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THE NEW ENGLAND SALMON RESTORATION PROGRAM

Undertaken by the Fish and Wildlife Service in Cooperation with the Maine Departments of Inland Fisheries and Game, and Sea and Shore Fisheries

by

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The Atlantic salmon, potentially of great importance to both the New England angler and commercial fisherman, once was abundant in nearly all of the New England rivers. It is still abundant in rivers of Eastern Canada, Newfoundland, and Labrador, but it has practically disappeared from New England rivers except for a remnant in the Penobscot River and limited numbers in the Narraguagus, Pleasant, Machias, and Dennys Rivers. Efforts to prevent further decline of the Atlantic salmon and to restore depleted runs, were begun by Atkins nearly three quarters of a century ago, but in spite of his efforts and the continued artificial propagation and distribution of young salmon since then, the runs continued to decline until recent years.

The present salmon restoration program being carried on by the Fish and Wildlife Service in cooperation with the Maine Departments of Inland Fisheries and Game, and Sea and Shore Fisheries, is an outgrowth of the salmon interest and activities of representatives of the National Wildlife Federation, the Fish and Wildlife Service, and the two Maine fisheries departments. In the late 1930's it became obvious to some of those individuals most interested in the future of the Atlantic salmon, that past restoration methods had not proven successful, and that a radically new approach to the problem was necessary if salmon were again to be made abundant in New England streams. After some discussion of the problem among David Aylward, President of the National Wildlife Federation, George J. Stobie, Maine Commissioner of Inland

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Fisheries and Game, and William C. Herrington and George A. Rounsefell, biologists of the Fish and Wildlife Service, the biologists at the request of Mr. Aylward drafted a preliminary program in September 1939. This program was discussed and approved at a meeting of the Conservation Officers of Maine, New Hampshire, Vermont, Massachusetts, Connecticut, and New York, held in the Cambridge, Mass., laboratory of the Fish and Wildlife Service. The program was presented by William C. Herrington at the New England Game Conference in March 1940, and at the meeting of the American Fisheries Society[2/] in September 1940. It forms the basis of the present salmon program.

Preliminary surveys made by George A. Rounsefell showed that the only New England streams in reasonably good condition for salmon, were located in Maine; consequently, field work so far has been concentrated in that State. When the most important factors limiting salmon survival in Maine streams have been evaluated and brought under control, and success has been achieved in developing and improving salmon runs in Maine rivers, it is planned to extend the program to cover the more difficult conditions in the other New England States.

In order to facilitate the carrying out of the cooperative program in Maine, an agreement was worked out with the two Maine departments concerned -- Inland Fisheries and Game, and Sea and Shore Fisheries -- covering the commitments of the two departments and the Fish and Wildlife Service, and establishing certain basic principles relating to salmon propagation and stocking procedures in Maine. This agreement was signed in October 1941 by George J. Stobie, Commissioner of Inland Fisheries and Game, Arthur R. Greenleaf, Commissioner of Sea and Shore Fisheries, and Charles E. Jackson, Acting Director, Fish and Wildlife Service. A research committee set up by this agreement and including

[2/] William C. Herrington and George A. Rounsefell, Restoration of the Atlantic Salmon in New England. Vol. 70 (1940) American Fisheries Society.

representatives from the three organizations involved, has served since then to coordinate the work of the three agencies.

Field surveys were begun in 1940 by George A. Rounsefell, and a downstream weir was installed in 1941 in the Pemaquid River, in connection with observations on the spawning success of a small run of king salmon returning to the Pemaquid in 1940 from an accidental escapement from a Biscay Pond stocking experiment, made by the State to provide fresh water angling. In that year a supply of Atlantic salmon eggs also was obtained from the Canadian Department of Fisheries for further experimental work in the St. George River, and arrangements were made for obtaining a supply of silver salmon eggs from the Pacific Coast.

Work on the salmon project was reduced to an absolute minimum during the war, covering only the essential follow-up of marking and stocking experiments, but it is being resumed on a somewhat more adequate scale in 1946. The program from 1940 to 1944 was under the supervision of Dr. George A. Rounsefell. Since his transfer to Washington in 1944, Mr. Louis Stringer has carried on the project.

In addition to the salmon restoration program outlined in this report, which is being carried on under the supervision of Fish and Wildlife Service biologists with the cooperation of the other interested organizations mentioned above, the Maine Department of Inland Fisheries and Game is carrying on other work on salmon, and is responsible for the administration of salmon conservation measures affecting the fresh water phase of the salmon life cycle; the Craig Brook hatchery of the Fish and Wildlife Service is continuing the hatching, rearing, and planting of salmon in some rivers other than those included in the present restoration program; and some work was done on the Dennys and Penobscot Rivers by University of Maine graduate students with the assistance of Kendall Fellowships.

Most of the supply of Atlantic salmon eggs used in experiments in the St. George River was obtained from the Canadian Department of Fisheries through the cooperation of Mr. James A. Redd, Director of Fish Culture; the silver salmon eggs were obtained by the Fish and Wildlife Service through an exchange agreement with the States of Oregon and Washington. The balance of the Atlantic salmon eggs used in the various experiments came from salmon trapped in the Penobscot and Machias Rivers. The hatching of all salmon eggs was carried out by the Craig Brook hatchery of the Fish and Wildlife Service, and the rearing was done by the Craig Brook hatchery and Tunk Pond hatchery of the Maine Department of Inland Fisheries and Game. Transportation and planting of young Atlantic salmon was handled by the Craig Brook hatchery and the Department of Inland Fisheries and Game, while transportation and planting of silver salmon was handled by the Department of Sea and Shore Fisheries. The Department of Inland Fisheries and Game furnished trap watchers for the Penobscot River, while the Department of Sea and Shore Fisheries has supplied watchers for the Pemaquid River.

The following outline provides a brief resumé of the objectives of the work, the program, work accomplished to date, and plans for 1946.

OUTLINE

of

OBJECTIVES, PROGRAM, AND PROGRESS

Objectives

The principal objectives of the work are:

1. To determine the practical possibilities of restoring salmon to streams now devoid of salmon and of increasing the small runs now existing in a few other streams.

2. To develop the best specific management methods for each stream studied and insofar as possible, to develop overall methods for the general application to other streams.

Program

The principal points covered by the program are:

1. Survey of the most promising New England rivers to show their present condition and the possibilities for salmon restoration.

2. Inauguration of restoration work on two or three favorable streams by obtaining a supply of young salmon for stocking these streams. These projects will serve as a laboratory for studying restoration methods and demonstrating restoration possibilities.

3. Encourage adoption of State laws controlling the taking of salmon in salmon rivers and within bays or other suitable areas embracing the mouths of salmon rivers.

4. Evaluate salmon mortality during that part of the life cycle spent in the stream and that in the ocean, by means of downstream and upstream weirs, traps, and electric and net sampling techniques; and correlating the stream mortalities with environmental factors such as predators, competitors, pollution, temperatures, food, and physical characteristics of the stream.

5. Determine the best age and season to plant hatchery stock and compare the returns from natural and artificial propagation, by marking hatchery stock planted at different ages and seasons, and evaluating the returns by trapping the adults on their upstream migration.

6. On the basis of the above information, develop the most effective management methods for each stream.

7. A thorough study of the possibilities and possible advantages to be derived from the introduction of a desirable species of West Coast salmon such as the silver salmon.

8. Determine the type of fishway most suitable for New England streams and the principles determining the best location of the entrance. Study the problems regarding upstream and downstream migrations imposed by power plants on the Penobscot and Connecticut Rivers, which take the entire flow of the river during most of the year.

9. Help coordinate the work of the various organizations interested in this subject.

Work accomplished

Because of limited personnel and the war, only preliminary work has been carried out to date. With respect to the points enumerated above, this includes:

1. Preliminary survey of the Pennaquid and St. George Rivers.

2. Stocking of marked Atlantic salmon in the St. George River. This includes young from salmon eggs obtained from Canada as well as some from Penobscot eggs.

3. Encouragement of and cooperation with Maine representatives in setting up the present Maine Salmon Commission and advising them on measures needed for controlling the taking of salmon in the rivers and bays, and on an improved administrative set-up for handling salmon problems in fresh and salt water.

4. Only preliminary work has been done on mortality rates.

5. Marked Atlantic and silver salmon have been planted at various seasons and ages in the Penobscot, St. George, Pemaquid, and Dunktrap rivers. Counts will be obtained of the returns from these experiments by means of traps in the Penobscot, St. George, and Pemaquid fishways, to determine the best survival from the different plants. The taking of alternate adult salmon from the Bangor dam trap in the Penobscot for artificial propagation was recommended some time ago and partially accomplished in 1944 and 1945. This will make possible the comparison of returns from the natural spawners with those from hatchery plants.

6. No progress has yet been possible on management methods.

7. Silver salmon eggs have been obtained by the Fish and Wildlife Service from the Pacific Coast and to date 136,000 young have been planted in the Pemaquid and Dunktrap Rivers, some in the Spring, the balance in the following Fall. No returns have yet been obtained from this work.

8. Preliminary experiments have been begun with several types of model fishways and preliminary surveys and studies of some of the Connecticut dams and power plants have been completed.

9. Coordination of salmon work in Maine was encouraged through the drafting and sponsoring in 1941 of a Cooperative Agreement between the Maine Departments of Inland Fisheries and Game and the Sea and Shore Fisheries, and the Fish and Wildlife Service, and the setting up of a Salmon Research Committee on which these three organizations were represented. Conferences and discussions with salmon clubs and other interested groups have been carried out. A study of the Holyoke fishway problem was conducted in cooperation with the Massachusetts Division of Marine Fisheries, and preliminary surveys have been made of some sections of the Connecticut River and tributaries in connection with recommendations to the Federal Power Commission.

PLANS FOR 1946

Plans covering the various program points are as follows:

1. Complete the surveys of the St. George, Pemaquid, and Ducktrap Rivers to obtain detailed information on spawning grounds, riffle areas, and other physical and biological conditions.

2. No stocking is planned for the St. George River, since no young salmon are available this year for this purpose.

3. Continue cooperation with Chairman Baker and other members of the Maine Salmon Commission, and with Commissioner Stobie, of the Department of Inland Fisheries and Game, Commissioner Reed, of the Department of Sea and Shore Fisheries, and other interested organizations, to obtain needed legislation for more effective salmon administration.

4. Begin the study of stream mortality as soon as weirs are completed (we are now experimenting with a new type weir which, if successful, will be cheaper and easier to install than the conventional type) and the electric shocking machine is available. Studies will include census of predator fish and competitors as well as of salmon.

5. Experiments on season and age for planting young salmon will be continued, and the work required for the comparison of natural and artificial propagation in the Penobscot will be emphasized. Traps for adult salmon will be maintained in fishways in the Penobscot, St. George, and Pemaquid Rivers, to determine the returns from the various stocking experiments. If possible, an upstream weir will be installed in the Ducktrap River to trap any silver salmon returning from 1944 stocking.

7. A census of the downstream run of silver salmon in the Pemaquid will be obtained from a downstream weir installed at the mouth of the river to determine the stream mortality for 1945 and 1946 stocking.

8. Experiments on fishway types, design of entrances, and location, will be continued and increased, using models and later full-scale fishways.

9. Through work of the Salmon Research Committee, the Maine Salmon Agreement, and contacts with various other Maine organizations, encouragement will be continued for the coordination of salmon work in Maine. Cooperative work with the Massachusetts Division of Marine Fisheries will be continued on the Holyoke fishway. Some further survey work on the Connecticut River may be possible in connection with recommendations to the Federal Power Commission.