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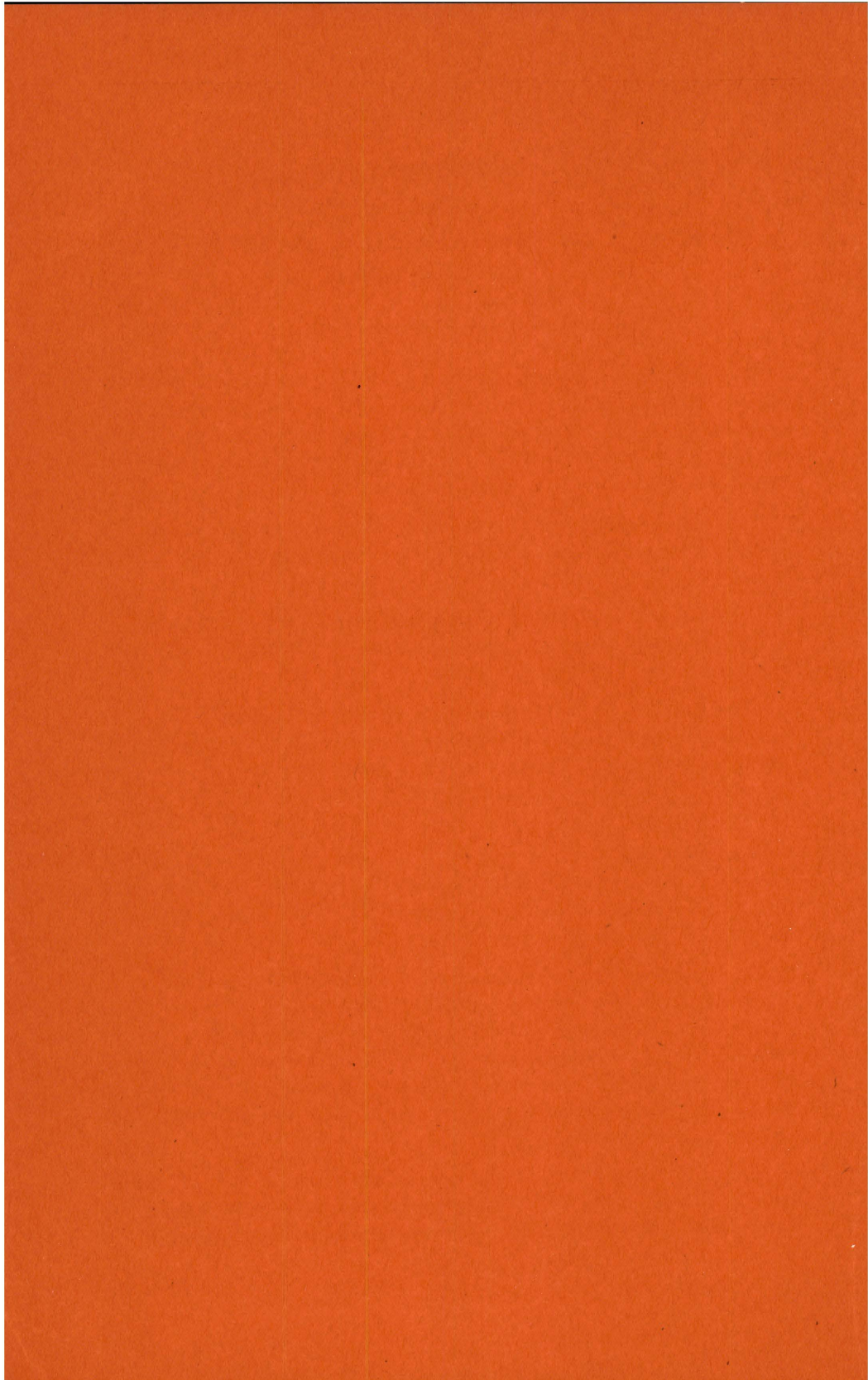
(In three volumes)

VOLUME I.

3

Report
of the
Commission to Study
the
Atlantic Salmon

January 1, 1947



FOREWORD

TO REPORT OF THE COMMISSION TO STUDY THE ATLANTIC SALMON

When the first settlers came to this country they found that in the spring virtually all of the rivers from New Jersey northward were alive with countless thousands of salmon that were making their way from the mysterious depths of the sea to their spawning grounds in the upper reaches of these various rivers.

For a great many years they and their descendants enjoyed this harvest that a kind and thoughtful Providence had brought to their doors.

But these forbears of ours were unmindful of their blessings. With a thoughtlessness that seems shocking to us, they completely destroyed these fabulous spring runs of fish.

They did it by building dams that were insurmountable thus preventing the fish from reaching the spawning grounds and so procreating their kind. They did it by making the rivers the dumping grounds for all kinds of waste through which the fastidious salmon would not swim.

Gradually the Atlantic salmon, the most beautiful and one of the most desirable of all fish, disappeared from the American scene. Today it is extinct in the United States except for a few small runs in some of our eastern Maine rivers.

This disappearance of the salmon is a shocking condemnation of man's stewardship over the bountiful riches of nature with which the Almighty has endowed us. It belongs in the same category as the despoilation of our forests; as the man-created erosion that has ruined forever hundreds of thousands of acres of our land; as the extinction or near extinction of many of the birds, animals and fishes that once populated our country.

We of Maine are the sole arbiters of the Atlantic salmon's future in this country. We will restore our salmon runs to something approaching their former glory or we will allow the last salmon to die

and thus bring to an end ignominiously the history of this magnificent fish in our nation.

If we decide upon the latter course we will be holding ourselves up to the contempt of all men from this time forward. We will be looked upon as being stupid, ignorant and totally irresponsible; as being persons God has trusted unwisely.

This report will point out the material advantages that will accrue to Maine if our salmon runs are increased. The evidence presented is incontrovertible. But even though not a single dollar was to be returned for the money spent to preserve the salmon for posterity we would have to do it or admit that in our dealings with God's creatures we are morally derelict. Our duty is self-evident. We cannot evade it, we cannot temporize with it, we cannot pass it off as something that is insignificant. We will be known to historians as a people with the wisdom and foresight to preserve this magnificent fish or we will be known as barbarians who were unmindful of their blessings or too ignorant to preserve them for our children. There is no middle course in the matter.

January 1, 1947

REPORT OF THE COMMISSION TO STUDY THE ATLANTIC SALMON

To His Excellency Horace A. Hildreth, Governor of Maine,
State House, Augusta, Maine.

INTRODUCTION

Pursuant to act of the 92nd Legislature, Chapter 101, Resolves 1945, creating a commission to study the Atlantic Salmon, the undersigned were duly appointed as members of such commission and during the past two years have made such study as directed. We respectfully submit our report herewith:

For convenience there is here presented a brief statement pointing out the economic value of the Atlantic Salmon, acknowledging help received, and setting forth our recommendations, and this is followed by a more extended discussion, the whole constituting our report.

In our report we have not ventured to make any recommendations with respect to the stocking of particular streams with salmon fry as that function several years ago was delegated to the joint Salmon Research Committee established by agreement between the Departments of Sea and Shore Fisheries and Inland Fish and Game and the U. S. Fish and Wildlife Service. The work of that joint committee and its published reports which we have reviewed with care, in our opinion has been excellent and should be continued.

The Atlantic Salmon is regarded as the finest of all game fish on the Atlantic coast. Sportsmen spend thousands of dollars each year in the pursuit of this fish. The citizens of the State benefit by the large sums of money expended by sportsmen for travel, lodging, guide hire, tackle, and meals. It has been estimated and we believe conservatively that each salmon taken by sportsmen from out of the State results in an expenditure of not less than \$50.00. If we assume that local anglers spend at least \$10.00 for each fish caught, which we believe is a very low estimate, and if there are five times as many local anglers as out of state visitors, then it follows that each ten fish caught by anglers represent an outlay of at least \$100.00 or \$10.00 per fish. If all the facts could be gathered we believe this figure would be greatly increased.

For each fish taken commercially or caught illegally and sold, it is estimated that the seller receives on the average about \$5.00, thus it is evident that from the standpoint of the benefit to the people of Maine, commercial taking of this prize game fish should be restricted for a period of years until a sufficient run can be re-established so that it will again be good business for the State to permit them to be taken commercially. We therefore recommend:

1. That a suitable permanent agency be established with authority to make regulations governing the taking of Atlantic Sea run salmon by both sport and commercial fishermen, with the further proviso that such agency may establish different regulations on different streams and may change or amend such regulations in their discretion as conditions may require.

2. That such agency should also be entrusted with the responsibility of utilizing the funds appropriated to it or received from salmon licenses for the correction of conditions necessary to improve the run. In our opinion such agency after a few years should become entirely self supporting from the revenues derived from licenses. This with the increase of the runs, great financial benefits may reasonably be expected to accrue to the people of the State without further annual appropriations, but for the first few years some State appropriation will probably be required.

3. That a special license be required for the taking or marketing of Atlantic coast sea run salmon.

4. That the revenue from such salmon licenses be earmarked for carrying on the work of restoring the salmon runs.

In the following more extended report we have classified the rivers of the State in three main groups according to their possibilities as we see them and have made specific comments and recommendations for each. The first group consists of those rivers now frequented by salmon and where the salmon are holding their own or increasing:

Dennys	Pleasant
Machias	Narraguagus

The second includes those rivers that still have salmon but where the run appears to be declining:

Aroostook	Penobscot	East Machias	St. Croix
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The third group consists of those rivers that formerly supported

salmon but which due to pollution or other factors have no salmon to speak of at present:

Kennebec Androscoggin Saco Sheepscot Georges

We believe that the Atlantic Salmon constitute a great natural resource now sadly depleted but still capable of restoration to the great financial benefit of our people. What is needed is a sound program to clean up pollution and river obstructions where those factors are detrimental, a permanent agency of the State which has no other responsibility than to restore the salmon run, and a realization on the part of the people that forbearance and cooperation now will yield big dividends later. This requires the education of the public generally but it must be backed up with authority to control the small lawless minority who place temporary personal profit above long term public good. Because we believe the people of the State can be depended upon to decide wisely when they have the facts, we submit with confidence our recommendations and the observations on which they were based.

In the course of our work we received much help from State, Interstate, and Federal Agencies and from various sportsmen's groups and individuals too numerous to mention. We gratefully acknowledge all this assistance and wish to express our particular thanks to the three state departments concerned, namely, the Department of Inland Fish and Game, the Department of Sea and Shore Fisheries, and the Sanitary Water Board. In addition we wish to thank the Fish and Wildlife Service of the U. S. Department of the Interior and the Atlantic States Marine Fisheries Commission of which this State is a member. The continuing active interest of those two agencies has been of great assistance.

COMMISSION TO STUDY THE ATLANTIC SALMON

Signed FRANK L. BAKER, Chairman
W. LLOYD BYERS, Secretary
SAM L. WORCESTER

SUMMARY

This report is intended to call to your attention the condition now existing within the Rivers of Maine, which retard the development of a great resource, with the view to a State-wide program of conservation of this vast undeveloped annual wealth.

There is no doubt that with proper management and stream improvement salmon runs can be built up that will pay a large dividend upon the investment.

Formerly, Atlantic Salmon were abundant in every river tributary to the Atlantic north of the Hudson River. The only rivers without this splendid fish were those without suitable spawning grounds or blocked by natural falls.

Today remnants of Atlantic Salmon runs in the United States are found only in a few rivers in Eastern Maine.

This natural resource has been brought to a bad condition by impassable dams, deforestation, pollution by Industrial Development, by over fishing with traps and gill nets, and by destruction of young salmon during their seaward migration by water diversion tubes to power plants or turbines and by drought conditions. If the Atlantic Salmon is to be restored as much as present conditions permit, as they certainly should be, these forces of destruction must be corrected.

Because of the erection of dams, rivers were closed to the passage of migratory fish. This was the first phase in the depletion of Atlantic Salmon runs within our rivers. Over the years, increased development of industry has created a condition on rivers, within which salmon cannot reproduce.

Deforestation has been one of the principal factors that has led to present conditions. The cutting of our forests, and as often happens, the burning of cut over lands, has so exposed and destroyed the moisture retaining mechanism on water sheds that rivers do not maintain the flow of water as in former years.

The larger rivers of central and western Maine are so heavily polluted that regardless of properly constructed and located fishways, salmon will not enter beyond the estuary of rivers so handicapped. If we are to develop salmon runs in these rivers, industry and the public must cooperate in a determined effort to correct this condition.

If we are to increase the salmon in the unpolluted rivers of Maine, we should build water control dams, to hold a sufficient volume of water to maintain an adequate flow during drought periods.

Our observations have convinced us that the construction of approved fishways, control of predators, uniform regulations, and river-management will build up in a comparatively short time substantial runs of salmon in rivers so managed.

River influence is the volume of water entering the ocean. When salmon in migration approach the coast and sense a sufficient volume of fresh water, they follow that influence to the extent of the estuary.

It is our opinion that water control in rivers is one of the most important factors influencing salmon runs.

By protecting the spawning salmon in the rivers, by increasing the available spawning grounds and protecting the parr and smolt, is an important means of maintaining the salmon supply. The stocking of certain rivers is an important contribution to the over-all supply for all suitable rivers.

There should be a more intensive scientific study of this problem, for little is known of river capacity for spawning salmon, and methods of control of predators on our rivers.

Piscataqua River, boundary river between Maine and New Hampshire. In conjunction with members of the New Hampshire Planning and Development Commission, we have investigated conditions existing in the Piscataqua and Salmon Falls Rivers. While years ago salmon frequented these rivers in great numbers, present conditions due to pollution caused by mill waste, sawdust, and sewerage, have rendered them useless as fish rivers. However, the New Hampshire Great Bay Development Commission and the State of Maine Sanitary Water Board are taking measures toward the cleaning up of the Great Bay area.

Branch River is a short river in Kennebunk free from pollution being the source of water supply of the Kennebunk, Kennebunkport, and Wells Water District. This river, not many years ago, had a small salmon run. It is claimed that they were destroyed by highway construction work.

Saco River is an ideal salmon river having its source in Lake Ossipee and the White Mountains. It has a substantial flow of clear, cool water containing little pollution above Biddeford and Saco. There

are at least six power dams with only one fish ladder at Biddeford and that has been rendered useless by the diversion of water over a new dam.

The Power Company should be consulted with the view of increasing the water flow through the fishway. This, together with a small fish ladder at Union Falls, would give the Saco approximately twelve miles of river with adequate spawning grounds.

The City of Saco is considering the construction of a sewerage treatment plant for the purpose of removing raw sewerage from the Saco River and Goosefare Brook.

The **Androscoggin** and **Kennebec Rivers**, due to their polluted conditions, do not warrant consideration at this time.

The **Georges River** now maintains a small salmon run that is dwindling due to improper salmon ladders. The dams in this river are not large. Adequate salmon ladders could be put in without great expense. This river was stocked in recent years on advice of the U. S. Fish and Wildlife Service.

Sheepscot River. A small run of salmon exists here even though the river has not been stocked. This river contains about 40 miles of potential salmon waters, blocked by one cement dam at Head Tide. There are no salmon ladders or fishways of any kind. Some of the half dozen or less low, wooden dams might have to be bought and removed by the State. The remaining dams could have salmon ladders put in them at very little expense.

The **Duck Trap** and **Pemaquid Rivers** we have refrained from discussing as the U. S. Fish and Wildlife Service are at present conducting experiments with the Silver Salmon in these rivers.

The **Penobscot River** at Bangor once maintained one of the heaviest runs of salmon on the Atlantic Seaboard. Today records show a comparatively small run, although fishways have been constructed through all dams, and the river heavily stocked.

There is no doubt that commercial waste from industrial plants and sewerage from cities and towns along the river have caused young salmon to die on their way to the sea.

Then too, vast quantities of young salmon surely must be ground to death in passing through the whirling machinery of power plants.

First we believe that the river should be freed of pollution. Then salmon ladders should be properly placed and measures taken to

place protective screens of some sort in front of all water power machinery.

The Penobscot River with all its tributaries could without doubt maintain the greatest run of salmon in the State.

The **Narraguagus River** at Cherryfield is a river 50 miles in length fed by springs, lakes, and streams on which there are suitable spawning beds.

This river is free of all obstructions until it reaches Beddington Dam some 25 miles from its mouth. A fishway constructed through this dam would make 25 more miles of river available for salmon.

On this River this year some 500 to 600 salmon were reported taken with rod and reel.

The Narraguagus today is the most attractive salmon river in eastern Maine.

Pleasant River at Columbia Falls is a small river of clear water. Its source being Pleasant River Lake 30 miles from its mouth. This river is fed by many springs and brooks and flows over gravelly bottom during its entire length. It is a rapid flowing river with many suitable spawning beds.

We believe that commercial netting should be restricted.

Construction of an approved fishway through dam at head of tidewater, improvement of conditions obstructing salmon at Saco Falls, and construction of a small dam above said falls with fishway. With these improvements and proper management this river would develop into a fine salmon stream.

The **Machias River** is an ideal salmon river. Its length is seventy-five river miles, and has three suitable tributaries for spawning salmon and many spring fed streams for young salmon. It is free from pollution, and has a well forested watershed.

In 1946 the State took from the Machias 100 salmon for cultural purposes.

Stream improvement should be made at the head of tidewater. The fishway at Howard Dam should be changed to the north side of the river and an approved fishway constructed. The fishway at the Seaboard Paper Company dam at Whitneyville should be built on the north side of the river and should be of such dimensions that salmon will be influenced to enter. Water control and river manage-

ment are necessary if the salmon that enter this river are to reach their spawning grounds.

The **East Machias River** is not considered a suitable salmon stream. It is a slow moving river with a mud bottom. It is infested with pickerel, bass, and white perch. It has several small tributaries suitable for spawning fish and young salmon. Most notable is the Chase Mill Stream, an outlet of Gardners Lake, a splendid body of water where the bulk of salmon ran before it was closed by the erection of a screen.

If salmon runs are to be increased on this river, a proper fishway should be constructed at the Bangor Hydro Dam. Water diversion through a power plant should be screened both at intake and exhaust. There is no doubt that many young salmon are destroyed, during their migration to the sea by being drawn into this tube; and during the run of spawning salmon they are held at the exhaust of this power tube by water influence and are unable to locate the main stream for passage through the fishway. The screen at Gardners Lake outlet should be open during the salmon run.

The **Dennys River** is a stream of approximately thirty river miles of unpolluted water. Its source is Meddybemps Lake, with many spring fed streams emptying into it during its flow to Cobscook Bay. A turbulent stream with adequate spawning beds.

Until twenty years ago salmon were barred from entering the river by the erection of dams at the head of tidewater. Since then the dams have been destroyed, streams freed of obstructions, and a small salmon run has been developed. This run depends principally upon the correct temperature and volume of water during the summer months.

It is the opinion of many people of Dennysville that a water control dam should be constructed at Gilman Rips. The taking of eels and suckers should be encouraged and the destruction of seals that prey upon the salmon during their run through Cobscook Bay.

The **St. Croix River*** is one of the great future possibilities. At present salmon are unable to locate fishways, so they are unable to pass through. Fishway should be extended to deeper water, and water flow should be maintained throughout the season.

This river has a greater watershed than any river east of the Penobscot. Many spring fed lakes and streams enter this river; because of this many salmon enter it from May to late September.

With the great volume of water flowing in this river, we do not believe that the pollution from the pulp mill at Baileyville will prevent salmon running through if fishways are constructed at the dams at Baileyville and Grand Falls.

Aroostook River*. At present some salmon come out of the St. John River and ascend this river to Aroostook Falls where there is a salmon ladder. A few salmon get over, but a free run is not maintained at all times. Salmon that do get over now find themselves in a river that is polluted by waste from an alcohol plant and several starch factories. However, manufacturers and people living along the river are eager to restore it. There is no doubt that many more salmon would go through the gorge at Aroostook Falls were it put in proper condition, and pollution prevented in the river.

Suggestions in this report are made with the view to assuring the salmon a free run to their spawning grounds. This must necessarily be done if a run of salmon is to be established. We also believe that more attention should be given to assure the young salmon a safer passage to the sea.

We have endeavored in this report to offer suggestions that we believe to be essential if we are to increase the size of salmon run in our rivers.

Let Maine once more reestablish its once famous Atlantic Salmon.

Signed FRANK L. BAKER, Chairman
W. LLOYD BYERS, Secretary
SAM L. WORCESTER

* Proper management cannot be established on these two Rivers without agreements with the Province of New Brunswick.

MEASURES NEEDED TO ASSIST THE RESTORATION OF SALMON IN MAINE

(Covering a Report made to the Special Maine Salmon Commission
September 1945)

The U. S. Fish and Wildlife Service, just before the war, began preliminary research on Maine salmon as part of a long-range program designed to restore salmon runs to New England rivers. An agreement was drawn up and signed in 1941 between the Maine Department of Inland Fisheries and Game, the Maine Department of Sea and Shore Fisheries, and the U. S. Fish and Wildlife Service, establishing certain basic principles relating to salmon propagation and stocking procedures, and setting up a research committee to coordinate the salmon work of the three agencies. This project was interrupted during the war, but now has been resumed on an increased scale.

The Fish and Wildlife Service is encouraging this program because we are basically concerned with the maximum utilization of fishery resources. We are therefore interested in the restoration of potentially great salmon resources in Maine as well as in other North Atlantic states where suitable conditions might be established. With our research and salmon propagation facilities we can help Maine agencies find out how to bring back salmon runs and maintain them at the most productive level.

The state, however, is completely responsible for administering the fishery and for applying the results obtained in this cooperative work. It is the responsibility of the State to provide the most effective administrative machinery and legislation for carrying out needed restoration measures.

At an early stage in the restoration program it became clear that the continued expenditure of funds and effort on restoration work, would be futile unless it were possible to more effectively control the catch taken by sportsmen, commercial fishermen, and poachers. It is useless to expend time and effort on research, in improving conditions in the streams and on stocking fish, if the fish are taken in such quantities that insufficient numbers are left to return and spawn. It also became clear that the present divided responsibility and authority in Maine for administering salmon measures in fresh and salt water, made it difficult to carry out a consistent policy and apply an overall coherent management program.

In order to overcome these limitations on an effective restoration program two measures are urgently needed. These requirements are:

(1) A single administrative unit with authority over salmon in both fresh and salt water.

This administrative unit could consist of a three-man commission made up of the Commissioner of Inland Fisheries and Game, the Commissioner of Sea and Shore Fisheries, and a third member appointed by the Governor. The present Departments of Inland Fisheries and Game, and Sea and Shore Fisheries, possess warden forces covering both the fresh and salt water areas frequented by salmon. Consequently it would be uneconomical and inefficient to set up a duplicate warden force for salmon alone. By including the commissioners of these two departments on the proposed salmon commission, the facilities of their departments would be available for carrying out any measures decided upon by the Commissioners, and the interests of both departments would be represented in the activities of the Commission. The third member, having no commitments to either department, and without a full schedule of other duties, would be able to devote time and attention to following through on measures agreed upon by the three-man commission.

(2) The above Commission should be provided with legislative authority to control the salmon catch in both fresh and salt water; to appraise and buy up weir rights in and about the mouths of salmon rivers; to require licenses for all catches of salmon in salt as well as fresh water; to require licenses for all dealers handling salmon, and that they show that all of their purchases were made from licensed fishermen; and to carry out such other measures in regard to control of the catch as may be needed. The money from licenses should be earmarked for use in purchasing weir rights and for other salmon restoration work.

The above regulations would not be mandatory, but the Commission would have authority to apply them if and when needed. These measures would make it possible to obtain better control of salmon fishing and to reduce salmon poaching. Thus, during the early stages of salmon restoration work, while efforts were being concentrated upon developing adequate spawning runs, it would be possible to hold the taking of salmon to low levels. As the runs developed and more adequate spawning stocks were obtained, increasing numbers of salmon would be permitted to both sport and commercial fishermen.

Numerous other measures could be listed which would assist the salmon restoration program. However, the problems on various

rivers are different, and these measures must be considered in relation to the particular problems involved. They must be part of an overall long-range program if they are to have an effective part in improving the salmon runs.

Maine rivers fall into three general groups which present different problems:

Group A. Rivers with relatively small salmon runs which appear to be increasing in size owing to general improvement in river conditions and to construction of fishways. The first problem in such cases is to see that conditions continue to improve.

This requires:

1. Control of catch, sport, commercial, and illegal.
2. Maintenance and improvement of fishways.
3. Decrease in pollution where such pollution exists.
4. Control and reduction of predator species, if they are an important factor in limiting the survival of young salmon.

Group B. Rivers with small runs which are stationary or decreasing in size in spite of extensive planting of young salmon (Penobscot).

The first problem is to determine what is limiting the runs:

1. Inability of adults to migrate upstream to the spawning grounds (dams and pollution)?
2. Inability of the young to survive in the tributaries or main river (predators and pollution)?
3. Inability of young salmon to return to the sea (dams, power turbines, pollution)?

If the limiting factors can be determined, then corrective measures can be developed and applied.

Group C. Rivers now without salmon.

The problem here is to

1. Determine what conditions make the rivers unsuitable.
2. Correct these conditions if possible.
3. Stock favorable sections with young salmon to establish runs.

In view of the numerous and varied requirements of these many rivers, it is obvious that it will be impossible to attack all the problems at once. Consequently if it is decided that a new commission with authority over salmon be established, this commission should be authorized to determine which restoration measures should first be

applied, and it should be given authority to carry out these measures. In this way the State would be assured of a continuing program which would benefit from the continued attention of the three Commissioners. The Commissioners in turn would be able to make use of the increasing quantity of biological data which will be obtained by State and Fish and Wildlife Service biologists from year to year.

Maine salmon have been lost as a major resource for many decades and past attempts at destroying them have not been successful. However, prospects for success now appear promising providing an effective administrative agency is set up with authority to carry out an effective long-range program and apply restoration measures developed by sound biological research.

WILLIAM C. HARRINGTON¹

Dec. 30, 1946

Copies to: The Director

Mr. Baker

Mr. Reed

Mr. Stobie

¹ Aquatic Biologist, in Charge North Atlantic Fishery Investigations, Fish and Wildlife Service, United States Department of the Interior.

