INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

APPOINTED UNDER A CONVENTION BETWEEN CANADA AND THE UNITED STATES FOR THE PROTECTION, PRESERVATION AND EXTENSION OF THE SOCKEYE SALMON FISHERIES IN THE FRASER RIVER SYSTEM

ANNUAL REPORT

1937 AND 1938

COMMISSIONERS

EDWARD W. ALLEN
B. M. BRENNAN
A. L. HAGER
CHARLES E. JACKSON
TOM REID
A. J. WHITMORE

WM. A. FOUND (1937-1938).

NEW WESTMINSTER, B. C.
CANADA
1939

REPORT OF THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION FOR THE YEARS 1937 AND 1938

The Sockeye Salmon Fisheries Convention was signed on May 26, 1930, but ratifications were not exchanged until July 28, 1937, after certain understandings were arrived at. The text of the Convention is appended to this report. It may be summarized here because of its importance to a clear understanding of the policy and action of the Commission.

The Convention applies to the territorial waters and high seas westward of Canada and the United States from a line between Bonilla Point, Vancouver Island and Tatoosh Island, Washington. It includes all such waters between 48 and 49 degrees north latitude, excepting Barkley Sound and Nitinat Lake. Eastward of this line, it includes the Strait of Juan de Fuca, the Strait of Georgia as far as Lasqueti Island—excepting Howe Sound and the waters east of Whidby Island—and the Fraser River and its tributaries.

Regulations enacted by the International Pacific Salmon Fisheries Commission are enforced within the territories of each nation solely by the government of that nation. On the high seas, an offending vessel may be seized by either nation, but can be prosecuted only by its own. Removal of obstructions to migration may be *recommended* to the two governments; and in each case where action is agreed upon, any expense will be borne equally by the two. Land needed by the Commission may not be acquired by it, but each High Contracting Party shall "acquire and place at the disposition of the Commission any land within its territory required" for its purposes.

The Convention was ratified subject to the following conditions or understandings:

(1) That the International Pacific Salmon Fisheries Commission shall have no power to authorize any type of fishing gear contrary to the laws of the State of Washington or the Dominion of Canada;

(2) That the Commission shall not promulgate or enforce regulations until the scientific investigations provided for in the Convention have been made, covering two cycles of sockeye salmon runs, or eight years; and

(3) That the Commission shall set up an Advisory Committee composed of five persons from each country who shall be representatives of the various branches of the industry (purse seine, gill net, troll, sport fishing, and one other), which Advisory Committee shall be invited to all non-executive meetings of the Commission and shall be given full opportunity to examine and to be heard on all proposed orders, regulations or recommendations.

The Convention establishes the International Pacific Salmon Fisheries Commission. There are six Commissioners, three from each country. Two Commissioners from each country must concur in any action to make it effective.

The Commission is empowered to investigate the natural history of the sockeye salmon, hatchery methods, spawning ground conditions and related matters. It may conduct fish cultural operations, improve spawning grounds, stock the Fraser with sockeye by such methods as it may deem advisable, and recommend removal of obstructions to migration. It is empowered to limit or prohibit the taking of sockeye salmon in Convention waters, provided that when this is done it will apply to the whole and not to a part of each of three areas, namely waters outside a line marking the entrance to the Strait of Juan de Fuca, United States waters inside the entrance line, and Canadian waters inside the entrance line. The regulations may differ from one of these areas to another. They will remain in force until action is taken by the Commission to change or revoke them. To the end that there shall be a proper escapement of sockeye salmon, the Commission may regulate the sizes of mesh in all fishing gear and appliances used in Convention waters during the chinook (spring) salmon season (which is usually from early May to late October). During the remainder of the year (hence November to April) any gear authorized by the respective governments can be used in their own waters. But on the high seas only such fishing gear may be used in any open season as the Commission may approve. The catch shall be distributed as equally between the two countries as is practicable.

The Commission met in Vancouver, October 28 and 29, 1937, as soon as possible after the appointment of its members. The Commission as appointed consisted of the following:

Canadian:

Wm. A. Found, Deputy Minister of Fisheries, Ottawa, Ontario.
A. L. Hager, Canadian Fishing Company, Vancouver, British Columbia.
Tom Reid, Member of Parliament, New Westminster, British Columbia.

United States:

Edward W. Allen, Attorney, Northern Life Tower, Seattle, Washington.
B. M. Brennan, State Director of Fisheries, Smith Tower, Seattle, Washington.
Chas. E. Jackson, Deputy Commissioner of Fisheries, Washington, D. C.

Mr. A. L. Hager was elected Chairman and Mr. B. M. Brennan, Secretary. The offices of the Commission were established at New Westminster, B. C. At this meeting rules of procedure were adopted, and Dr. W. F. Thompson was chosen as Director of Investigations.

In February 1939 Wm. A. Found resigned and was replaced by A. J. Whitmore, Department of Fisheries, Ottawa, Canada.

The Commission held its second meeting in Ottawa, Canada, on January 26, 27 and 28, 1938.

At this, methods of procedure in regard to finances were arranged. The Canadian government agreed to pay all joint expenses incurred by the Commission to be reimbursed later by the United States for its share.

An Advisory Committee was appointed, as required by the third understanding attached to the treaty prior to final exchange of ratifications (see above). The appointees were as follows:

Branch represented	Canada	United States
Purse seining	M. E. Guest	Lee Makovitch
Gill netting	F. Rolley	Chester Carlson
Trolling	W. A. Hawley	Sevrin Leite
Sport fishing	M. S. Black	Ken McLeod
Packing	Richard Nelson	C. J. Collins

The Commission authorized the appointment of the following as members of a Scientific Council to give its Director such advice as he might find necessary.

Canada:

Dr. A. T. Cameron, Fisheries Research Board of Canada, Winnipeg.
Dr. A. H. Hutchinson, University of British Columbia, Vancouver.
Dr. W. A. Clemens, Director, Dominion Biological Station, Nanaimo.

United States:

Dr. John E. Guberlet, University of Washington, Seattle.
Mr. Loyd Royal, Washington State Department of Fisheries, Seattle.
Dr. F. A. Davidson, United States Bureau of Fisheries, Seattle.

The Scientific Council met August 26, 1938, in Vancouver, B. C. The proposed program was discussed and endorsed.

The Commission met again September 22, 23 and 24, 1938, in Vancouver, B. C. Various matters were discussed, including the program and the budget necessary.

The Canadian Department of Fisheries having asked for an opinion on the use of long deep sea gill nets, the Commission expressed its approval of action restricting the length of such nets.

A request was made of the Canadian government that the Commission be notified of any proposed work which would affect the sockeye spawning grounds on the Fraser River. The text of the resolution was as follows:

> "Resolved that in view of the provisions of Article III of the Sockeye Salmon Fisheries Convention of May 26th, 1930, the International Pacific Salmon Fisheries Commission respectfully requests the Canadian government to take such action as will ensure the Commission being notified and consulted before authority is given by the government concerned for carrying out any project in the Fraser River watershed that will result in modifying any spawning area therein or in the damming, pollution, or diversion, of any waters thereof that are used by migrating fish either in the adult or young stages."

On September 23 the Commission met with the Advisory Committee. The Treaty and the function of the Committee was discussed and the following statement made by the Commission:

"Under the Treaty and understandings,

1. What the Advisory Committee members do among themselves is a matter for them to determine.
2. The Commission has only power to pay the expenses of the members of the Advisory Committee, however, to non-executive meetings of the Commission to which the Advisory Committee is invited.
3. The Director is only authorized at this time to deal with scientific investigations and not with any control of the industry.
4. The Commission and Director welcome discussion of matters of scientific investigation with the Director.
5. Any matter of orders, regulation and recommendation when the Commission shall have that power, should be taken up with the Commission rather than with the Director."

The program to be followed by the Commission was discussed in the light of its functions as defined in the Treaty. It has the first duty of making "a thorough investigation into the natural history of the Fraser River sockeye salmon, into hatchery methods, spawning ground conditions and other related matters." But it has in addition several executive functions, the principal of which are (1) regulation, (2) the conduct of fish cultural operations and (3) the recommendation of removal of obstructions to migrations. In each of these it was concluded that investigations to establish facts upon which action could be based were imperative and must be begun immediately if they were to be completed in the two life cycles set by the Convention. In each function of the Commission the existing situation emphasized the desirability and importance of investigation as a first duty of the Commission.

Since powers of regulation of the catch were withheld for eight years by the second understanding attached to the Convention, that period of time was available before regulation would be begun. In that time, covering two four-year life cycles of the sockeye salmon, the necessary facts must be gathered, and an organization for regulation must be built. To secure the immediate facts and develop the methods necessary is a major undertaking. There are many distinct "runs" of sockeye in the Fraser, each of a distinct "race," very unequally depleted. To remedy this depletion, those races in unsatisfactory condition must be aided. Means are required of determining and measuring such things as escapement to the spawning grounds, time or place of occurrence of each "race" of salmon, a knowledge of which is at present largely lacking. The methods of ascertaining them are not well known, even after many years of scientific studies on salmon by many governmental agencies, Canadian and United States. It is plain that eight years is not more than sufficient, if it is that, in view of the difficulty and magnitude of the problem.

The desirability of, and the manner of executing a plan for propagation of the sockeye, also requires careful study. A policy of fish cultural operations for the sockeye of the Fraser had been carried on for many years by Canada. The same had been tried in Alaska. Both attempts were abandoned. The utility of such operations for salmon is, indeed, much in dispute everywhere. Under such circumstances, it is plain that the Commission must proceed with care, despite

the urgent need there may be for such assistance to the runs. Immediate action can not be taken, as it is not known of what character it should be or where it should be begun. The necessary preliminary investigations are, however, closely related to, and in fact largely the same, as those necessary for purposes of regulation, and should be pushed energetically and simultaneously. The ultimate adoption of methods of propagation must await future decision.

The recommendation for removal of obstacles necessitates a survey of existing conditions before action can be taken. It must be remembered that the Canadian Department of Fisheries, with a staff throughout the Fraser River, has had experience with these obstacles over many years. It is not to be expected that the Commission will find itself in a position to improve at once and radically, upon the recommendations of the Department. It can, however, carry through a more extensive investigation and study than has previously been possible, in order that the resources of both governments may be brought to bear immediately if any change in the existing conditions is then shown desirable.

Along these lines the investigations were planned during the year 1938. There is appended a report by the Director in summary of the operations carried out. Detail reports must be awaited when the several investigations have progressed sufficiently far and the material has been analyzed.

The permanent program of the Commission will be developed as the facts upon which it must be based come to light. It has been formulated in tentative form, and will be developed as rapidly as possible. It is plainly not desirable to allow any policy to be determined by other means than careful investigation, nor to commit the Commission in ways which may hamper its future development along productive lines.

The Commission has been cordially aided by those agencies which have been active in study or control of the Fraser River sockeye run over many years. Valuable files, containing observations and records have been placed at the disposal of the Commission in the offices of the Canadian Department of Fisheries, J. A. Motherwell, Chief Inspector, and R. W. MacLeod, Supervisor of Fisheries, of the district which includes the Fraser River. The Department of Fisheries of the State of Washington has provided valuable statistics. The advice of the Fisheries Research Board of Canada, Dr. W. A. Clemens, Director, which has since 1924 conducted the experiments on sockeye propagation and predator control at Cultus Lake has been invaluable.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

A. L. HAGER, *Chairman*
EDWARD W. ALLEN
CHARLES E. JACKSON
TOM REID
A. J. WHITMORE
B. M. BRENNAN, *Secretary*

APPENDIX A

SOCKEYE SALMON FISHERIES CONVENTION*

Signed at Washington, May 26, 1930.
Ratification advised by the Senate of the United States, subject to understandings, June 16, 1936.
Ratified by His Majesty in respect of Canada, June 26, 1937.
Ratified by the President of the United States, subject to the said understandings, July 23, 1937.
Ratifications exchanged at Washington, July 28, 1937.
Proclaimed by the President of the United States, August 4, 1937.

The President of the United States of America and His Majesty the King of Great Britain, Ireland and the British dominions beyond the Seas, Emperor of India, in respect of the Dominion of Canada, recognizing that the protection, preservation and extension of the sockeye salmon fisheries in the Fraser River system are of common concern to the United States of America and the Dominion of Canada; that the supply of this fish in recent years has been greatly depleted and that it is of importance in the mutual interest of both countries that this source of wealth should be restored and maintained, have resolved to conclude a Convention and to that end have named as their respective plenipotentiaries:

The President of the United States of America: Mr. Henry L. Stimson, Secretary of State of the United States of America; and

His Majesty, for the Dominion of Canada: The Honorable Vincent Massey, a member of His Majesty's Privy Council for Canada and His Envoy Extraordinary and Minister Plenipotentiary for Canada at Washington;

Who, after having communicated to each other their full powers, found in good and due form, have agreed upon the following Articles:

ARTICLE I

The provisions of this Convention and the orders and regulations issued under the authority thereof shall apply, in the manner and to the extent hereinafter provided in this Convention, to the following waters:

1. The territorial waters and the high seas westward from the western coast of the United States of America and the Dominion of Canada and from a direct line drawn from Bonilla Point, Vancouver Island, to the lighthouse on Tatoosh Island, Washington,—which line marks the entrance to Juan de Fuca Strait,—and embraced between 48 and 49 degrees north latitude, excepting therefrom, however, all the waters of Barklay Sound, eastward of a straight line drawn from Amphitrite Point to Cape Beale and all the waters of Nitinat Lake and the entrance thereto.

2. The waters included within the following boundaries:

Beginning at Bonilla Point, Vancouver Island, thence along the aforesaid direct line drawn from Bonilla Point to Tatoosh Lighthouse, Washington, described in paragraph numbered 1 of this Article, thence to the nearest point of Cape Flattery, thence following the southerly shore of Juan de Fuca Strait to

*As published by the United States, Treaty Series No. 918.

Point Wilson, on Quimper Peninsula, thence in a straight line to Point Partridge on Whidbey Island, thence following the western shore of the said Whidbey Island, to the entrance to Deception Pass, thence across said entrance to the southern side of Reservation Bay, on Fidalgo Island, thence following the western and northern shore line of the said Fidalgo Island to Swinomish Slough, crossing the said Swinomish Slough, in line with the track of the Great Northern Railway, thence northerly following the shore line of the mainland to Atkinson Point at the northerly entrance to Burrard Inlet, British Columbia, thence in a straight line to the southern end of Bowen Island, thence westerly following the southern shore of Bowen Island to Cape Roger Curtis, thence in a straight line to Gower Point, thence westerly following the shore line to Welcome Point on Seechelt Peninsula, thence in a straight line to Point Young on Lasqueti Island, thence in a straight line to Dorcas Point on Vancouver Island, thence following the eastern and southern shores of the said Vancouver Island to the starting point at Bonilla Point, as shown on the United States Coast and Geodetic Survey Chart Number 6300, as corrected to March 14, 1930, and on the British Admiralty Chart Number 579, copies of which are annexed to this Convention and made a part thereof.

3. The Fraser River and the streams and lakes tributary thereto.

The High Contracting Parties engage to have prepared as soon as practicable charts of the waters described in this Article, with the above described boundaries thereof and the international boundary indicated thereon. Such charts, when approved by the appropriate authorities of the Governments of the United States of America and the Dominion of Canada, shall be considered to have been substituted for the charts annexed to this Convention and shall be authentic for the purposes of the Convention.

The High Contracting Parties further agree to establish within the territory of the United States of America and the territory of the Dominion of Canada such buoys and marks for the purposes of this Convention as may be recommended by the Commission hereinafter authorized to be established, and to refer such recommendations as the Commission may make as relate to the establishment of buoys or marks at points on the international boundary to the International Boundary Commission, United States-Alaska and Canada, for action pursuant to the provisions of the Treaty between the United States of America and His Majesty, in respect of Canada, respecting the boundary between the United States of America and the Dominion of Canada, signed February 24, 1925.

ARTICLE II

The High Contracting Parties agree to establish and maintain a Commission to be known as the International Pacific Salmon Fisheries Commission, hereinafter called the Commission, consisting of six members, three on the part of the United States of America and three on the part of the Dominion of Canada.

The Commissioners on the part of the United States of America shall be appointed by the President of the United States of America. The Commissioners

on the part of the Dominion of Canada shall be appointed by His Majesty on the recommendation of the Governor General in Council.

The Commissioners appointed by each of the High Contracting Parties shall hold office during the pleasure of the High Contracting Party by which they were appointed.

The Commission shall continue in existence so long as this Convention shall continue in force, and each High Contracting Party shall have power to fill and shall fill from time to time vacancies which may occur in its representation on the Commission in the same manner as the original appointments are made. Each High Contracting Party shall pay the salaries and expenses of its own Commissioners, and joint expenses incurred by the Commission shall be paid by the two High Contracting Parties in equal moieties.

ARTICLE III

The Commission shall make a thorough investigation into the natural history of the Fraser River sockeye salmon, into hatchery methods, spawning ground conditions and other related matters. It shall conduct the sockeye salmon fish cultural operations in the waters described in paragraphs numbered 2 and 3 of Article I of this Convention, and to that end it shall have power to improve spawning grounds, construct, and maintain hatcheries, rearing ponds and other such facilities as it may determine to be necessary for the propagation of sockeye salmon in any of the waters covered by this Convention, and to stock any such waters with sockeye salmon by such methods as it may determine to be most advisable. The Commission shall also have authority to recommend to the Governments of the High Contracting Parties removing or otherwise overcoming obstructions to the ascent of sockeye salmon, that may now exist or may from time to time occur, in any of the waters covered by this Convention, where investigation may show such removal of or other action to overcome obstructions to be desirable. The Commission shall make an annual report to the two Governments as to the investigations which it has made and other action which it has taken in execution of the provisions of this Article, or of other Articles of this Convention.

The cost of all work done pursuant to the provisions of this Article, or of other Articles of this Convention, including removing or otherwise overcoming obstructions that may be approved, shall be borne equally by the two Governments, and the said Governments agree to appropriate annually such money as each may deem desirable for such work in the light of the reports of the Commission.

ARTICLE IV

The Commission is hereby empowered to limit or prohibit taking sockeye salmon in respect of all or any of the waters described in Article I of this Convention, provided that when any order is adopted by the Commission limiting or prohibiting taking sockeye salmon in any of the territorial waters or on the High Seas described in paragraph numbered 1 of Article I, such order shall extend to all such territorial waters and High Seas, and, similarly, when in any

of the waters of the United States of America embraced in paragraph numbered 2 of Article I, such order shall extend to all such waters of the United States of America, and when in any of the Canadian waters embraced in paragraphs numbered 2 and 3 of Article I, such order shall extend to all such Canadian waters, and provided further, that no order limiting or prohibiting taking sockeye salmon adopted by the Commission shall be construed to suspend or otherwise affect the requirements of the laws of the State of Washington or of the Dominion of Canada as to the procuring of a license to fish in the waters on their respective sides of the boundary, or in their respective territorial waters embraced in paragraph numbered 1 of Article I of this Convention, and provided further that any order adopted by the Commission limiting or prohibiting taking sockeye salmon on the High Seas embraced in paragraph numbered 1 of Article I of this Convention shall apply only to nationals and inhabitants and vessels and boats of the United States of America and the Dominion of Canada.

Any order adopted by the Commission limiting or prohibiting taking sockeye salmon in the waters covered by this Convention, or any part thereof, shall remain in full force and effect unless and until the same be modified or set aside by the Commission. Taking sockeye salmon in said waters in violation of an order of the Commission shall be prohibited.

ARTICLE V

In order to secure a proper escapement of sockeye salmon during the spring or chinook fishing season, the Commission may prescribe the size of the meshes in all fishing gear and appliances that may be operated during said season in the waters of the United States of America and/or the Canadian waters described in Article I of this Convention. At all seasons of the year the Commission may prescribe the size of the meshes in all salmon fishing gear and appliances that may be operated on the High Seas embraced in paragraph numbered 1 of Article I of this Convention, provided, however, that in so far as concerns the High Seas, requirements prescribed by the Commission under the authority of this paragraph shall apply only to nationals and inhabitants and vessels and boats of the United States of America and the Dominion of Canada.

Whenever, at any other time than the spring or chinook salmon fishing season, the taking of sockeye salmon in waters of the United States of America or in Canadian waters is not prohibited under an order adopted by the Commission, any fishing gear or appliance authorized by the State of Washington may be used in waters of the United States of America by any person thereunto authorized by the State of Washington, and any fishing gear or appliance authorized by the laws of the Dominion of Canada may be used in Canadian waters by any person thereunto duly authorized. Whenever the taking of sockeye salmon on the High Seas embraced in paragraph numbered 1 of Article I of this Convention is not prohibited, under an order adopted by the Commission, to the nationals or inhabitants or vessels or boats of the United States of America or the Dominion of Canada, only such salmon fishing gear and appliances as may have been approved by the Commission may be used on such High Seas by said nationals, inhabitants, vessels or boats.

ARTICLE VI

No action taken by the Commission under the authority of this Convention shall be effective unless it is affirmatively voted for by at least two of the Commissioners of each High Contracting Party.

ARTICLE VII

Inasmuch as the purpose of this Convention is to establish for the High Contracting Parties, by their joint effort and expense, a fishery that is now largely nonexistent, it is agreed by the High Contracting Parties that they should share equally in the fishery. The Commission shall, consequently, regulate the fishery with a view to allowing, as nearly as may be practicable, an equal portion of the fish that may be caught each year to be taken by the fishermen of each High Contracting Party.

ARTICLE VIII

Each High Contracting Party shall be responsible for the enforcement of the orders and regulations adopted by the Commission under the authority of this Convention, in the portion of its waters covered by the Convention.

Except as hereinafter provided in Article IX of this Convention, each High Contracting Party shall be responsible, in respect of its own nationals and inhabitants and vessels and boats, for the enforcement of the orders and regulations adopted by the Commission, under the authority of this Convention, on the High Seas embraced in paragraph numbered 1 of Article I of the Convention.

Each High Contracting Party shall acquire and place at the disposition of the Commission any land within its territory required for the construction and maintenance of hatcheries, rearing ponds, and other such facilities as set forth in Article III.

ARTICLE IX

Every national or inhabitant, vessel or boat of the United States of America or of the Dominion of Canada, that engages in sockeye salmon fishing on the High Seas embraced in paragraph numbered 1 of Article I of this Convention, in violation of an order or regulation adopted by the Commission, under the authority of this Convention, may be seized and detained by the duly authorized officers of either High Contracting Party, and when so seized and detained shall be delivered by the said officers, as soon as practicable, to an authorized official of the country to which such person, vessel or boat belongs, at the nearest point to the place of seizure, or elsewhere, as may be agreed upon with the competent authorities. The authorities of the country to which a person, vessel or boat belongs alone shall have jurisdiction to conduct prosecutions for the violation of any order or regulation, adopted by the Commission in respect of fishing for sockeye salmon on the High Seas embraced in paragraph numbered 1 of Article I of this Convention, or of any law or regulation which either High Contracting

Party may have made to carry such order or regulation of the Commission into effect, and to impose penalties for such violations; and the witnesses and proofs necessary for such prosecutions, so far as such witnesses or proofs are under the control of the other High Contracting Party, shall be furnished with all reasonable promptitude to the authorities having jurisdiction to conduct the prosecutions.

ARTICLE X

The High Contracting Parties agree to enact and enforce such legislation as may be necessary to make effective the provisions of this Convention and the orders and regulations adopted by the Commission under the authority thereof, with appropriate penalties for violations.

ARTICLE XI

The present Convention shall be ratified by the President of the United States of America, by and with the advice and consent of the Senate thereof, and by His Majesty in accordance with constitutional practice, and it shall become effective upon the date of the exchange of ratifications which shall take place at Washington as soon as possible and shall continue in force for a period of sixteen years, and thereafter until one year from the day on which either of the High Contracting Parties shall give notice to the other of its desire to terminate it.

In witness whereof, the respective plenipotentiaries have signed the present Convention, and have affixed their seals thereto.

Done in duplicate at Washington on the twenty-sixth day of May, one thousand nine hundred and thirty.

[SEAL] HENRY L. STIMSON

[SEAL] VINCENT MASSEY

PROTOCOL OF EXCHANGE

The undersigned the Secretary of State of the United States of America and the Canadian Minister at Washington met this day for the purpose of exchanging ratifications of the Convention between the United States of America and Canada for the protection, preservation and extension of the sockeye salmon fisheries of the Fraser River System, signed at Washington on May 26, 1930.

The Secretary of State of the United States of America stated that the Convention is ratified on the part of the United States of America subject to the three understandings contained in the resolution of the Senate of the United States of America advising and consenting to ratification, a copy of which resolution was communicated to the Secretary of State for External Affairs of Canada by the Minister of the United States of America at Ottawa in his note of July 7, 1936. These three understandings are as follows:

(1) That the International Pacific Salmon Fisheries Commission shall have no power to authorize any type of fishing gear contrary to the laws of the State of Washington or the Dominion of Canada;

(2) That the Commission shall not promulgate or enforce regulations until the scientific investigations provided for in the Convention have been made, covering two cycles of sockeye salmon runs, or eight years; and

(3) That the Commission shall set up an Advisory Committee composed of five persons from each country who shall be representatives of the various branches of the industry (purse seine, gill net, troll, sport fishing, and one other), which Advisory Committee shall be invited to all non-executive meetings of the Commission and shall be given full opportunity to examine and to be heard on all proposed orders, regulations or recommendations.

The Canadian Minister stated that he was authorized by his Government to state that it accepted the foregoing understandings.

The exchange then took place in the usual manner.

IN WITNESS WHEREOF, they have signed the present protocol and have affixed their seals hereto.

Done at Washington this twenty-eighth day of July, 1937.

CORDELL HULL [SEAL]
Secretary of State
of the United States of America

HERBERT M. MARLER [SEAL]
Canadian Minister

APPENDIX B

REPORT ON THE INVESTIGATIONS OF THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION ON THE FRASER RIVER SOCKEYE FOR THE YEAR 1938

By W. F. THOMPSON, *Director*

During the season of 1938, the first since the organization of the Commission, as good a start on the investigation of the sockeye fishery was made as was feasible with the small initial appropriations available. The work was of an experimental and preliminary nature, to establish facts upon which the permanent program could be based. The present report should not be considered as defining the latter, but as describing the steps which were taken to explore the possible and necessary investigations. It embodies as much as possible of the program discussed with the Advisory Committee and the Scientific Council, and approved by the Commission.

The Commission found that it must act to preserve and rehabilitate the sockeye salmon in the following ways, as applied to each of the distinct "races" or "runs" of salmon, which are so unevenly depleted in the Fraser. Each such "race" migrates as adults usually in their fourth year from the ocean to distances as great as a thousand miles up the Fraser, to a spawning ground which it is believed is the particular home of that race; and its young return as yearlings to the sea. The courses of action open to the Commission in its efforts to increase the numbers at these various stages may be outlined roughly in accord with the resultant stages of life.

(a) Prevention of overfishing while the fish of each race is in the commercial fishery, in salt water or the lower river. To do this the time and place of migration of each race as it is affected by each section of the fishery, must be known; a system of statistical information as to the fishery, its gear, and its habits, must be devised; and personnel must be trained to collect statistics when they are needed for the formulation and application of regulations. Foremost among the necessities is an accurate system of estimating the runs and the numbers which escape to the spawning grounds of each race.

(b) Discovery and removal of obstructions, to facilitate the ascent of mature fish, to open new areas for reproduction, and to safeguard the descent of the young to the sea. This requires a survey of the river, of possible dams and fishways, and of the migrating habits of the fish itself.

(c) Assisting and protecting propagation. The spawning grounds and the streams leading from and to them must be protected from injury by logging,

dredging, pollution, or changes in water flow. Spawning may be assisted by methods of artificial propagation or stream improvement. Mortality during the early stages may be lessened by destruction or control of predatory fish. There is required a survey of the river at the time of spawning, a study of the Indians and their fishery, and of the habits of the sockeye and of fishes or other organisms affecting its survival. The young sockeye emerge from the gravel of the spawning ground, and migrate to lakes or other deep water, where it may or may not be possible to assist their survival. Means of counting or estimating the number of mature fish, of the fry and of the yearlings produced must be devised to guide action in their behalf.

To explore the possible means of attaining these ends the following specific activities were undertaken during the year 1938:

1. Employment of a field party to tag salmon in the commercial traps at the entrance to the Strait of Juan de Fuca. Under special permit the owners were compensated for the fish tagged by allowing the traps to take an equivalent number during the weekly closed seasons, under the supervision of the Canadian Department of Fisheries. A thousand fish were tagged on two-day visits of two men at weekly intervals. The recoveries, taken in much greater numbers than in any preceding experiment, formed a very high percentage, 432 fish being recovered from 980 sockeye tagged. The returns illustrated the type of facts which such experiments would bring to light. Of about 130 taken and tagged prior to July 2, some 37 in number were recovered, all from runs to the west coast of Vancouver Island and from there only. More would have been returned from there had the waters of Nitinat Lake not been closed July 1. Of subsequently tagged fish, 323 were recovered from the commercial fishery enroute to the Fraser. From the Indian fishery of various localities on the Fraser, 30. From the spawning grounds at Little and Adams Rivers and vicinity, 31, after a time enroute of somewhat over two months.

This in itself does not give an accurate picture of the relative numbers escaping to the spawning ground, as a correction must be applied for tags not recovered there, but the results may form a basis for a determination of this kind when analyzed. The returns give a view of the time a race, such as that of Adams River, was in the commercial fishery, enroute to that river, and on its spawning grounds. They show that the catches of these traps and those taken elsewhere in Juan de Fuca Strait as well as from Swiftsure Bank must be studied by tagging to discover the destination of their fish. A certain percentage are bound for the Skagit, Nitinat, and other rivers. The results were all that could have been hoped for from such a small experiment, and with additional work in successive cycle runs should give some of the data necessary for regulation.

(2) Charter of a vessel for two months to develop methods of capture and tagging of migrating adult sockeye salmon before their entry to the Fraser River. While the vessel should have operated during the whole season, funds would not permit. But by the one month's operation during the run it was proved possible to take sockeye in good condition for tagging at the mouth of the Fraser, 2587 being tagged at a cost of approximately $900. Recoveries totalled 48 per cent. At Adams River and vicinity 358 were retaken. This was

an unprecedented and most successful recovery of tags from spawning grounds, due to the methods used. Detailed presentation of conclusions must await special reports. But, as was the case with the tagging in commercial traps, it is plain that the returns show the effect of special closed seasons, the prolonged period of milling around the mouth of the Fraser, the intensity of the fishery, the proportions taken by different types of gear, the time of migration past various places in the river, and the time taken before recovery on the spawning grounds. Also, certain conclusions were possible regarding the proportion of the run taken by the commercial fishery.

It is plain that future work of this character, absolutely necessary as it is for any regulation, must cover a full season of operation.

3. Employment of a field party of two to tag sockeye above fishing limits, principally at a site in the Fraser Canyon just below Hell's Gate. Of 2128 tagged, 652 were recovered, about 30 per cent, a very high percentage considering that the recoveries were from Indians and from spawning grounds. The greater number were from Adams and Little Rivers. Approximately a month elapsed before tags were recovered on the spawning grounds whether in the Adams River to the south or in the Nechako to the north. The time of passage of various races through Hell's Gate was shown. It was apparent that tagging did not commence in time to catch any of the early runs to Stuart Lake, etc., nor continue long enough to tag late runs. An interesting phase of this experiment was that the recoveries by the party, of tags placed by themselves, show the delays to which the sockeye are subjected by the currents in Hell's Gate. This may provide a means of studying the effect of obstruction.

Here again provision must be made to tag during early and late runs past Hell's Gate, which could not be done this year.

4. Payment of rewards for tags returned after recapture by fishermen and Indians, requiring development of an organization for recovery and publicity. On the efficiency of this depended the success of the field work, described above. Of a total of 5695 fish tagged, 2295 were recovered, about 40 per cent.

5. Employment of four observers at the canneries in Steveston, Friday Harbor, Bellingham, and Anacortes to (a) recover tagged fish, (b) take representative samples of fish for a study of the characteristics of the various races of sockeye, (c) recover "marked" sockeye returning from an experiment conducted at Cultus Lake in 1936 by the Fisheries Research Board, (d) establish a basis for a statistical system.

These observers examined 791,235 fish, slightly over 50 per cent of all the sockeye (1,448,384) taken in the region. They took details of age, size, sex, etc., of about 10,000 of these. Of all fish examined 0.63 of one per cent had the clipped fin markings placed on them at Cultus Lake. The great mass of data has not been analyzed, due to the fact that the staff available after the end of the runs in November was not sufficient.

6. Employment of six men for periods of 3 to 5 months in the upper river spawning areas to survey the important streams and to count or estimate the number of spawners returned to each. The Fraser River basin is approximately

90,000 square miles in area. The section covered by each man was large, there being one each to the Stuart Lake, Nechako, Quesnel, Chilco, Thompson River, and Harrison-Seton Lake district. These men mapped the spawning grounds, observed obstacles, stream conditions, reported on the runs occurring and the conditions affecting them, and collected data (scales, measurements, etc.), which would aid in distinction of the several races. Summaries and maps have been prepared for each district and for the Fraser as a whole. Four years, or a complete cycle, should be collected before conclusions should be drawn.

The field parties examined fish from every part of the upper Fraser for sockeye from Cultus Lake which had been marked when young by clipping the fins. None were found elsewhere than at Cultus Lake, to this extent supporting the "home stream" theory. The numbers there marked formed a very low percentage of the fish in the Fraser, and occasional strays might well have been overlooked. Unfortunately, no field party was available for certain sections of the lower Fraser where recoveries might have occurred.

This was a serious lack. No field parties were available for a survey of spawning grounds on the lower Fraser, and as a consequence it received only such attention as one or the other members of the staff could give it. This must be remedied the coming year, as these grounds are at present the most important on the Fraser.

In November, however, the heavy run at Adams River was closely studied by a field party, composed of staff members from those sections of the Fraser where the work was over.

7. Employment of personnel during other than the period of the run of fish, to compile, analyze, and report upon the data from other than Commission sources but already available regarding both salt water fisheries and the Fraser River runs of sockeye past and present. Exceedingly valuable records have been accumulated through the years by the Canadian Department of Fisheries. These have been made accessible to the Commission through the kindness of Chief Inspector of Fisheries, J. A. Motherwell, and the Supervisor of Fisheries for the district including the Fraser, Mr. R. W. MacLeod. Other records have been made available through the various Provincial and Dominion departments having to do with mining, geological survey, aerial mapping, water rights, forestry and Indians.

From this material, intensive studies of the individual spawning grounds have been begun, with interesting results as to cycles of heavy spawning, changes in these cycles, etc. Great amounts of very valuable data have been collected.

8. Conduct of an experiment at Cultus Lake, using the weir now there, for study of methods of enumerating the spawners present on the beds.

Early in the work of the Commission it was realized that no good method of determining the numbers reaching the various tributaries existed, and that in many important races the greater part of the spawning run escaped observation so that it was not even known where or in what numbers it spawned. To develop a means of tracing and enumerating these fish became of prime importance to any action of the Commission designed to increase them.

The method tried is simple and direct. The adult migrants lifted over the weir were 13,000 in number. Of these a third were tagged. The ratio of tagged to untagged thus established reappeared wherever the spawners could be observed, even though in small number. It was shown that if the number entering was unknown, but the number tagged was known, and if the ratio was ascertained from even a small fraction of the run, dead or alive, the total number of migrants could be determined. This was true even when the ratio was reduced to 3 in 100.

The method will be of great use in determining the numbers of fish present on a spawning ground even when they cannot be seen. By suitable planning of the experiment, the sections of the grounds can probably be studied separately, thus determining the distribution of the spawners in the various sections. The magnitude, time of occurrence, and success of the runs may not be the same in the observed and unobserved sections, so that ideas obtained from studies made by present means of visual observation may be in error.

It is proposed to extend the new method, if it proves successful, to the different tributaries of the Fraser in succession, in order that the size of the run to each may be more completely known than at present, and in order that the relative importance of lake spawning can be ascertained. An example is the Harrison-Lillooet-Birkenhead system, within which it is not known what fraction of the run spawns in the lakes or other deep waters, and what fraction can actually be counted on the known spawning grounds. It is proposed to begin a development of the method in this tributary during the coming season of 1939, as a logical sequence to the successful Cultus Lake experiment.

A practicable method of this kind is a vital necessity in estimating the effects of regulations in allowing escapement of fish past the commercial fishery.

9. Employment of two of the staff, during time not otherwise used, in continuing capture of predators in Cultus Lake, and in counting the resultant downstream migrants.

It is hoped that by continuing this experiment, carried on since 1924 by the Research Board of Canada, that further light will be thrown upon factors affecting mortality of the early lake dwelling stages, and upon the later reactions of the lake to measures of control. No report is at present available on this year's work, as the downstream migration was barely under way when this was written.

10. Analysis of results obtained during the above projects. Unfortunately, a sufficient staff could not be retained after the end of the salmon run to carry out the needed analyses.

It is evident, however, that the surveys of the commercial fishery, of the river and of the spawning have been well begun and will give the Commission the information sought as to the runs, their time and place. The tagging program has been successful in indicating the runs of this year, as far as it is possible to apply the tags. If continued on a more complete scale during the coming four years, one complete cycle will have been analyzed. It is evident that new methods of estimating the numbers of migrants may be available. The basis has been laid for a historical and statistical treatment of these runs.

During the year now beginning (1939), these projects must therefore be continued. They must be extended over the season of the run. They must be repeated in perfected form in successive years of the life cycles of the annual runs until each is properly known. Tagging, vessel operation, surveys, studies of races, and observations of spawning have been initiated and the funds required to carry them on have been determined. Present indications are that at least some of these things can be properly handled this year for the first time. As for the rest, the accomplishment of the duty of the Commission must simply be delayed an additional year.

There must, however, be other things begun at once, as shown by this year's results. Among these the following deserve note:

(a) A study of the occurrence of the "races" of fish in treaty waters, including those of other than Fraser River origin. As already noted, the tagging, scale samples, etc., collected at Sooke have indicated a considerable mixture of fish from other rivers. It is expected that this will be true in greater measure of the runs on Swiftsure Bank. It will be necessary to detail members of the scientific staff to pay special attention to this problem.

(b) Collection of statistics on the commercial catches, in the light of the findings of the past year as to races, etc. Without these, regulation, when it is undertaken by the Commission, will be hampered by a lack of knowledge as to what the fishery actually is and does, as shown by experience over at least two full cycles, or eight years.

(c) A detailed biological and engineering study of the obstacles to ascent of adult salmon, as brought out by the last year's survey, looking to definite action by the Commission for their removal. This was well begun by the tagging experiment at Hell's Gate.

(d) The perfection and application of methods of estimating the numbers reaching the spawning ground, with determination of traps, weirs, fences, etc., which may be necessary. The intention to do this first on the Harrison system has been discussed above.

(e) A beginning of the study of the first year of life of the salmon in various parts of the Fraser, to discover among many other things, such factors as cause mortality, the spawning habits, and the relationship of each spawning ground to the lakes or other bodies of water in which the yearlings live prior to their downstream migration.

A basis must be laid for the possible employment on the young downstream migrants of marking experiments, such as fin clipping, to supplement the tagging experiments carried on this year. Such methods cannot be used on stocks of fish in a precarious condition unless it is known what mortality they cause, since this has been stated to be high. Many other things must be known before such marking can be effectively used. In advance of exploratory work it is not possible to foresee and estimate either the problems or the results which will be met with in this phase of the investigation.

(f) The first direct steps toward application of measures to assist propagation, whether through hatcheries, control of competitors for food, or predators, or protection from physical changes must be made as soon as the studies now under way as outlined above, indicate the possibility. This may be the present year, or at any time thereafter.

(g) A study of the productive and non-productive waters of the watershed to determine the cause of their failure or success, or their decline in productivity.

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