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CONTENTS

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FEATURES

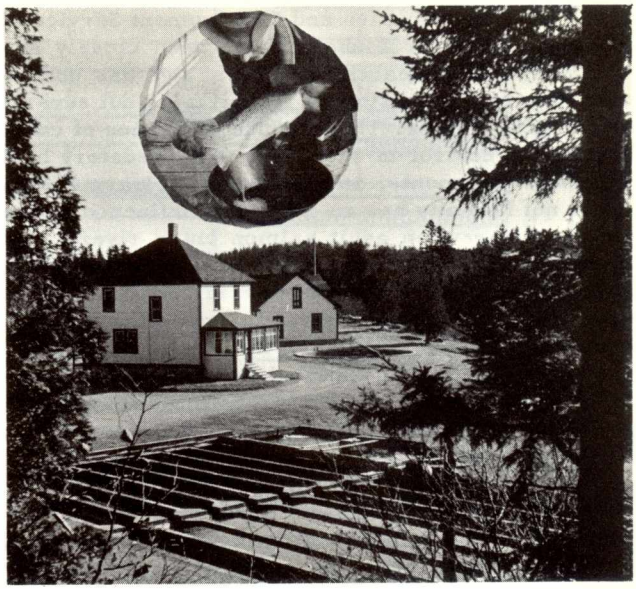
CANADIAN FISHERIES NEWS

FISHERIES NEWS FROM ABROAD

COVER PHOTOGRAPH: As noted on page 17 of this issue, the lobster season is under way along many sections of the Atlantic coastline. This month's cover photograph, taken by Eugene Gorman, Deputy Minister of Fisheries of Prince Edward Island, shows lobstermen putting out from Rustico, P.E.I., to set their traps.

Dr. Kerswill, whose report, beginning on this page, constitutes Part I of the account of the investigation and management of Atlantic Salmon in Canada during 1958, is in charge of salmon investigations for the Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick.

In Part II, the report on the management programme, E.W. Burridge, of the Conservation and Development Service of the Department of Fisheries, Ottawa, has summarized reports submitted by G.S.C. Wilson and V.R. Taylor of the same Service in the Maritimes and Newfoundland respectively, and R.W. Bourassa, of the provincial Department of Fisheries, Quebec, P.Q. The section on the management programme begins on page 11 of this issue.



Ponds at Saint John, N.B., fish hatchery. Inset shows salmon being "stripped".

Part 1--

The Research Programme

By C.J. KERSWILL

SINCE 1950 much more research has been carried out on Atlantic salmon in eastern Canada than ever before. Research staffs have been increased, and facilities for new experiments have been provided in several typical salmon fishing areas. These activities followed the formation, in 1949, of a federal-provincial Co-ordinating Committee whose first task was to review existing knowledge of salmon on both sides of the North Atlantic. The committee decided that management of the commercial and sport fisheries could likely be improved, to increase the annual production of adult fish. It was agreed, however, that many essential facts were still lacking, and that the necessary information could be provided only by research. For example, far too little was known about the factors that control production of young salmon in different kinds of rivers, and about practical methods that might be used to increase production and improve the chances for survival of the young fish until they reach catchable size.

In the 20 years prior to 1950 many valuable studies had been made on salmon in the Atlantic provinces by the Fisheries Research Board of Canada, the Quebec Salmon Commission, the Nova Scotia Department of Trade and Industry, the Newfoundland Department of Natural Resources, and other groups. They provided a background for planning the new programme.

It was decided that the Biological Station, St. Andrews, N.B., of the Fisheries Research Board should continue its studies of production of young salmon in the Pollett River, N.B., which had been in progress since 1942. Activities of the station should be expanded to include work on at least one large, typical salmon river where there were sizable commercial and sport fisheries. By marking young salmon of known river origin as they went to sea and searching for them later over a wide area, it was hoped to learn how they contributed to various fisheries and what part they played in spawning. Various experiments in management techniques would be included as required, such as predatory bird control. The Miramichi River, N.B., was selected for this project and work started there in 1950. The Quebec Department of Fisheries began similar long-term studies on the Port Daniel River of the Gaspe coast in 1953. A similar programme

was started in 1954 on the Little Codroy River, Newfoundland, by the Fisheries Research Board's Biological Station at St. John's, Newfoundland.

The Conservation and Development Service of the Department of Fisheries has been closely associated with research activities and has undertaken major responsibility for carrying out several important projects. They include collection of catch statistics, control of mergansers in predatory bird control experiments, an experiment to learn whether or not heredity has an important influence on the time of year when adult salmon enter rivers, and providing hatchery-reared young fish for stocking experiments. Fishery officers of the Department assist in reporting marked and tagged salmon. The Canadian Wildlife Service of the Department of Northern Affairs and National Resources has participated continuously in the predatory bird control experiments. For several years the Nova Scotia Research Foundation has provided a technician at North Sydney, N.S., to examine Newfoundland commercial catches for marks and tags. Since the start, in 1954, of forest spraying with DDT against spruce budworms in the Miramichi watershed, there has been close co-ordination of studies of the effects of spraying, not only on budworms but on stream fishes and their food, among staffs of the New Brunswick Department of Lands and Mines, the Department of Agriculture, Forest Protection Limited and the Fisheries Research Board. Besides the help given to the research programme by these and other governmental agencies, valuable assistance has been given by salmon associations and by the fishing public in many ways. This includes reporting of catches of marked and tagged salmon, providing information on fishing conditions and offering many worthwhile suggestions.

Every year since 1955 the highlights of recent research findings have been described in an issue of "Trade News", along with a review of the closely related management programme. Reprints of the article have been made available by the Department of Fisheries' Information and Educational Service, for distribution to all who might be interested. Those who would still like to receive copies of the 1955, 1956, and 1957 reviews should address requests to the Biological Station, Fisheries Research Board of Canada, St. Andrews, N.B.

Most research projects on Atlantic salmon must be carried on continuously for many years to give reliable information. This is partly because a long period of six years or more is usually needed for the salmon to complete one life cycle from eggs to adult fish. Another reason is that great differences occur from year to year in the conditions under which the salmon live. Thus, the research programme as a whole does not usually change greatly from year to year, and it is unnecessary to discuss the details of all projects in every annual review. Rather, it has been agreed to review only the latest catch statistics in relation to previous catches, since these are distinct facts having general interest. Besides the statistics, the various research projects will be mentioned only in general terms to indicate what has been taking place. As the occasion demands, more detail will be given on some topics that have reached a particularly interesting stage during the year just passed.

ATLANTIC SALMON STATISTICS

Catch statistics show the availability of adult salmon to commercial fishermen and anglers from year to year. They give some clue to the actual abundance of adult fish in the sea and returning to the rivers. They cannot be depended upon alone for precise information on abundance, owing to the varying effects of weather and water conditions on catches by commercial nets and angling tackle. The statistics help greatly to assess the relative importance of management problems in different areas. When combined, as in the present programme, with other data obtained by operating research sampling gear throughout the open water season in typical areas, the catch statistics become an extremely valuable research tool.

Data on commercial and angling catches in the Maritime Provinces are provided by fishery officers of the Protection Branch of the Conservation and Development Service of the federal Department of Fisheries. The data are grouped under three areas of the "Maritime Region" called the "Gulf", "Fundy", and "Atlantic" Areas. The Gulf Area includes the Quebec commercial landings on the Gaspe coast as far north as Cape Gaspe, and extends around the Gulf of St. Lawrence to the Cape Breton-Richmond County line on the east coast of Cape Breton Island. The Atlantic Area extends from there around the outer coast of Nova Scotia to Cape Sable, N.S. The Fundy Area extends from Cape Sable to Grand Manan Island, N.B. Since 1949 both commercial fishing and angling records have been obtained by a new system for the Maritime Provinces. In the following account commercial landings have been included for the Quebec part of the Gulf Area, while angling statistics for the Gulf Area include only catches in the rivers of the Maritime Provinces.

All the data on commercial catches in Quebec were obtained from published reports of the Quebec Bureau of Statistics. Statistics on commercial and angling catches in Newfoundland were provided by the federal Department of Fisheries.

COMMERCIAL LANDINGS

Figure 1 shows the commercial landings of Atlantic salmon in Quebec, the Maritime Region and Newfoundland in recent years.

In 1958 the total catch in Quebec exceeded the 1957 catch by 49 per cent and was the highest since

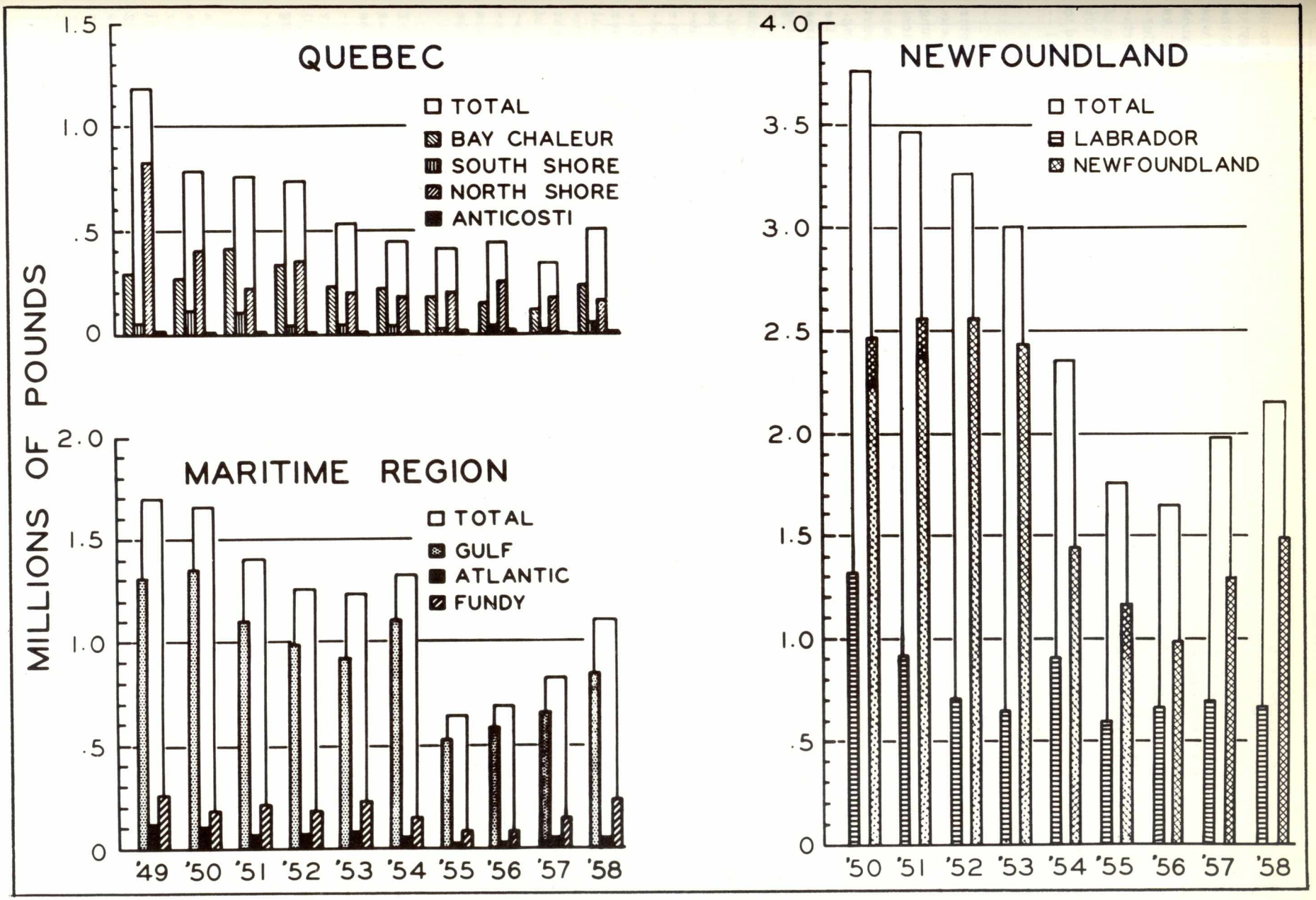


Figure 1. Commercial Landings of Atlantic Salmon in Canada.

1953 when it also just passed 500,000 pounds. The Quebec landings in Chaleur Bay were influenced by the 1958 change in the opening of the season in the Gulf Area from June 5 to May 15. Many large salmon entered the area unusually early in 1958.

In the Maritime Region the 1958 total landings of over 1,100,000 pounds were 33 per cent better than in 1957 and continued a steady upward trend since 1955 when the catch fell below 700,000 pounds, the lowest level recorded there in the past 88 years. The last peak production in the Maritime Region occurred in 1930 when landings exceeded 5,000,000 pounds, while the average total catch of the past 50 years is just over 2,500,000 pounds. The catch in 1958, while very encouraging, is still less than half of what might be considered to be normal.

The commercial salmon fishermen in Newfoundland waters, including the Labrador coast, made a total catch of over 2,150,000 pounds in 1958, which is slightly higher than the 1957 catch.

There was no appreciable change in commercial fishing effort in 1958. Evidently salmon were considerably more plentiful in the vicinity of the nets during the 1958 fishing season than in the previous few years.

ANGLING CATCHES

In Figure 2 are shown the numbers of salmon caught by anglers from 1949 to 1958 in the Maritime Region as a whole, and on its most heavily angled rivers.

The 1958 total angling catch was higher in all three areas of the Maritime Region than in 1957, and the highest recorded since 1949. Throughout the 1958 angling season, water conditions on most rivers were favourable both for the ascent of salmon and for angling. To a considerable extent this may have been responsible for the improved catches rather than a significant increase in the abundance of fish.

Some people were surprised by the good catches of salmon, particularly grilse or small salmon (one sea-year fish) in rivers of New Brunswick which had been affected by DDT sprayings to control the recent spruce budworm outbreak. In 1957, on the basis of our observations on the effects of spraying on young salmon, it was predicted that the stocks of adult salmon would decline, and that as a result the catches in some areas would likely be "below normal" within a few years. The word "normal" was defined as "the total annual catch, whatever it might be, without any effects of DDT on it". Because of variable conditions affecting fishing success, particularly angling, it was guessed that decreases in stock down to 50 per cent of normal as a result of DDT spraying might not be noticed in catches. It was predicted that adult salmon stocks in the Miramichi River as a whole, would fall to 50 per cent of normal by 1960. The earliest spraying in the Miramichi area, however, occurred on the Northwest Miramichi tributary in 1954, and it was believed that adult stocks returning to that branch would be down to 50 per cent of normal in 1958. As expected, our 1958 counting fence records at Curventon, eight miles above head of tide on the Northwest Miramichi, showed the lowest upstream run of large salmon yet recorded (579 as compared to 706 in 1957). The grilse run was 2,419 as compared to only 875 in 1957, and up to the pre-spray level -- much higher than had been expected.

GROWTH RATES AND FOOD

Detailed laboratory studies during the winter of 1958-59 indicated why the 1958 grilse run exceeded expectation. The annual growth of young salmon in recent years in the Northwest Miramichi was calculated from measurements of growth rings on scales of specimens collected in the same part of the area before, during, and after DDT spraying. It was found that during the year of spraying the growth rate of young salmon in affected streams was noticeably reduced. In the year following spraying, however, the growth rate increased above normal, likely because of lack of competition with other fish which were scarce because of spraying. Also, the small insects (for example, midges) on which the young salmon feed, had become re-established in large quantities by that time. This "compensatory growth" of the early stages of young salmon enabled many of the very abundant fry of 1955, the year after spraying, to reach smolt size after only two years of river life instead of the usual three years. The result would be an unexpected increase in the smolt run of 1957 from the Northwest Miramichi area, giving a much greater return of grilse in 1958 than expected. This has been discussed in some detail to show that systematic research work associated with DDT spraying has given useful results in explaining an unusual course of events.

The earlier forecast of serious effects of DDT sprayings on stocks of adult salmon in other areas still stands. This prediction is accompanied by the same reservations as stated earlier, about the possibility of harmful effects of DDT being masked by unforeseen conditions. It is hoped that there will be some natural compensation for the loss of young salmon, as has occurred on the Northwest Miramichi.

It may be of interest to anglers to see a breakdown of catches made on several rivers of the Maritime Region in 1957 and 1958, accompanied by the angling effort in rod-days, as obtained by local fishery officers. These are shown in Table 1, along with columns giving the calculated catch per 10 days of effort in the whole Areas, and on various streams. One "rod-day" represents the fishing activity of one angler during all or part of one day

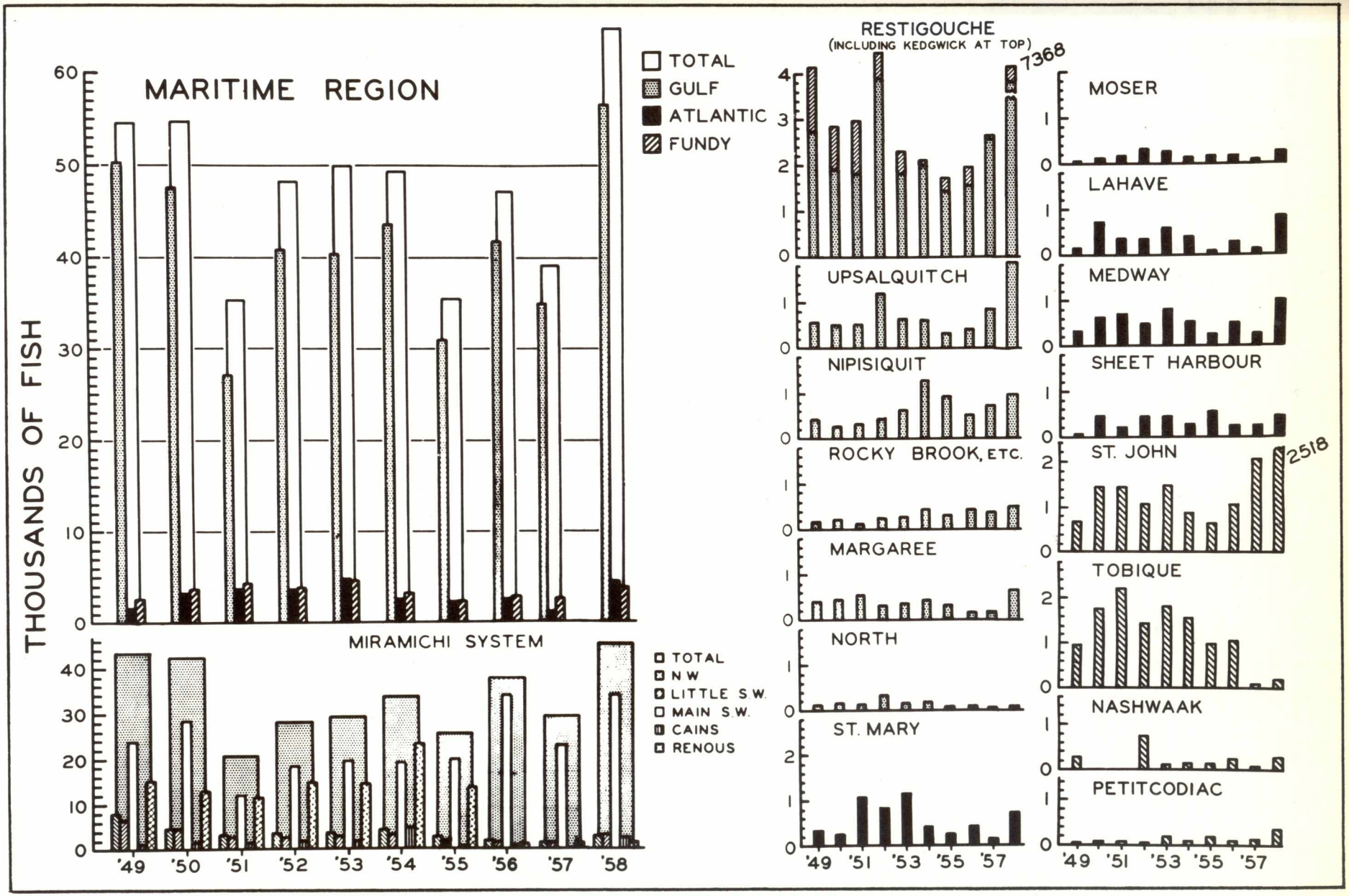


Figure 2. Angling Catches of Atlantic Salmon in the Maritime Region of Canada.

on a particular river. It will be seen that the catch per 10 rod-days of effort was higher on most of the rivers in 1958 than in 1957, even with greater fishing activity everywhere. Large rivers in New Brunswick like the Miramichi averaged seven or eight fish per 10 days of fishing, while heavily fished rivers of moderate size in Nova Scotia like the LaHave and Medway provided about three fish or less per 10 days. The Restigouche gave best returns for angling effort, with 22 fish per 10 rod-days in 1957 and 38 fish per 10 rod-days in 1958.

In the 1957 review, the total angling catch in the Miramichi area was broken down into descending kelts ("black salmon"), and regular incoming salmon, and both were sub-divided into grilse and larger salmon, and by months. Such details of the 1958 catches are omitted here, but they follow the same general pattern.

DISTRIBUTION AND MIGRATIONS

The distribution in freshwater streams of young salmon from the time they are fry until they become large parr and have almost reached the smolt stage, can be determined by electro-seining techniques that have been developed mainly at the Pollett River, N.B., field station. In 1958 routine assessments were made by St. Andrews Station staff at a series of seining stations on the Pollett, Miramichi, and St. John Rivers, N.B., and the Margaree River, N.S. The purpose was to learn the effects on smolt production of experimental plantings of hatchery stock, forest spraying with DDT, hydro-electric development, predatory bird control, and other factors. Similar assessments of young salmon were made by the St. John's Station staff on the Little Codroy River, Nfld., to determine the basic capacity of the river to produce salmon. The Marine Biological Station, Grand River, Quebec, plans a similar programme for 1959 on the Port Daniel River.

As they descend to the sea on a few representative rivers, smolts can be trapped, counted, and be marked by fin-clipping or tagged, for identification after they have reached the adult stage as grilse or older salmon. In 1958 a record high of 30,000 smolts were counted and marked at the Pollett River trap. These resulted from a combination of (1) a natural spawning experiment that has been in progress for several years, (2) a supplemental planting of young hatchery stock in 1956 that was calculated to give maximum total smolt production at the rate of five smolts per 100 square yards of stream bottom, and (3) experimental plantings of young salmon of smolt size. In the Miramichi area 18,000 smolts were marked at Curventon on the Northwest Miramichi, and 8,100 at a new trap on the Cains. Neither of these traps were operated to capture all the smolts produced in the rivers, but to give a supply of fin-clipped fish of known origin for estimating total smolt production of the Mira-

Table 1. Comparison of angling catches of salmon in 1957 and 1958, Maritime Region.

	1957			1958			
	No. Fish (C)	Effort Rod-days (E)	$C/E \times 10$	No. Fish (C)	Effort Rod-days (E)	$C/E \times 10$	Increase in 1958 catches over 1957
Maritime Region Total	39,106	104,831	3.8	65,048	157,848	4.1	66%
Gulf Area Total	35,207	51,926	6.8	56,764	74,383	7.6	61%
Miramichi System	29,972	40,965	7.3	45,067	58,135	7.8	50
Restigouche System	3,437	1,552	22.0	9,268	2,412	38.0	170
Nipisiquit	725	3,130	2.3	1,048	3,540	3.0	45
Margaree	185	1,215	1.5	334	1,275	2.6	81
Atlantic Area Total	1,237	43,905	0.3	4,500	66,468	0.7	265%
St. Mary	143	1,440	1.0	735	4,392	1.7	415
Moser	81	4,690	0.2	207	6,475	0.3	156
LaHave	118	952	1.2	807	2,265	3.6	580
Medway	295	4,992	0.6	1,038	7,668	1.4	252
Sheet Harbour	283	10,585	0.3	368	14,945	0.2	30
Fundy Area Total	2,662	9,000	3.0	3,784	16,997	2.2	42%
St. John (main)	2,010	3,222	6.2	2,518	6,401	3.9	25
Tobique	65	260	2.5	186	539	3.5	186
Nashwaak	66	877	0.8	218	3,021	0.7	230
Petitcodiac	123	976	1.3	337	1,250	2.7	174

Counting fence for descending smolts and ascending adult salmon, first installed in May, 1957, near Camp Adams on the upper Northwest Miramichi River, 40 miles above head of tide and about 20 miles below source.

michi system, and to learn how and where the fish are utilized later. On the Little Codroy River, 9,341 smolts and on the Port Daniel River, 544 smolts were trapped for the same purpose.

In the Miramichi estuary numbered Swedish type tags were applied to 1,000 smolts in June, 1958. It is hoped that these or other tags will be suitable for the identification of fish from the smolt to adult stages, to give more information than fin-clipping. It is planned to tag 10,000 Miramichi smolts there in 1959. Similar smolt tagging experiments are being done by the Grand River, Quebec, staff.

With facilities now available it is impossible to learn the whereabouts of salmon between the smolt stage when they descend to sea, and the adult stage when they can be caught by commercial gear, angling, and research traps. In 1958 the usual data on catches of marked and unmarked adults were obtained as follows: (1) by technicians at North Sydney, N.S., and Saint John, N.B., for Newfoundland commercial landings; (2) by technicians at Escuminac, N.B., for the local drift-net fishery, and in Miramichi trap-netting and angling areas; (3) by technicians on the Gaspe coast for the Quebec commercial fishery; (4) by fishery officers for commercial and angling catches in the Maritime Provinces, and for angling catches in Newfoundland. Analysis of data on the 650 recaptures of marked salmon reported in 1958, including scale readings, is nearing completion.

Sampling traps and counting fences are operated annually for adult salmon at several points as part of the research programmes on the various rivers. These give a useful record of the occurrence of salmon before, during, and after the public fishing seasons, and help in evaluating present fishery regulations. Of particular interest in 1958 was a close relationship found on the Little Codroy River, Nfld., between the numbers of returning adult salmon of native origin, and previous annual smolt production. It illustrates the valuable contribution that can be made to the whole Atlantic salmon programme by long-term systematic investigation on one small river.

PRODUCTION OF YOUNG

Since 1941 an experimental stretch of the Pollett River, N.B., has been used for smolt production studies, because it has been inaccessible to spawning adults unless it was desired to introduce them. Experimental introductions of hatchery-reared underyearlings under various conditions were completed in 1957. Now an experiment is in progress to show the amount of natural spawning required for best smolt production. Data already obtained suggest that 250 eggs deposited per 100 square yards of stream bed by adult salmon are equivalent to 35 planted hatchery underyearlings in producing five smolts from an average 100 square yard unit of area.

Technician (W.G. Irving) recording data on salmon landed by commercial drift netters at Escuminac, N.B., and taking scale samples for age determination.

Some available freshwater rearing areas are decreasing in size and suitability because of hydro-electric developments and other activities. Experimental releases of large hatchery-reared young salmon that might migrate promptly without needing rearing area in the stream, were made in 1957 and 1958 in the upper stretches of the Pollett and Miramichi Rivers. Checking their down stream migrations at counting traps below, showed that fish that had reached a length of at least 5 1/2 inches in May of the year of planting, migrated to sea at once, if planted during the time of regular smolt descent. Some of the planted fish were marked, and their contribution to local or other fisheries should be known soon.

Many other studies involving the production of young salmon are in progress or being planned for the rivers which are under investigation. In this category are the investigations of the effects on salmon production of experimental removal of mergansers. This has already been shown to have beneficial effects on smolt production, but proof of the effects on catches of adult salmon must still be obtained in a suitable experimental area.

ENVIRONMENTAL CHANGES

In 1958 there was continued effort to assess the effects on salmon of environmental changes that are associated with industry.

Annually since 1954 forest spraying with DDT insecticide to control an outbreak of spruce budworms has been investigated in the Miramichi area. In 1958, previous findings reviewed in earlier reports were confirmed, and some new information was obtained as discussed above under "angling catches". Additional experiments were undertaken in 1958 near Richibucto, N.B., in co-operation with the Department of Agriculture, in the hope of finding other insecticides that would have less harmful effects on young salmon and their food than the regular application of DDT-in-oil at a rate of 1/2 lb. DDT per acre. There were indications that 1/4 lb. DDT per acre had little short-term effect on either young salmon or aquatic insects, yet gave worthwhile control of budworms. The recent budworm epidemic has come to an end in New Brunswick and no further sprayings are scheduled as part of the forestry programme. It is planned, for the purpose of finding a better insecticide from the fisheries standpoint, to continue small-scale experimental spraying in 1959 in one small area where budworms are still plentiful.

In co-operation with biologists and engineers of the Department of Fisheries, some attention was given in 1958 by St. Andrews Station staff to the new salmon problems in the St. John River, N.B., associated with power dams at Tobique Narrows and Beechwood. Our activities included assessment of young salmon populations above Tobique Narrows, study of smolt descent at Beechwood and of methods to safely by-pass smolts, and setting up a systematic creel census in the Tobique flowage to assess effects of the dam on abundance of other species, particularly predatory fish.

Preliminary plans were made in 1958 to learn the long-term effects of lumbering operations on salmon and trout production, using the upper waters of the Miramichi as an experimental area.

BEHAVIOUR STUDIES

Behaviour studies are now recognized to have basic importance in long-term salmon research, and a comprehensive outline of desirable research projects has been prepared by staff of the St. Andrews Station. These come under the headings: distribution of salmon, tolerance limits, movements and migrations, social behaviour, feeding, escape behaviour, and spawning. To date the work has consisted mostly of observations and experiments in the field, but it is planned to begin laboratory research in 1959 using space and equipment in the new wing of the St. Andrews Station. In 1958 progress was made in developing the use of skin-diving equipment for studying the distribution and behaviour of both young and adult salmon in shallow upriver areas of the Miramichi River. This would permit confirmation of laboratory studies under natural conditions.

Technician collecting emerged insects in cage-trap on branch of Bass River, near Richibucto, N.B., 1958, to determine effects of forest spraying with insecticides on production of food organisms used by young salmon.

Pulpwood dumped into river during October, 1958, to be held by snubber boom until drive in spring, 1959, with cleared areas along shore in background, Upper Northwest Miramichi River, N.B.

Part 2 - -

The Management Programme

By E.W.BURRIDGE

THE MANAGEMENT of Atlantic Salmon under the Atlantic Salmon Programme, as originally outlined, was made the responsibility of applied branches of the agencies administering fisheries in the eastern provinces. In the Maritimes and Newfoundland this became the duty of the Fish Culture Development Branch of the Department of Fisheries' Conservation and Development Service. In Quebec, the Protection and Management Service of the provincial Department of Fisheries undertook this phase of the programme.

The problems confronting these groups at the programme's inception were many and varied. A considerable amount of the preliminary work has been completed; however, new and more complex problems have been encountered as industrial expansion in the area continues.

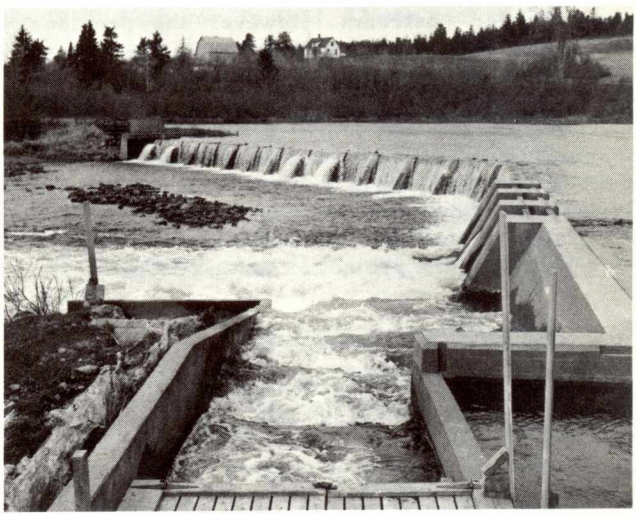
The problems in management of the Atlantic Salmon are dealt with by a comparatively small group of engineers, biologists and technicians. It is their responsibility to develop and effect studies of problems associated with environmental changes in salmon waters resulting from a wide range of man's activities. Studies have been designed to test new fish culture practices to establish their usefulness as management tools.

The following review describes in some detail 1958 activities of the management phase of the Atlantic Salmon Programme. The section of the review describing projects undertaken by the Quebec provincial Department of Fisheries is quite brief since a considerable amount of their work deals with investigations of trout and other freshwater game fish.

MARITIMES AREA

Early-Late Run Experiment

This experiment, initiated in 1955, was designed to determine if "early-run" salmon produce "early-run" progeny and conversely if "late-run" salmon produce "late-run" progeny. A known "late-run" river, River Philip in Nova Scotia was chosen to conduct the early phase of the experiment and a river known to contain predominantly "early-run" fish, the LaHave on Nova Scotia's south shore was picked to conduct the late phase of the experiment. In 1955 and each year thereafter carefully supervised smolt releases have been made in these rivers. Marked "early-run" progeny were released in River Philip and marked "late-run" progeny in the LaHave River.



Salmon trapping facilities at River Philip, N.S.

In 1958, for the second consecutive year all salmon ascending River Philip were trapped and examined for marks. It was again found that a significant number of the early arriving salmon were "marked" fish. An examination of the 1958 data shows that 56 per cent of the salmon arriving before August 15 bore the "River Philip mark". Since the regeneration of mutilated fins occurs quite frequently it is considered possible that others in this group may have also originated from the "early-run" planting. Since the results of this phase of the experiment may be considered successful in that they indicate that "early-run" parents appear to produce "early-run" progeny it has been decided to continue a modified version of this work in 1959.

The smolts to be released will be tagged instead of marked thereby eliminating the complicat-

ing factor introduced by the regeneration of removed fins.

The LaHave River salmon run was examined throughout the entire angling season in an attempt to locate marked fish. Salmon taken by anglers and those ascending the fishway at Wentzell's Dam, the lower river check point, were all examined for missing fins. Of the 816 salmon taken by anglers between April 15 and August 31 three marks and one possible mark were reported. During the period April 15 to September 30, no marked fish were found among the 193 salmon examined at Wentzell's fishway.

Checking salmon migrants at Wentzell's Dam fishway became impossible after September 30 when the residents of the area destroyed a section of the dam which they felt would cause the river to flood their land. By releasing the water from the dam and lowering the pond-level the Department's fishway (the lower river salmon check point) was made completely inoperative. Later in the season, when the "LaHave marked" fish were expected, five marked fish were recorded at fishway counting traps further upstream. However the previously described incident rendered the experiment valueless due to the incompleteness of data.

During the two years that data from this experiment have been gathered on the LaHave River a number of factors have confused the results. The destruction of the dam precluded the continuation of the project in 1958 and consideration is being given to transferring the project to another river.

Experimental Predator Bird Control

Experimental programmes to control the American merganser on two selected salmon streams were initiated in 1954 to provide additional data on the relationship of reduced merganser populations to salmon survival and return. On two selected rivers, the St. Mary's in Nova Scotia and the Miramichi in New Brunswick, organized hunts have been undertaken annually by Departmental officers and seasonal predator hunters.

Between 1954 and 1957 on the St. Mary's River a progressive decline in the number of birds destroyed has been recorded by the two-member hunting party (Table I). However the 1958 total of 223 birds was the third largest number destroyed since the programme's inception. The officer responsible for directing the programme attributes the increased kill to the presence of more broods, the large numbers of salmon parr, an extended period of good water conditions, modified patrol methods, and the use of two additional hunters on a part time basis.

The reduction in the number of birds killed in the 1958 Miramichi River programme followed the pattern established in the first four years of operations. Although the number of hunters participating was reduced to eight men, from the former strength of ten and twelve, the officer responsible for the operation considered the effectiveness of the 1958 hunting force equal to that of previous years. Because of the continued reduction in the number of birds taken each year the programme will be modified in 1959.

TABLE I

Birds destroyed on the Miramichi and St. Mary's Rivers 1954 to 1958.

	1954	1955	1956	1957	1958
Miramichi River	1028	436	178	106	55
St. Mary's River	424	240	113	87	223

A second year of pre-predatory bird control studies on the Margaree River, N.S., undertaken by the Canadian Wildlife Service, the Fisheries Research Board and the Department of Fisheries, was completed in 1958. The work involved merganser banding and census and salmon parr census in preparation for a merganser control programme.

Fisheries Problems Associated with the Development of the Saint John River System

With the completion of the Beechwood project in 1957, the second large power development on the Saint John River system, an accelerated programme to study salmon problems became necessary. Preliminary studies commenced in 1957 were continued during the 1958 migration period. Additional problems, which only became apparent during the first year of operation of the Beechwood plant, were also dealt with during 1958.

Downstream Salmon Migrant Studies

A programme to determine the period of migration and progress of the downstream migrant run in the Tobique River system continued from May 10 through June 20. It was intended that results from this project would provide information on the possibility of a delay to downstream salmon migrants in the flowage area above the Tobique Narrows power development.

Gill nets and trap nets were set at selected points on the Tobique River and a smolt fence and trap were erected on the Odell River to sample the smolt run. It was concluded from these operations that smolts do not move in any concentrated numbers at this time of the year. Negative results were also obtained from the periodic sampling undertaken during the late summer and fall of the year. It is proposed to modify and repeat this programme during 1959. Also associated with this work was the study of predator fish populations in the flowage area above the Tobique Dam. The only large speci-

mens of predacious species captured were speckled trout and eels. Stomach analysis of these indicated the former to be feeding mainly on insect larvae and the latter on common shiners. A continuation of this project is being considered.

During the fall and winter, studies were initiated to determine the degree of utilization of the Saint John River below Beechwood Dam by spawning salmon and by resident and migrant juvenile salmon. Very little quantitative data was collected due to continued adverse weather and water conditions at the time of the spawning survey. However young salmon were captured at 21 stations between Beechwood Dam and the head of tide during the lower river population studies. This information indicated extensive utilization of this section of the river by juvenile salmon as a nursery area. A continuation of the project is proposed for 1959 with electrical fishing gear.

Upstream Salmon Migrant Studies

Counting stations were again established by the Department of Fisheries at Beechwood and Tobique Dams. A total of 4,565 salmon and grilse were counted through the Beechwood Dam fish facilities between June 2 and November 22 and 2,662 of these fish were passed through the Tobique fishway during approximately the same period.

The passage of fish at the Beechwood skip-hoist fish facilities was hampered by abnormally high river levels during July and August. Although passage conditions in June appeared satisfactory few fish were present below the dam to take advantage of the facilities. The number of fish passed over the dam rose sharply in mid-July but dropped off in August when the fish facilities became inoperative due to the extremely high river levels. A large number of the migrants delayed by the adverse conditions at this time entered during early September. (Figure I).

The 1958 Tobique run was later in arriving than in the pre-Beechwood years with the first fish passing through the facilities on June 10. The run built up gradually, peaking in early August after which there was a fairly sharp reduction in the daily counts reflecting the unsuitable water conditions at Beechwood. This decline was followed by a sharp upswing to a peak in early September (Figure II). A comparison of the three years appearing in Figure II illustrates how the 1958 escapement approached the magnitude of the pre-Beechwood runs of which 1956 was the last.

Of the 4,665 fish counted through the Beechwood facilities a total of 819 were tagged. The tagging, a continuation of the programme initiated in 1957 was designed to provide information on the migration time from Beechwood to the Tobique fish facilities. The percentage of the tagged portion of the run travelling the distance between the dams in five days or less was approximately the same in both years, i.e. 34 per cent in 1957 and 37 per cent in 1958. However, in 1957, 83 per cent of the tagged fish covered this distance in 11 days or less and in 1958 only 51 per cent covered the distance in the same period. It is felt that the prolonged delay experienced by the main body of the run below Beechwood Dam during the period of high water, was to some extent responsible for the increased number of tagged salmon taking more than eleven days to travel this stretch of river. The altered conditions in the headpond area of course must also be considered.

An analysis of the data from the two-year study indicates that the percentage of the run proceeding above Tobique Dam varied from 56 per cent in 1957 to 64 per cent in 1958. The tagged portions

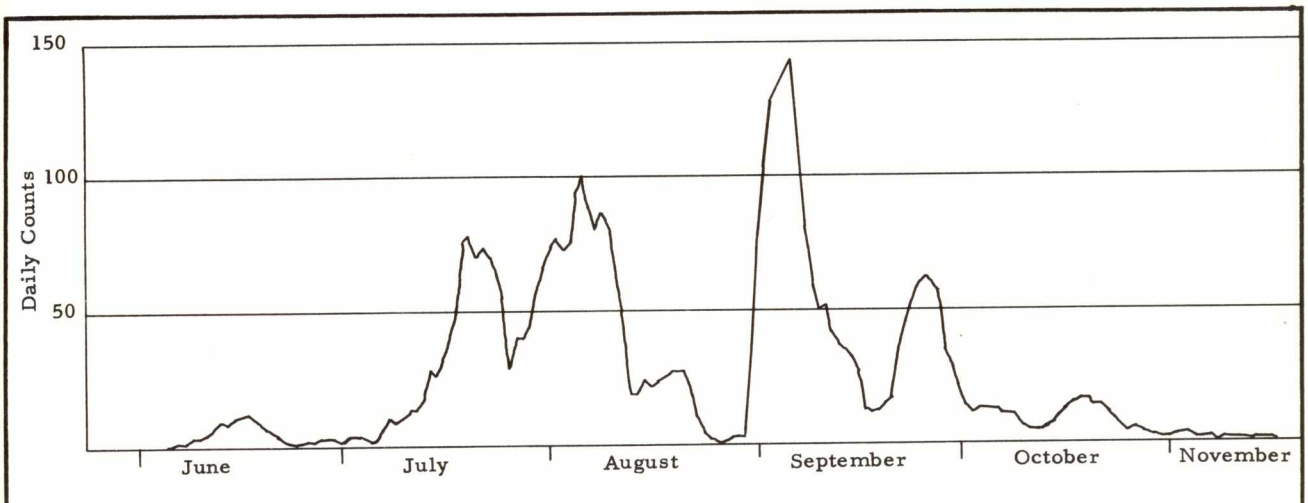


Figure 1. Beechwood Daily Counts (1958) smoothed by sevens.

of these runs were not included in the calculations since it was considered that variations in the behaviour of tagged fish might introduce an additional source of error. Also in the calculations an allowance was made for a five per cent fall back and return at Beechwood since fish released from the skip-hoist enter the headpond near the spill gates and the records show that a number of tagged salmon drop back from this point.

Altered conditions in the area below Beechwood Dam have resulted in the development of a sport fishery which has shown exceptionally good returns to the angler. In this section of the river, downstream from the half-mile closed area below Beechwood Dam a total of 1,272 salmon* were taken by anglers in 1958. Further restrictions on angling in this area are being introduced in 1959 to provide additional protection.

The comparatively light runs to the Tobique River in the past two years have worked hardships on the sport fishing industry. From an examination of Table II it can be seen that during the pre-Beechwood years, 1953 to 1956, the total runs counted through the Tobique facilities varied from 3,723 to 4,985. Also during these years the angling catch varied from 984 to 1,802 fish or from 26 per cent to 38 per cent of the run passing through the fishway. During 1958, 186 salmon or seven percent of the total run went to the anglers leaving 2,476 fish to proceed to the spawning grounds. It is illustrated clearly in Table II that the spawning escapement for 1958, 2,476 fish, compares favourably with the spawning escapement for the pre-Beechwood years which ranged from 2,671 and 3,464. This factor could be extremely important in assisting to rebuild the Tobique runs of the future.

TABLE II

Tobique River Salmon Run Data 1953 to 1958

	Total Run	Catch Total	Catch % of Run	Total Escapement to Spawning Grounds
1953	4656	1802	36	2854
1954	4985	1521	30	3464
1955	3775	984	26	2791
1956	3723	1052	28	2671
1957	569	25	4	544
1958	2662	186	7	2476

Fishway Assessment

a) Beechwood Dam.

Efficiency studies of the fish facilities at Beechwood Dam on the Saint John River were carried out in 1958. Work will continue in 1959 to determine the most efficient operation of the fish entrance facilities in the power house collection gallery. Various modifications have been suggested to the New Brunswick Power Commission. These

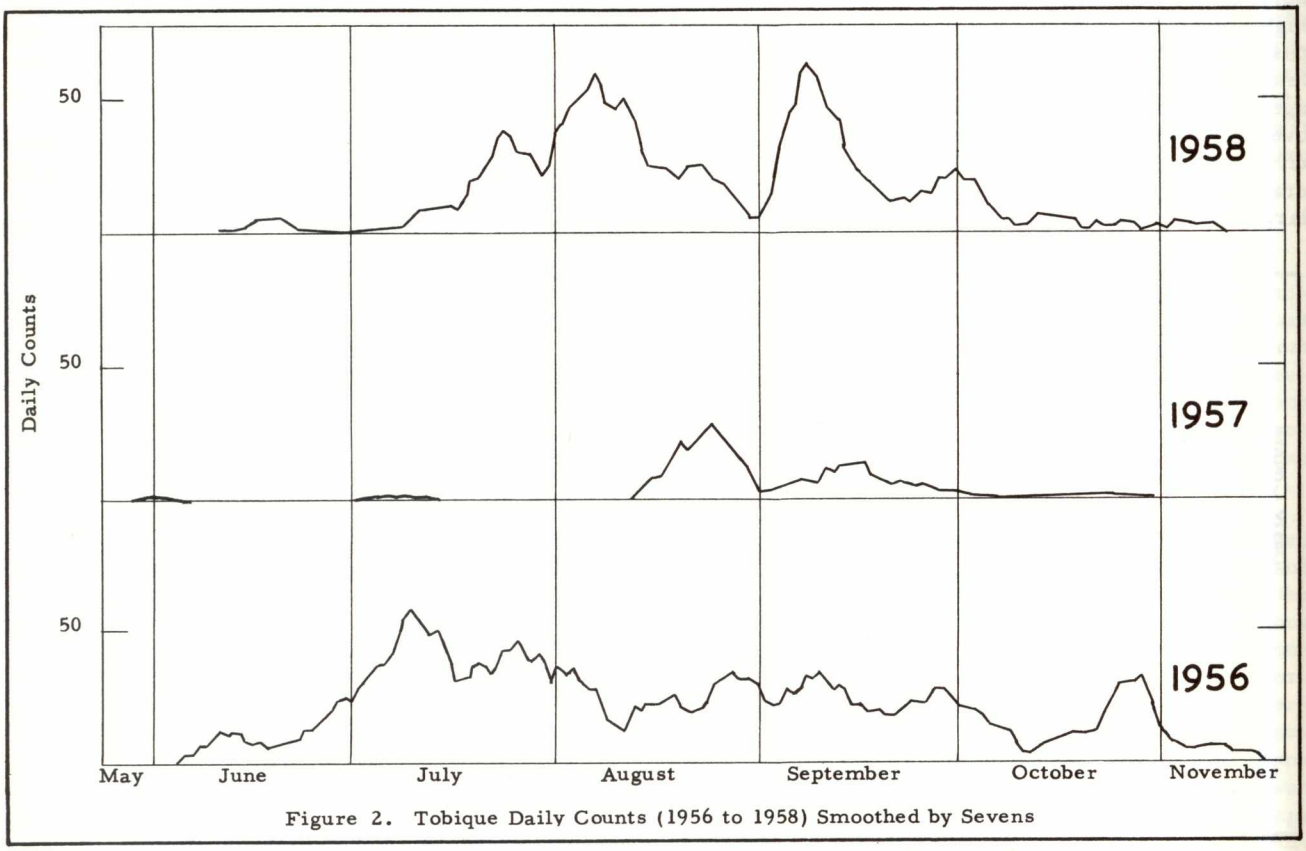
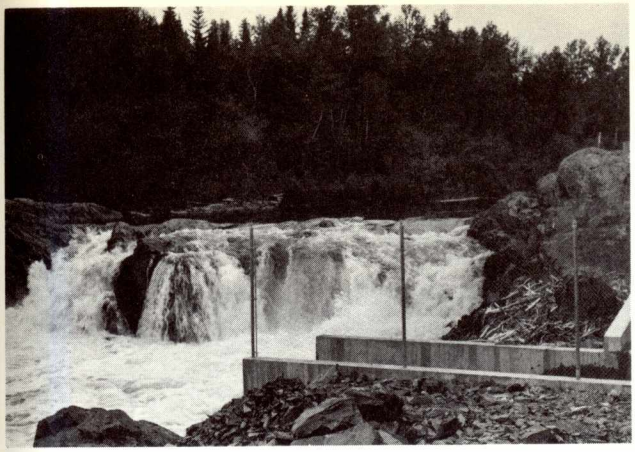
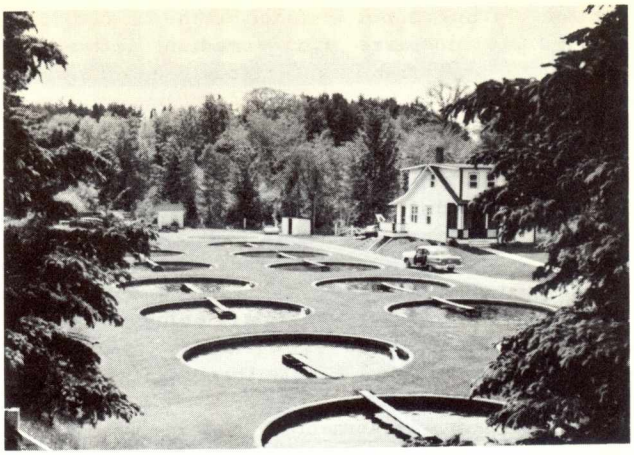


Figure 2. Tobique Daily Counts (1956 to 1958) Smoothed by Sevens

* Includes large and small salmon (grilse)



Falls and fishway entrance, Indian River, Nfld.



Rearing station at Coldbrook, N.S.

modifications will increase the operating range and efficiency of the present fish facilities.

b) LaHave River.

Studies were continued at Indian Falls, Parnell and Zwicker Dam Fishways on the LaHave River system. For the second consecutive year some salmon ascended the Parnell fishway to enter previously inaccessible reaches of this river. Observations will be discontinued at Indian Falls fishway since past records have indicated this installation to be effective in assisting salmon above the falls at previously impassable water levels.

Fisheries Problems Associated with Aboideau Construction

Several technical meetings have been held with the Maritime Marshland Rehabilitation Administration to discuss the design and location of fish passage facilities in the Annapolis River aboideau under construction at Annapolis Royal. Data are now being gathered on the timing and magnitude of the fish runs in this area in connection with efficiency studies of the proposed fish facilities.

Pollution Studies

Three river sections known to have been subjected to polluting effluents from food processing plants and other sources were re-examined by Departmental biologists. In two of these areas lethal conditions were found to exist and remedial action has been recommended. In the third area a recheck made by the Department of National Health and Welfare and the Department of Fisheries, indicated that the river discharge was adequate to handle the existing pollution load. A fourth river section known to receive effluent from a canning plant was found to be polluted and remedial measures have been recommended.

In addition to the major projects reviewed above the normal programme of fishway and hatchery maintenance and construction, and stream obstruction surveys, was completed by the Maritime engineering staff.

Hatchery Distributions

During 1958 the Department's hatcheries distributed a total of 13,500,000 speckled trout (one per cent over yearlings) 8,000,000 Atlantic salmon (eight per cent over yearlings) 1,800,000 brown trout, over 100,000 Sebago salmon, 274,000 lake trout, 50,000 rainbow trout and 5,000 arctic char.

The production of post yearlings salmon was again increased over the previous year. In 1958 over 690,000 fish in this age group were released and of these 154,000 were marked in conjunction with various experiments and stocking programmes. These programmes included the early and late run experiments on the LaHave and on River Philip, Fisheries Research Board studies on the Miramichi and Pollett Rivers and a stocking programme to assist in rebuilding the Saint John-Tobique runs.

NEWFOUNDLAND AREA

Salmon Transfer

The transfer of the adult Atlantic Salmon run from Rattling Brook on Norris Arm to Great Rattling Brook was continued. This was the second year of an operation to salvage a salmon run which, as a result of a hydro-electric installation, faced eventual elimination (see Management Programme - 1957. Trade News, June 1958). In the 1958 transfer 808 adult salmon were moved to Great Rattling Brook with a loss of 2.7 per cent.

The transfer programme to Great Rattling Brook is an integral part of a plan to make large, previously inaccessible areas of Great Rattling Brook available to salmon. Fishway construction and other stream improvement work on Great Rattling Brook are being undertaken in conjunction with

the above programme. It is expected that construction work, which was commenced in 1958, will be completed in 1959.

Observations of tagged and untagged fish, above the point of release in Great Rattling Brook indicate a successful escapement to the miles of potential spawning area. It is expected that progeny of these transferred adults will form the nucleus of future runs to the upper reaches of Great Rattling Brook. At the present time various methods of downstream migrant sampling are being explored in preparation for a future programme to determine the degree of success of these transfers.

Salmon Stream Assessment

Middle Brook, a relatively small salmon stream in the Bonavista Bay area, now under consideration as a future power system, will be investigated during 1959 by a biological survey team. Preliminary data gathered from 1956 to 1958 indicated that the adult salmon run to this stream is in the order of 750 fish; however it is felt that more detailed information on the timing and distribution is necessary before a proper assessment of the problem can be made.

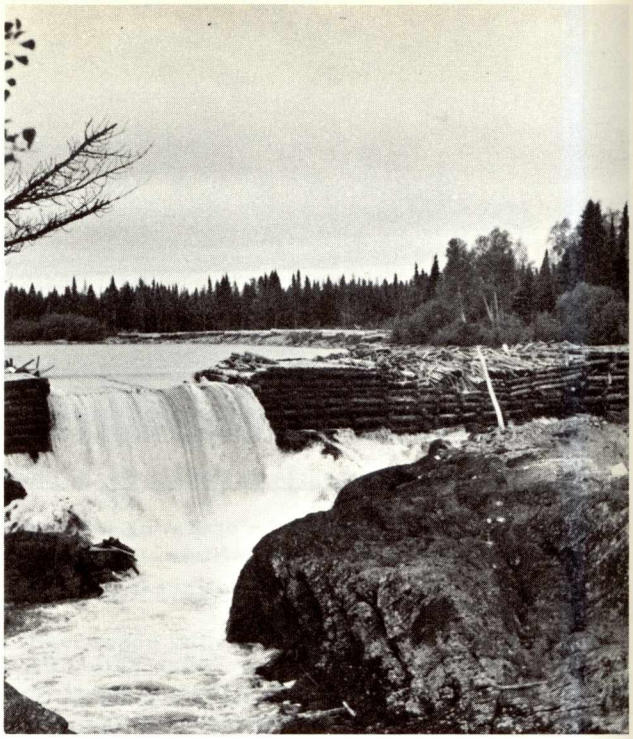
A programme initiated in 1955 to assess recently constructed fishways and also to obtain accurate information on the size of salmon runs was continued in 1958. Data from the six check points under observation indicated that larger than average runs, for recent years, entered fresh water during 1958 (Table III).

TABLE III

Fishway Counting Trap and Angling Data 1955 - 1958

	1955	1956	1957	1958
Middle Brook				
Fishway count	*	462	30	563
Angling below fishway		102	145	174
Salmon Brook (Gander River)				
Fishway count	*	*	965	1573
Angling below fishway			241	393
Indian River				
Fishway count	*	*	*	923
Angling below fishway	221	305	183	427
Terra Nova River				
Lower Fishway count	*	594	182	872
Upper Fishway count	77	76	22	10
Total Angling	194	216	76	135
West River				
Fishway count	*	1338	*	*
Angling below fishway	232	469	235	386

* Fishway or counting trap not in operation.



Site of new fishway on Great Rattling Brook, Nfld.

QUEBEC

Salmon Stream Improvement

In the Matane River, prior to 1957 only a few salmon were landed annually. However in the past two years approximately 3,000 salmon have been caught by anglers. This substantial increase in the salmon run is attributed to the stream improvement programme initiated a few years ago. The programme involved the construction of two new fishways which made previously inaccessible areas available to salmon.

As a result of the success on the Matane River other projects are being planned. Two streams in the same area, the Toben and Ouelle Rivers, were surveyed in 1958.

Of the two systems the Ouelle has been selected for improvement first. Plans are being prepared to remove an unused dam, and to stock the system with hatchery reared salmon.

River Grand Cascapedia, one of the finest salmon streams in the province, was the only one in 1958 where fishing did not improve. As a result, a special survey of the river was made in late August. The study indicated that the paper company's log pond at the river mouth was at times completely blocking the channel. The arrangement of booms and piers will be altered during the coming spring to overcome this problem.

Canadian Fisheries News

Lobster Operations

Lobster fishing is now in full swing in Newfoundland and along most of the shoreline of the Maritime Provinces. The fishery opened in all sections of Newfoundland and in some parts of the Maritimes on April 20, and in some other Maritime districts on May 1. Ice conditions in certain sections of Newfoundland made it impossible for fishermen to start full scale operations immediately after the opening of the season.

In the Maritimes, a special flying squad of Protection Officers of the Department of Fisheries has been trained to combat illegal lobster fishing. Designated as a Special Protection Force, this small group has already swung into action in the Maritimes to assist local Fishery Officers where trouble has arisen.

The formation of the force is the Department's answer to the challenge created by the outbreak of violence on the lobstering fronts in New Brunswick and Prince Edward Island last year. At that time the eruption of outlawry by poachers, which saw Fishery Officers and patrol boats attacked by fishermen using firearms and other weapons, drew stern warnings from Fisheries Minister J. Angus MacLean, who said such depredations would not be tolerated, and that the licenses of fishermen who flagrantly violated lobster regulations would be revoked.

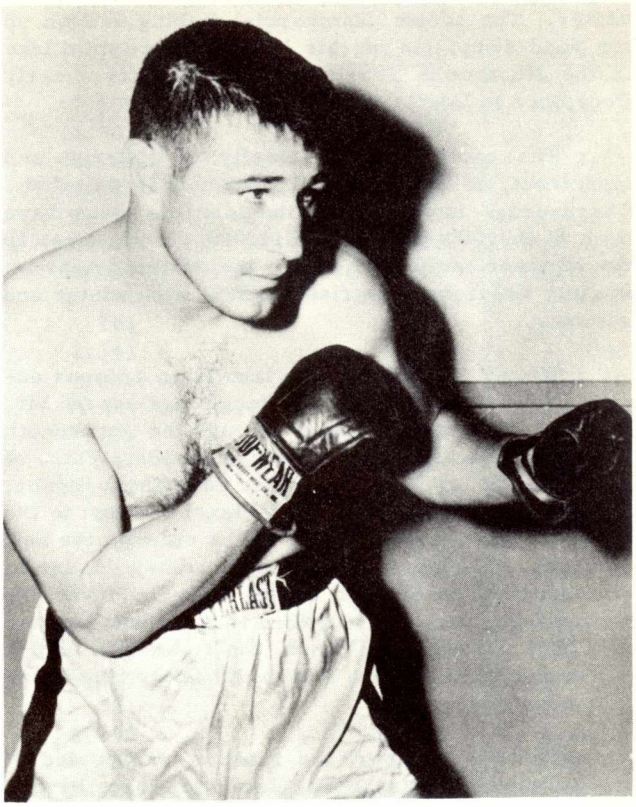
In New Brunswick and Prince Edward Island, which have 7,106 lobster fishermen, there were 292 prosecutions for illegal lobster fishing last year. In Nova Scotia, which has 12,000 lobster fishermen, there were 242 such cases. There were 53 prosecutions in Newfoundland.

Durelle on Lobsters

Canada's light-heavyweight boxing champion, Yvon Durelle, of Baie Ste. Anne on Miramichi Bay, New Brunswick, who is also a well-known commercial fisherman, recently appealed to lobster fishermen of the Maritimes to protect their fishery.

Durelle, who is training in Moncton for a bout with world champion Archie Moore in Montreal next July, says that he is essentially a fisherman. "That's my life; that's my work. I guess you could say that boxing is more or less a sideline."

In an interview in Halifax, he said: "We must remember that things are not as they used to be. In other days there were fewer fishermen and more fish. Today it is different; there are now more fishermen and less fish.



Yvon Durelle, British Empire Lightheavyweight Champion, leading contender for the world's title, who is also a New Brunswick fisherman and lobster conservationist.

"There was a time when a lobsterman could go out to his traps and probably take home a hundred pounds of short lobsters for himself and his friends. A lot of fishermen doing that meant a lot of lobsters. If we are going to protect our own future and the future of our children, we must not do that. Taking short lobsters doesn't pay -- it hurts the industry and it hurts the fishermen. When you take only legal-size lobsters you sleep better and your dreams are better."

Durelle has four fishing boats, including a new 48-foot longliner. While he is training the boats are fished by hired crews. Although lobsters are an important part of the Durelle fishing operation, he, personally, directs his main attention to salmon drift netting. With his new longliner, he plans to venture into deeper water for groundfish. Not only will he fish longline fashion -- a method involving the use of baited hooks suspended from a longline held by two buoys -- but he also plans to do some dragging with trawls.

Fishing on Great Slave

The hardy commercial fishermen of Great Slave Lake landed a catch of 1,744,248 pounds last winter. The winter commercial fishing season on the wind-swept ice of this 11,700 square mile lake in the Northwest Territories extends from early December to late March.

The catch consists chiefly of whitefish and lake trout, of which about 75 per cent is whitefish. The average landings over the past four years have been 6,462,000 pounds; 4,311,000 pounds taken in the summer and 2,151,000 in the winter. Approximately 300 fishermen fish the lake both winter and summer.

Winter fishing on this lake is an arduous ordeal as the fishermen must struggle against the bitter cold to drop nets down through the ice beneath huts which have been mounted on skids. This, of course is the age-old procedure for winter fishing; however, there is a somewhat bizarre aspect to the operation as the mingling of the old with the new emerges. The advances made in transportation in this century are utilized by the fishermen who use snowmobiles to carry supplies to their huts. After they have landed their catch, the fishermen load it on the snowmobiles for shipment back to Hay River on the south shore.

From Hay River, the catch is transported by trucks down the Mackenzie River to Peace River, where it is taken by train to Chicago. It is then sent to eastern U.S. centres.

Statistics Filmed for Research

Electronics, one of the miracle servants in the modern world, is being utilized in the form of an automatic micro-filming machine by the Economics Service of the Department of Fisheries in Vancouver, B.C. Every two years, over 500,000 statistical copies of fisheries sales slips are micro-filmed. The slips are then destroyed and the film forwarded to the Fisheries Research Board, Biological Station, Nanaimo, B.C., for future use in research projects. The sales slips, which were instituted on a coastwide basis in 1951, provide such information to the scientists as the exact catch by species and gear in each area during the year.

The micro-film machine can automatically feed about 400 sales slips at one loading and can film over 100 per minute. The slips are photographed side by side on the film and it is estimated it will take 20 film rolls or approximately 4,000 feet of film to complete the project. Each day's micro-filming is processed and checked the same day to assure satisfactory results.

Assistant Area Director

The appointment of Dr. James Cameron Stevenson as Assistant Area Director for the Pacific Area, Department of Fisheries of Canada, has been announced by the Civil Service Commission. The Department's Pacific Area headquarters are in Vancouver. Dr. Stevenson's appointment is effective June 1. He is now employed by the Fisheries Research Board of Canada as Assistant Director at the Board's biological station in Nanaimo, B.C.

Dr. Stevenson received his B. A. from the University of Saskatchewan in 1939, and his M.A. from that university in 1942. He majored in biology. He joined the Fisheries Research Board as a scientific assistant in 1943 and completed his Ph. D. studies at the University of Toronto in 1955. He was appointed assistant director of the Fisheries Research Board Station at Nanaimo in 1956.

Canadian Salmon in S. Africa

South African workers display Canadian fresh frozen salmon being transferred from storage to shops in Johannesburg.

Fishery Officers Meet

Senior officers headed by the Area Director, Pacific, A. J. Whitmore, were kept busy in February and March attending annual meetings of the District Offices located at Prince Rupert, New Westminster and Nanaimo, B.C.

The meetings lasted three days at each point, and were attended by all Fishery Officers attached to each district. Each Fishery Officer spoke about the work in his sub-district and the problems related thereto.

Fishery Figures For March

SEAFISH: LANDED WEIGHT AND LANDED VALUE

	May 1957 - Mar. 1958		May 1958 - Mar. 1959	
	'000 lbs	$'000	'000 lbs	$'000
CANADA - TOTAL	1,660,645	74,754	1,842,735	96,279
ATLANTIC COAST - Total	1,304,578	47,505	1,116,498	45,738
Cod	635,207	14,903	489,450	12,148
Haddock	105,522	3,761	84,716	3,680
Pollock, Hake & Cusk	65,364	1,211	75,975	1,356
Rosefish	47,573	1,052	58,815	1,417
Halibut	6,895	1,610	5,133	1,386
Plaice & Other Flatfish	82,208	2,554	79,355	2,507
Herring & Sardines	224,267	2,478	202,964	2,685
Mackerel	18,727	741	15,442	803
Swordfish	5,179	1,341	5,377	1,439
Salmon	2,936	1,026	3,443	1,208
Smelts	3,260	441	3,846	555
Alewives	11,121	153	8,746	123
Other Fish	34,113	447	30,916	530
Lobsters	42,771	13,923	39,874	14,143
Clams & Quahaugs	6,181	297	4,606	221
Scallops	3,007	1,146	3,035	1,183
Other Shellfish	10,247	421	4,805	354
PACIFIC COAST - Total	356,067	27,249	726,237	50,541
Pacific Cods	12,714	898	10,872	708
Halibut	22,054	3,611	22,264	4,603
Soles & Other Flatfish	7,136	411	6,632	351
Herring	166,568	2,758	496,118	8,206
Salmon	131,256	18,582	174,930	35,624
Other Fish	4,510	121	3,765	114
Shellfish	11,829	868	11,656	935
BY PROVINCES				
British Columbia	356,067	27,249	726,237	50,541
Nova Scotia	420,232	21,335	413,435	21,426
New Brunswick	178,727	6,730	156,751	7,178
Prince Edward Island	39,513	3,401	37,487	3,543
Quebec	126,620	3,414	98,785	3,414
Newfoundland	539,486	12,625	410,040	10,177

MID-MONTH WHOLESALE PRICES, Mar., 1959

		Montreal	Toronto
		$	$
Cod fillets, Atl. fresh, unwrapped	lb.	.339	.377
Cod fillets, Atl. frozen, cello 5's	lb.	.288	.317
Cod fillets, smoked	lb.	.363	.392
Haddock fillets, fresh, unwrapped	lb.	.456	.497
Herring kippered, Atl.	lb.	.254	.292
Mackerel, frozen, round	lb.	.250	.285
Lobsters, canned, Fancy	case 48-½s	42.85	42.87
Sardines, canned	case 100-¼s	9.04	8.93
Halibut, frozen, dressed	lb.	.380	.388
Silverbright, frozen, dressed	lb.	.425	.382
Coho, frozen, dressed	lb.	.615	.588
Sockeye, canned, grade A	case 48-½s	22.17	21.94
Pink, canned, grade A	case 48-½s	12.77	12.88
Whitefish, fresh	lb.	.366	.317
Lake Trout, frozen	lb.	.418	.432

PRICES PER CWT. PAID TO FISHERMEN
(Week ending Mar. 14th)

	1958	1959
	$	$
Halifax		
Cod Steak	3.75	4.25
Market Cod	3.25	4.00
Haddock	6.00	6.00
Plaice	3.25	3.50
Yarmouth		
Haddock	6.00	8.00
Black's Harbour		
Sardines	2.00	2.00
St. John's, Nfld.		
Cod	2.00	2.25
Haddock	3.00	2.25rd
Rosefish	2.00	2.00
Vancouver		
Ling Cod	8.00-12.50	10.50-14.00
Gray Cod	4.00- 6.00	4.00- 6.00
Soles	4.00- 8.00	8.00
Salmon(rdspg.)	23.00-28.00	25.00-50.00

Fishery Figures For March

STOCKS AS AT END OF MARCH

	1958 '000 lbs	1959 '000 lbs
TOTAL - Frozen Fish, Canada	29,972	37,037
Frozen-Fresh, Sea Fish - Total	14,823	20,709
Cod, Atlantic, fillets & blocks	1,259	1,868
Haddock, fillets & blocks	2,686	3,697
Rosefish, fillets & blocks	517	912
Flatfish (excl. Halibut), fillets & blocks	956	1,030
Halibut, Pacific, dressed & steaks	1,454	2,235
Other Groundfish, dressed & steaks	1,639	1,289
Other Groundfish, fillets & blocks	1,649	859
Salmon Pacific, dressed & steaks	2,023	5,483
Herring Atlantic & Pacific	757	280
All Other Sea Fish, all forms	840	2,301
Shellfish	1,043	755
Frozen-Fresh, Inland Fish - Total	2,796	4,330
Perch, round or dressed	7	55
Pickerel (Yellow), fillets	122	25
Sauger, round or dressed	(1)	107
Tullibee, round or dressed	270	291
Whitefish, round or dressed	832	977
Whitefish, fillets	319	611
Other, all forms	1,246	2,264
Frozen-Smoked Fish - Total	1,420	1,121
Cod Atlantic	520	369
Sea Herring, kippers	402	420
Other, all forms	498	332
Frozen for Bait and Animal Feed	10,933	10,877
Salted and Pickled Fish, Atl. Coast		
Wet-salted - Total	15,455	8,902
Cod	13,302	5,355
Other	2,153	3,547
Dried - Total	24,715	7,858
Cod	23,037	6,808
Other	1,678	1,050
Boneless - Total	91	256
Cod	81	192
Other	10	64
Pickled - Total (barrels)	13,438	5,868
Herring "	10,896	1,001
Mackerel "	614	1,908
Alewives "	1,918	2,953
Turbot "	10	6
Bloaters (18 lb. boxes)	118,632	79,452
Boneless Herring (10 lb. boxes)	4,818	2,013

(1) Less than three firms reporting.

CANADIAN EXPORT VALUE OF FISHERY PRODUCTS, MAY-FEBRUARY

(Value in Thousands of Dollars)

	1958		1959	
Total Exports	116,262		139,005	
By Markets:				
United States	84,388		88,127	
Caribbean Area	15,529		13,539	
Europe	12,434		34,289	
Other Countries	3,911		3,050	
By Forms:				
Fresh and Frozen	71,481		75,885	
Whole or Dressed	26,229		30,831	
Salmon, Pacific	5,325		8,810	
Halibut, Pacific	3,052		3,922	
Cod, Haddock, Pollock, etc.	683		747	
Swordfish	1,826		1,842	
Other Seafish	3,847		3,688	
Whitefish	4,777		4,718	
Pickerel	2,596		2,467	
Other freshwater fish, n.o.p.	4,123		4,637	
Fillets	29,453		29,663	
Cod, Atlantic	11,072		11,125	
Haddock	3,857		3,032	
Rosefish, Hake, Pollock, etc.	2,207		3,223	
Flatfish	4,788		4,836	
Pickerel	3,111		2,198	
Other	4,418		5,249	
Shellfish	15,799		15,391	
Lobster (Alive & Meat)	14,174		13,774	
Other	1,625		1,617	
Cured	22,177		18,729	
Smoked	1,352		1,327	
Herring	783		939	
Other	569		388	
Salted, Wet & Dried	17,545		14,790	
Cod	15,037		12,751	
Other	2,508		2,039	
Pickled	3,280		2,612	
Herring	1,823		1,448	
Mackerel	851		440	
Other	606		724	
Canned	15,052		36,254	
Salmon, Pacific	10,630		31,831	
Sardines	2,073		2,214	
Lobster	1,991		1,801	
Other	358		408	
Miscellaneous	7,552		8,137	
Meal	3,910		3,698	
Oil	750		1,446	
Other	2,892		2,993	

Fisheries News From Abroad

United States Fishing Industry Investments

Fishermen, processors and distributors have a capital investment of more than a billion dollars in the fish business in the United States, according to Fishery Leaflet 393 just released by the Department of the Interior, Washington, D.C.

The same report indicates that the estimated retail value of fishery products marketed during 1958 was more than $1.7 billion.

The domestic catch was 4.72 billion pounds, a decrease of 62 million pounds, but the value of the catch to the fishermen was a record $370 million, an increase of $19 million over 1957.

Imports were up the equivalent of 290 million pounds (live weight basis) over 1957, which makes a net gain for 1958 of 228 million pounds. This made 7.4 billion pounds (live weight) available for the American market.

The per capita consumption in 1958 was 10.4 pounds, or .3 pounds higher than in 1957.

Fishery Leaflet 393 is the preliminary annual summary of the fisheries of the United States. It is issued by the Bureau of Commercial Fisheries, Fish and Wildlife Service. It contains information on employment, catch, manufactured fishery products, foreign fishery trade, historical production trends, and other information of value to the fishing industry and to those interested in fishery economics.

The $370 million value of the catch as landed increased to $633 million at the processor level for the domestic items which were manufactured. At the wholesale level the value of the total United States catch is estimated at $882 million and to the retailer $1.2 billion.

The value of the imported fishery products which were received fresh, frozen, and otherwise processed was $320 million. Imported items processed in the United States were worth $155 million after manufacturing. The value of all imports reached $502 million at the wholesale level and $552 million when they reached the retailer. Domestically caught fish and imports were valued at $788 million to the processor, $1,384 million to the wholesaler and $1,702 million to the retailer.

The domestic producers of fish have invested $411,500,000 in boats and $89,000,000 in fishing gear. The fisheries provide employment for 142,000 fishermen and transporters and 97,000 persons in wholesale and manufacturing establishments.

The Atlantic coast produced 53 per cent of the domestic catch or 2,502 million pounds. Other producing areas show: Pacific coast, 904 million pounds; Gulf coast, 780 million pounds; Alaska, 380 million pounds; Great Lakes and Mississippi River, 150 million pounds.

San Pedro again led all ports in poundage and value of fish landed, with 380 million pounds, principally tuna, Pacific sardines and mackerel, valued at $27,900,000.

Inter-American Food Congress

Food technologists from the United States and U.S. Department of Agriculture officials will present a bilingual programme, through the medium of simultaneous translation, for Latin American Government officials, food industry representatives and their guests from 17 countries at the Annual Inter-American Food Congress to be held at Miami Beach, Fla., June 9-13, 1959. The Congress is sponsored by the Inter-American Food Institute, a nonprofit corporation designed to assist the Latin American food industry.

The purpose of the Institute is to promote, through a scientific, nonpolitical effort, effective co-operation and exchange of ideas and information among the people of the Caribbean Area, relative to technical and scientific advances pertaining to the production, processing, packaging, quality control, and marketing of food and food products.

Latin Americans from every type of food industry will be in Miami Beach to learn the latest advances in bio-chemistry, chemistry, microbiology, enzymology, and the nutritional aspects of meat, poultry, fish, fruit, vegetables, cereal, confections, and dairy products, as well as processing and packaging methods, quality control, grading, and marketing. Special sections will be devoted to each of these subjects.

The Institute is at present governed by an executive committee consisting of six men from United States industry and six from Central and South America.

Major manufacturers in the food field will exhibit their products at the Congress for the inspection of the Latin Americans who will attend.

Norway

EXPORTS OF PRINCIPAL FISHERY PRODUCTS

January - December, 1958

For Comparative Table see "Trade News", June 1958

Quantities in Thousands of Pounds — Value in Thousands of Kroner

DESTINATION	TOTAL EXPORTS		MAINLY COD					HERRING			CANNED FISH	FISH MEAL	OILS	
	Quan.	Value	Fresh	Frozen	Dry Salted	Wet Salted	Stockfish	Fresh	Frozen	Salted			Medicinal	Other
	th.lb.	th.kr.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.
Canada	4,444	10,002	-	710	-	-	-	-	-	487	3,223	-	24	-
U.S.A.	44,914	79,127	-	10,406	873	1,345	963	-	-	8,016	21,109	256	1,415	531
Other Western Hemisphere														
Brazil	28,316	43,632	-	-	27,445	-	-	-	-	-	-	-	397	474
Columbia	68	72	-	-	-	-	-	-	-	-	-	-	68	-
Cuba	8,208	13,844	-	-	8,208	-	-	-	-	-	-	-	-	-
Mexico	4,027	4,031	-	-	1,190	-	-	-	-	-	-	2,039	152	646
Dutch W. Indies	454	696	-	-	454	-	-	-	-	-	-	-	-	-
Peru	163	344	-	-	108	-	-	-	-	-	-	-	55	-
Venezuela	1,742	3,129	-	-	1,742	-	-	-	-	-	-	-	-	-
Europe														
Austria	12,566	7,584	-	2,251	-	-	-	-	-	1,775	-	8,170	130	240
Belgium	26,811	16,800	1,881	-	-	-	439	417	1,336	-	1,100	21,116	88	434
Bulgaria	1,274	393	-	-	-	-	-	-	1,274	-	-	-	-	-
Czechoslovakia	40,545	22,448	-	7,335	-	-	-	4,429	11,843	5,218	417	-	1,587	9,716
Denmark	10,551	6,457	556	-	-	-	-	-	-	1,157	273	8,510	-	55
Finland	6,158	5,424	-	-	-	-	849	-	-	161	269	4,601	278	-
France	57,690	31,679	8,935	584	-	2,952	-	1,493	3,000	3,772	1,340	34,974	159	481
Germany (East)	69,129	25,649	5,040	7,224	-	-	-	20,095	15,783	10,549	4,131	6,219	88	-
Germany (West)	81,637	40,521	196	8,316	-	1,310	218	27,185	7,231	2,998	1,270	30,803	408	1,702
Greece	5,513	4,830	-	683	-	4,632	-	-	-	-	-	-	198	-
Italy	61,251	77,560	4,065	4,683	4,028	22,066	17,176	-	-	-	-	7,366	236	1,631
Eire	445	635	-	-	-	-	-	-	-	-	445	-	-	-
Netherlands	31,997	20,919	820	1,947	-	-	406	1,669	721	-	364	24,976	739	355
Poland	6,017	2,178	-	-	-	-	-	-	4,460	441	-	-	-	1,116
Portugal	16,813	15,006	-	1,958	11,669	-	-	-	3,186	-	-	-	-	-
Roumania	2,205	660	-	-	-	-	-	-	2,205	-	-	-	-	-
Spain	13,465	18,108	-	-	11,693	-	-	-	-	-	-	-	132	1,640
Sweden	48,290	47,073	5,748	7,756	-	1,281	1,962	897	-	12,147	820	17,271	-	408
Switzerland	26,155	13,025	-	4,246	-	-	-	-	-	-	-	21,777	132	-
United Kingdom	110,939	112,298	34,795	4,067	-	-	-	10,082	6,012	-	15,229	40,551	-	203
Yugoslavia	1,237	2,610	-	-	-	-	1,131	-	-	-	-	-	106	-
U.S.S.R.	96,180	34,630	-	-	-	-	-	-	10,897	85,283	-	-	-	-
Other Countries														
Australia	4,377	8,497	-	-	-	-	-	-	-	-	4,377	-	-	-
Belgian Congo	163	284	-	-	163	-	-	-	-	-	-	-	-	-
Fr. Equat. Africa	6,754	12,390	-	-	-	-	6,146	-	-	-	608	-	-	-
Indonesia	75	75	-	-	-	-	-	-	-	-	-	-	75	-
India	2	6	-	-	-	-	-	-	-	-	-	-	2	-
Israel	8,325	6,687	-	3,424	-	-	-	-	1,984	-	-	2,727	130	60
Liberia	611	1,074	-	-	-	-	611	-	-	-	-	-	-	-
New Zealand	935	1,815	-	-	-	-	-	-	-	-	935	-	-	-
Nigeria & Brit. Cameroons	51,702	100,060	-	-	-	-	51,702	-	-	-	-	-	-	-
Nigeria	3,188	1,932	-	-	-	-	-	-	2,780	-	408	-	-	-
Portuguese Africa	3,702	5,978	-	-	3,702	-	-	-	-	-	-	-	-	-
Spanish Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Union of S. Africa	3,274	6,669	-	-	-	-	-	-	-	-	3,274	-	-	-
Turkey	245	240	-	-	-	-	-	-	-	-	-	-	245	-
Ghana	767	359	-	-	-	-	-	-	767	-	-	-	-	-
Others	22,946	195,870	192	7,107	2,507	1,036	1,188	46	2,542	851	1,801	2,253	1,276	2,147
TOTAL Jan.-Dec./58	926,270	827,700	62,228	72,697	73,782	34,622	82,791	66,313	76,021	132,855	61,393	233,609	8,120	21,839
TOTAL Jan.-Dec./57	1,068,504	894,681	58,854	55,544	93,036	21,922	79,468	125,989	100,737	138,657	70,423	297,009	9,750	17,115

Current Reading

"Species Composition of Industrial Trawl Landings in New England, 1957," by Robert L. Edwards, (Special Scientific Report, Fisheries No. 266, U.S. Fish and Wildlife Service, Department of the Interior, Washington 25, D.C.).

The industrial trawl fishery has been growing rapidly in New England since its start in 1949. Landings of so-called "trash fish" have excited the interest of members of the fishing industry since that time. The introduction to this report says that since the beginning there have been many complaints from sportsmen and fishermen to the effect that large quantities of valuable food species, particularly the yellowtail flounder, were being utilized for animal food. Others claimed that excessive quantities of small fish of various other species were likewise being wasted. In order to clarify the situation and help settle the considerable amount of discussion about the industry, research on the fishery was started in 1955. This report is concerned solely with presenting an estimation of the landings of the various species involved at the principal New England ports in 1957. The landings totaled about 168 million pounds.

"United States Tuna Fishery, 1911-1958," by E. A. Power, (Fishery Leaflet 484, United States Fish and Wildlife Service, United States Department of the Interior, Washington 25, D.C.).

The tunas are one of the United States' leading fishery resources. In 1958, as in the two preceding years, tunas were taken by U.S. fishermen in greater volume than any other foodfish, and they ranked third in the value of the catch. Five species are taken generally. These are the albacore, bluefin, little, skipjack and yellowfin. In addition, bonito and yellowtail are packed tuna-style and are known as "tunalike fishes." However, they cannot be labelled "tuna".

The taking of impressive quantities of tuna on the Pacific Coast, where most of the United States catch is made, is of comparatively recent origin. Tuna were well known to Southern California anglers prior to the twentieth century. However, the fish were not considered edible and the catches were usually discarded.

Failure of the Pacific sardine to appear in the San Pedro area in 1903 was primarily responsible for the development of the tuna fishery. In an effort to keep his cannery operating, a packer canned 700 cases of tuna which were distributed to wholesalers. Repeat orders were received and, by 1907, a small tuna canning industry began to move out of the experimental stage. By 1914, eleven canneries were operating and the industry was becoming well established. In 1958, a total of 36 canneries in seven States, American Samoa, Hawaii and Puerto Rico produced a pack of 277 million pounds of canned tuna and two million pounds of bonito and yellowtail. In the same year, 46 million pounds of canned tuna and 12 million pounds of bonito and yellowtail were imported into the United States.

As the demand for tuna increased, local supplies off southern California were found to be inadequate and it became necessary for vessels to make voyages south of the Mexican boundary, off Central and South America, where large concentrations of skipjack and yellowfin were available throughout the year.

In 1927, for the first time, the catch south of the boundary exceeded production off California. Catches off Central and South America continued to grow rapidly and, in most years since 1947, over 90 per cent of the Pacific Coast catch has been taken from waters south of the Mexican border.

A small tuna fishery has been carried on in the North Atlantic for many years. Bluefin is the principal species taken. However, the North Atlantic catch of these fish in any year has not exceeded three million pounds. A small fishery for yellowfin has been conducted in the Gulf of Mexico since 1951.

"Current Bibliography for Aquatic Sciences and Fisheries," prepared by the Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Rome, Italy.

As from the January 1959 issue, the monthly periodical "Current Bibliography for Fisheries Science," published by the Biology Branch of the Fisheries Division of FAO, will be titled "Current Bibliography for Aquatic Sciences and Fisheries." This does not reflect a change in the contents, references for inclusion in the bibliography being selected by the same criteria as before. The revised title simply defines the contents better.

The announcement of the change in title states: "Whilst, since it works to encourage fisheries research generally, FAO has an interest in limnology and marine sciences, nevertheless the international aspects of these sciences are more the concern of other agencies. Fisheries scientists are, however, deeply interested in developments in these related fields, and the libraries of fisheries research institutions usually try to maintain good collections of the relevant documents."

E. R. Clark
Deputy Minister.

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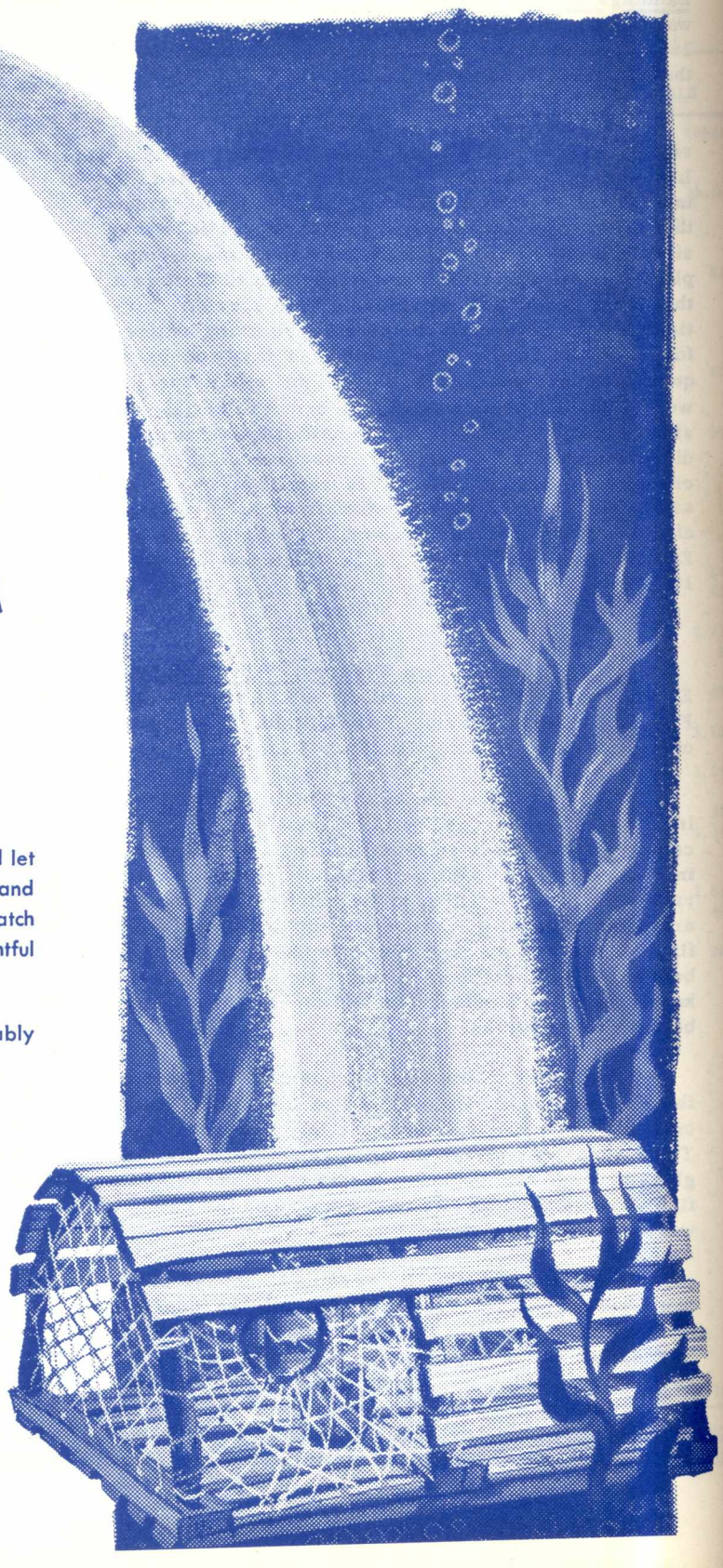

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The Queen's Printer and Controller of Stationery, Ottawa, 1959