the different fisheries of lake Winnipeg shall apply also to those in Keewatin district.

Prohibitions — The following prohibitions are established:
Fishing for sale or commercial purposes from 1911 to 1913 in Shoal, St. Martin, Pine island and Playgreen lakes.

Fishing in lakes Winnipegosis, Manitoba and Dauphin from Mar. 1 to Nov. 19, inclusive.

Pound-nets, trap-nets and bare unbaited hooks or grapnels.

Drag-seines after Aug. 31, 1911.

Only angling is allowed within 500 yards from the entrance piers at the lower end of the lock and the upper end of the lock canal at St. Andrews rapids.

Summer commercial fishing in portions of lake Winnipeg and its tributary waters.

Pickerel nets north of a line drawn from Flour point to Wicked point.

A portion of lake Winnipeg is set aside for hatchery purposes.

British Columbia[a] — Abalone:
Size limit, 4 in. across shortest diameter of shell.
Close season, the year 1911, and every third year thereafter.
Fee for license, $10

Clams — License fee: $2.

Crabs — Size limit, 6 in. long diameter.
Fee, $2.50.

Export of Fish — Export to foreign countries of fresh clams and other edible shellfish (but not oysters) is prohibited.

The export of sockeye salmon is prohibited unless they are in a frozen, canned, salted, smoked or cured condition.

The export is prohibited of fresh herring from British Columbia, or of herrings salted for less than nine days, or of herring intended for curing, canning or making oil or fertilizer outside of Canada.

But fresh herring taken in gill-nets may be exported in a fresh unsalted condition for immediate consumption.

Fraser River Channel — No net shall be allowed to drift on the channel side of the river within 100 yards of the line of buoys between the lightship at the head of Sandheads and Stevenson. In other portions of the channel, nets must be hauled in to let steamers pass.

Herring or Pilchard — Close season: Mar. 1, to Apr. 30. The season may commence at an earlier date at the discretion of the fishery officer in the locality.

Nets: Only gill-nets, drift-nets and drag-nets are allowed. Drift or gill-nets are not to exceed 200 fathoms in length.

Minimum size of mesh, 2½ in.

Fee for drift or gill-net, $2.50.

[a] Order in Council of Mar. 12, 1910.

Drag-seines are not to exceed 100 fathoms in length, and the mesh shall be not less than 1 in. in diameter.

Fee for drag-seine, $50.

Halibut — Close season: Mar. 1 to 31.

Leases or Licenses — Licenses are required for fishing with nets or other apparatus and also for taking shell-fish.

Licenses are granted only to British citizens resident in British Columbia or to Canadian companies licensed to do business in British Columbia.

Licensees must make return of catch to fishery officer.

Gill and drift-net licenses can be transferred only with the fishery officer's permission; all other licenses only with approval of the Minister.

Indians, with the fishery officer's permission, may fish anywhere at any time to obtain fish for their own food. But they must not spear, trap or pen fish on the spawning grounds or in reserves set apart for fish culture.

Salmon canneries and curing establishments must have a license. Fee: $50.

These licenses are conditional on the favourable report of the Fishery Inspector respecting the sanitary condition of the establishment.

Marking Boats and Nets — Each net and boat must be marked with its license number and each boat also with its owner's initials.

Other Fish — The fee for a license for catching other fish than those named in the Regulations shall be $1.

Oysters — Fee for license to fish on natural areas: $2.50. Fee for license covering a term of years, $2 per acre per year.

Close period: May to August inclusive.

Prohibitions — 1. Salmon gill or drift-nets cast from a boat nearer than 100 yards from one already in the water.

2. Sunk salmon nets and diver salmon nets.

3. More than one net operating under one license.

4. The use of a gill-net by anyone other than the licensee.

5. Salmon gill-net licensees fishing in a district other than the one for which their license was granted, unless the endorsation of the second fishery officer is obtained.

6. Nets enclosing any bay, cove, creek or inlet. At least one-third of the width of such indentation must remain open.

7. The use of salmon purse-seines in any harbour or area specified by the district inspector of fisheries.

8. A greater length of net by any fishing boat than is permitted by the license thereof.

9. The use of nets for taking fish in all the fresh water lakes or non-tidal waters of British Columbia.

10. Use of bare, unbaited hooks or grapnels for sturgeon.

11. Introduction of non-indigenous or non-native fish into British Columbia waters, except by permission of the Minister.

Prohibited Areas — Net fishing is prohibited in:
(a) A portion of Victoria harbour.
(b) Nanaimo harbour and Departure bay, except herring gill-nets; provided that in Departure bay, drag-seines may be used if operations are suspended between 7.30 a.m. and 5 p.m. and a weekly close time from 5 p.m., Saturday, to 7.30 a.m., Monday, is observed.

Smelt and Sardine — License fee: $1.
Nets allowed: Gill and drift.

Salmon — Nets allowed: Drift or gill; drag-seines, purse-seines, trap-nets.

Size of nets: 150 fathoms long and 60 meshes in breadth; 7 in. mesh.

For sockeye salmon, 5½ in. mesh is allowed. But north of the 51st parallel of north lattitude, salmon drift or gill-nets of 200 fathoms length and 50 meshes breadth may be used.

Fee for salmon gill-net or drift-net license: $5.00.

Drag seines shall not exceed 300 fathoms in length and the mesh shall be 3 in. Fee for same: $25.

Purse-seines shall not exceed 500 fathoms in length; mesh to be 3 in. No license for same shall be issued for any harbour or reserved area. Fee: $50.

Trap-net: Must be located on definite site and at least 400 fathoms from nearest adjacent trap. Meshes are to be not less than 6 in. leader and 2 in. heart. Fee: $75.

Only resident British Columbia subjects are allowed to fish for sockeye salmon in the Fraser river from New Westminster bridge to Mission bridge. Close season for salmon:

For sockeyes, Oct. 1 to June 30.

Exceptions: North of 51st parallel of north latitude, where close season shall be from Oct. 1 to June 19; and during such season no salmon, gill or drift-nets of less than 7 in. mesh shall be used. But

no nets are to be used at all in the Fraser river from Point Grey to the 49th parallel of north latitude from Aug. 25 to Sept. 15.

For spring salmon or quinnat, Oct. 1 to Nov. 15.

For coho, dog or humpback salmon, Nov. 15 to Jan. 1.

Size limit for net fishing: 3 lbs.

Steelheads

Close Season:
Non-tidal waters, Nov. 15 to Mar. 25.
Tidal waters, Jan. 1 to Mar. 25.

Sturgeon

Only gill-nets and drift-nets are allowed for capturing sturgeon. These are not to be more than 150 fathoms long and are to have meshes not less than 12 in. in diameter.

Fee: $2.50.

Close season: Nov. 15 to March 25.

Exception: The interior portion of the Province east of the 120th meridian, where the close season is from Nov. 15 to April 30.

Size limit: 8 inches in length; 3 lbs. weight.

Ice fishing is prohibited.

Tidal boundaries are defined in detail in the Regulations.

Trout

Close season: Nov. 15 to Mar. 25.

Exception: The waters of the interior portion of the Province east of the 120th meridian, where the close season is from Nov. 15 to Apr. 30.

Size limit: 8 inches in length and 3 lbs. in weight.

Fishing through the ice for trout is prohibited.

Weekly Close Time

The weekly close time for salmon fishing varies with the different districts into which the Province is divided for this purpose, as follows:—

South of 51st parallel of north latitude: Friday, midnight to 6 p.m. Sunday. Traps west of Gonzales point are exempted. In "off" years—1910, 1911, 1912, 1914, *et al*—this close time shall be six hours longer.

North of 51st parallel of north latitude: 6 a.m., Saturday, to 6 p.m Sunday.

West of Gonzales point: 6 p.m., Friday, to 6 a.m., Sunday.

Provincial Fishery Laws[a]

New Brunswick

The Commissioner of Fisheries may authorize the setting apart of reserves for artificial propagation, and the same shall be protected from trespass by a fine of $100.

The Lieutenant-Governor in Council may grant leases to take fish from these reserves for stocking purposes.

The Surveyor General may issue fishery leases or licenses for fishing in provincial waters under the control of the Province.

Leases authorizing fishing with hook and line shall not be for longer than ten years, and if in the Restigouche river, five years; and such lease shall go to the highest bidder.

Except in cases of leases for fly fishing, the rental shall be fixed by the Surveyor General and paid in advance.

The Commissioner's written consent is necessary for transferring a lease or license.

The Surveyor General, with or without the request of the lessees, may appoint sufficient guardians to protect fishing rights. Every guardian so appointed shall be, for this purpose, an ex-officio provincial constable.

If so required by the Surveyor General, a lessee shall keep at his own expense, a guardian to protect the fisheries rights granted in his lease.

Every person enjoying an exclusive fly fishing lease shall keep one or more such guardians for such period as the Surveyor General may determine.

Lessees must transmit an annual report of their catch.

The Surveyor General may grant leases of waters adjoining Crown Lands that are not under lease, for a period not exceeding three months.

A lessee's conviction of violation of law acts as a cancellation of his lease.

Lessees are answerable for damage done to lands and timber on their leasehold.

Trespassers on property under fishery leases are liable to a fine of $1 to $10, with costs; and persons procuring or assisting in illegal fishing on such leased property shall be liable to a fine of from $5 to $20, with costs. Other penalties range from $5 to $50, with imprisonment in default of payment.

The Lieutenant-Governor in Council may appoint fishery overseers who are ex-officio justices of the peace.

Appropriate penalties are prescribed for violation of the fishery laws and regulations.

a Nova Scotia has no provincial laws respecting fisheries—Letter of Deputy Provincial Secretary of Nova Scotia, Aug. 16, 1910.

Under a penalty not exceeding $25, all non-residents engaging in fly-fishing in provincial waters are required to secure, at a cost of $5, a license from the Surveyor General; but non-residents who are *bona fide* holders of leases are not required to pay for this license.

Any person found committing any offence against the Act, may be arrested by any overseer, guardian or peace officer and tried before an overseer or justice of the peace.

Any person may be a complainant and lay an information under the Act.

Prince Edward Island[a]

An angler's permit is required, under a penalty of $20, of everyone fishing for salmon, trout or bass, who is not a permanent resident of the Province, or a son or a brother of a permanent resident.

Anglers' permits are granted by the Provincial Treasurer, the Game Inspector and the Tax Collectors, the fee being $2.

No person holding an angler's permit may kill in one day more than two salmon, twelve bass or twenty trout.

The export or sale of fish caught under authority of an angler's permit is prohibited under pain of a penalty of $10 and costs.

Hunting and fishing on enclosed property without the owner's consent is forbidden under a penalty of from $5 to $10.

Leases and Licenses

The Lieutenant-Governor in Council may issue grants in fee simple from the Crown to any person, persons or firm, of the beds of any river or lake or of any flats, beaches or foreshores. The Lieutenant-Governor in Council may issue fishery leases or licenses for fishing in provincial waters. These leases or licenses may not be sub-let without the permission of the Lieutenant-Governor in Council, or officer authorized by him to give such permission.

Occupants of lands adjoining lands included in fishing leases shall have the right of free passage over such leased lands.

The lessee, if required by the Lieutenant-Governor in Council, shall make a return of the number and weight of each species of fish caught. In case of failure to do this he is liable to forfeiture of his lease and also to a fine of from $10 to $100.

Licenses permitting fishing for two months in waters covering or adjoining Crown Lands may be issued by the Lieutenant-Governor in Council.

A fishery lease entitles the lessee to bring action in his own name against trespassers.

a Fish and Game Act, 1906, with amendments of 1907, and the P.E.I. Fisheries Act

Penalties

Persons catching, selling, buying, or having in their possession any fish after the expiration of five days from the beginning of a close season are liable to a fine of from $10 to $30 and also to a fine of $1 for each fish caught or held in possession.

Persons other than lessees fishing on leased bottoms or inducing others to do so are liable to a fine of from $25 to $100.

Anyone destroying or injuring any place set apart or leased by the Lieutenant-Governor in Council for the artificial propagation of fish shall be liable to a fine not exceeding $100 and costs, or in default of same, to imprisonment.

Oysters may not be cultivated without a lease from the Crown, of the beds or foreshore on which cultivation shall take place.

The Lieutenant-Governor in Council may appoint fishery overseers to enforce the law.

Oyster Fisheries[a]

The Lieutenant-Governor in Council may cause surveys to be made of the beds or bottoms suitable for growing oysters and may lease the same to individuals desirous of obtaining a lease of the bottom in front of their own foreshore. The application for lease must be in writing and not more than five acres may be leased to one person under such terms and for such length of time as the Lieutenant-Governor in Council may consider proper in accordance with the Act.

The surveyor who makes the survey of the oyster bottoms prior to their being granted shall exclude all such bottoms previously appropriated by law and also all natural or live beds. In case of dispute as to what is a live or natural oyster bed, the matter shall be decided by the Lieutenant-Governor in Council.

Leases may not be granted for more than twenty years. Rental considerations are determined by the Lieutenant-Governor in Council.

On expiration of the lease, renewal may be granted for a period not exceeding ten years.

Any person or persons holding leases of barren bottoms may petition the government for special officers to protect their holdings and the government may appoint officers for that purpose, with the power of police officers, all costs incidental to such appointments being borne by the applicants.

No oyster licenses shall be issued for bottoms where mussel mud is dug nor where productive quahaug beds exist.

Licenses must be obtained by every boat and by every fisherman engaged in fishing for quahaugs—boat license fee, $20; fisherman's license fee, $20.

No quahaug license shall be issued for bottoms where live oyster beds exist.

a Act respecting Oyster Fisheries.

Persons guilty of a violation of the provisions of the Oyster Fisheries Act shall be liable to a penalty not exceeding $50 and costs, or in default of payment, to imprisonment for a period not exceeding one month.

All leases must be registered in the county registry office.

Quebec

Licenses may be issued by the Minister of Colonization, Mines and Fisheries for a period not exceeding nine years. Leases for a longer time, but not exceeding fifteen years, may be issued by Order in Council.

The Minister may lease or license, with the consent of the owner, any fishing rights pertaining to granted lands situate along provincial waters.

Leases in Non-navigable Waters

Crown lands granted since 1884 are subject to a fishing reserve of three chains bordering on provincial non-navigable waters.

The Minister may reduce the depth of this reserve in the case of islands and of lands of small extent.

The non-navigable portion of a partly navigable salmon river may be leased along with the navigable portion or by separate lease.

Leases of lands conferring fishing rights shall be made only in the name of one person or of an incorporated club.

Such leases give the lessee exclusive fishing privileges on the bordering waters.

Leases must make provision for right of passage for occupants of rear lands.

The Lieutenant-Governor in Council shall reserve in each new township one or more lakes or rivers in which residents of such townships may freely fish for domestic purposes only.

Each lessee shall appoint guardians to protect his fishery, and he is also responsible for damage done to timber on his leasehold.

Excessive or wasteful fishing during prohibited seasons shall involve the cancellation of the lease and another shall not be granted for five years.

Infringement of regulations shall also annul lease.

Lessees must make an annual return of the number and weight of fish caught on their territory.

Lessees shall indemnify previous lessees for permanent improvements made.

Licenses in Provincial Waters

A license confers exclusive fishing rights within the limits prescribed but does not preclude third parties from taking bait for cod or for angling for sport.

A fine not exceeding $100 and costs, may be imposed on those violating the privileges conferred on a licensee.

Disputes relative to claims, gear, etc., shall be settled by the local fishery officer subject to appeal to the Minister.

The local fishery officer shall prescribe the distances apart at which fishing gear shall be placed.

Salmon Fisheries

Salmon fishing licenses shall not permit fishing within 500 yards of the mouth of a river where salmon go to spawn. The Minister may define the boundary of estuaries, and no salmon fishing may be allowed in such estuaries save on permit of the Lieutenant-Governor in Council.

Estuary maps shall be prepared by the Minister.

Oyster Beds

Licenses for not longer than 15 years may be granted to persons wishing to plant oyster beds in provincial waters. The maximum fine for trespassing on same is $200 and costs.

Fish Culture Reserves

Reserves for this purpose may be authorized by the Minister and trespassers on such are liable to a fine of $200 and costs. Fishermen may use vacant property accessory to public fishing rights.

Fishways

Fishways, when required by the Minister, shall be built in obstructions placed in any provincial waters under a penalty of $4 a day for default.

Injury or destruction of fishways is prohibited under penalty of fine.

Fines and confiscations are provided for in the case of the violation of the provisions of this Act or the regulations adopted thereunder.

Persons dynamiting fish are liable to a penalty of from one to two years' imprisonment.

It shall be the duty of the Minister to provide a sufficient organization for the protection of the fisheries of the Province.

Every fishery overseer shall have the powers of a justice of the peace.

Open Seasons

Salmon: May 1, to July 31.
Fly-fishing, Feb. 2 to Aug. 14.
Salmon trout: Dec. 1, to Oct. 14.
Ouananiche: Dec. 1, to Sept. 30.
Speckled trout: May 1 to Sept. 30.
Fishing through the ice is prohibited.
Gray trout (muskallunge), touladi (lake trout): Dec. 2, to Oct. 14.
Bass (not including sea bass or barfish): June 16 to March 31.
Eels may be caught in weirs and mill dams, but not so as to deprive other weirs of a share in the run. They may not be taken by spear or torch

during October and November in any waters frequented by salmon or trout.

Doré, May 16 to April 14 (fifteen inches).
Smelts, July 2 to March 31.
Sturgeon, July 1 to May 31.
Whitefish, Dec. 1 to Nov. 9.
Muskallunge, June 15 to April 14.

Ontario[a]

The grant of the bed of any navigable water or of any lake or river shall not include the grant of exclusive fishing privileges unless such is specifically stated.

Special licenses are required for catching sturgeon and for taking spawn for breeding or scientific purposes.

Licenses are required of persons (including Indians and guides) fishing in lake Nipigon, Thunder bay district, Nipigon river, Nipigon district, and in the tributaries of said lake or river.

The Superintendent may authorize the lease of waters for fish culture.

Every net must be marked with the owner's name.

Fishing rights or licenses cannot be sub-let without the Superintendent's written consent.

A lease shall entitle the grantee to all rights of an owner in fee simple, but shall be subject to the right of free passage enjoyed by those holding land in the rear.

Possession, Sale and Transportation

It is illegal to have in one's possession any fish during the close season. No hotel, restaurant or club shall supply fish during the close season unless under special permit; and it shall be considered an additional offense for any such establishment to supply such fish under any pretended name.

Transportation, cold storage, purveying and lumbering companies shall allow fisheries officers free access to their premises and books.

Common carriers and transportation companies or other persons shall not have in their possession for transporting, nor shall they transport, out of the Province any salmon trout, lake trout or whitefish weighing less than two lbs., or any fish caught in the Province at a time or in a manner prohibited by law.

Shipping packages must be so made as to show the contents, shall be marked with a description of the contents and must be labelled with the owner's name.

Licenses

Licenses shall not be issued to any person, or to any corporation employing any person, who has been convicted of any offense against the Act within two years.

a Ontario Statutes, 7 Ed. VII., chap. 49.

Licenses may be cancelled upon violation of the Act or the Regulations, and a conviction shall act as a cancellation.

Licenses may be issued for fishing in lake Nipigon, Nipigon river and adjacent waters on the following conditions:

(1) One license only to one person.
(2) Term of license must not exceed four weeks.
(3) Fees for non-residents of Canada—
$15 for two weeks or less.
$20 for three weeks or less.
$25 for four weeks or less.
(4) Fees for permanent residents of Canada—
$5 for two weeks.
$10 for four weeks.
(5) Licenses are non-transferable.
(6) Sanitary arrangements, disposal of refuse and regulations *re* extinction of fires shall be under the direction of an overseer.
(7) Cutting live timber is prohibited except for camp purposes.

Non-residents of the Province may obtain angling licenses for any waters, except those specially prohibited. These licenses are good for three months on payment of an individual fee of $2, or $5 per rod when those fishing live on their own yachts.

Licenses to guides may be issued at $2 each.

Administration

Administration is under direction of the Superintendent of Game and Fisheries.

Not more than three fisheries inspectors shall be appointed; nor more than ten wardens.

These officials shall have the status of justices of the peace.

Deputy game and fishery wardens shall be appointed without salary except when on special service, and shall receive one-half of all fines resulting from conviction they secure.

Penalties are assigned by the Act for violation of laws and regulations.

Miscellaneous Regulations

Family fishing permits were abolished by Order in Council of Jan. 8, 1909.

Residents of Ontario must obtain a license for fishing by other means than hook and line.[a]

Guides shall be responsible for the extinguishing of fires by parties employing them.[b]

a Order in Council, May 3rd, 1907.
b Order in Council, July 1, 1909.