SOCKEYE SALMON FISHERIES

Exchange of notes at Washington July 21 and August 5, 1944, with letter and memorandum of International Pacific Salmon Fisheries Commission dated January 11, 1944, list of remedial works recommended, and Canadian Order in Council
Entered into force August 5, 1944

59 Stat. 1614; Executive Agreement Series 479

The Canadian Chargé d'Affaires to the Secretary of State

CANADIAN EMBASSY
AMBASSADE DU CANADA

WASHINGTON, D.C.
July 21, 1944

No. 266

SIR,

I have the honour to refer to the Convention between Canada and the United States for the Protection, Preservation and Extension of the Sockeye Salmon Fisheries in the Fraser River System, signed at Washington on May 26, 1930.[1]

2. Under Article III of the Convention, the International Pacific Salmon Fisheries Commission is required to "make a thorough investigation into the natural history of the Fraser River sockeye salmon, into hatchery methods, spawning ground conditions and other related matters". The Commission may also recommend to the two Governments "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".

3. As a result of extensive investigation the Commission recommended to the two Governments on January 11, 1944, remedial measures for overcoming obstructions to the ascent of the salmon in Hell's Gate Canyon and further investigation and remedial measures for overcoming obstructions to the ascent of the salmon elsewhere in the Fraser River watershed. It was estimated that the cost of the works recommended would be $2,000,000, which, in accordance with Article III, paragraph 2, of the Convention, would be shared equally between the two Governments. One copy of the letter and

[1] TS 918, *ante*, p. 41.

memorandum from the Commission under date of January 11, signed by the chairman and secretary are attached hereto as appendix A. Also attached as appendix B is one copy of a list of the remedial works recommended by the Commission.

4. The Canadian Government has approved of these recommendations of the Commission as set forth in its letter and report of January 11. A vote of $1,000,000 to provide for Canada's share of the costs of these works has been recommended to Parliament. The Commission has also been authorized by Order in Council P. C. 5002 of June 30, 1944, to let contracts for the remedial works recommended. One copy of Order in Council P. C. 5002, marked appendix C, is attached hereto.

5. The regular procedure for the payment of expenses properly incurred by the Commission is that such expenses are paid by the Canadian Government, one-half being recoverable later by Canada from the United States. This procedure was agreed to by the United States by your note of December 10, 1937. It is acceptable to the Canadian Government that this procedure should be followed with respect to expenditures incurred by the Commission for the proposed remedial works.

6. It would appear desirable that the recommendations of the Commission as set forth in its letter and report of January 11, 1944 and the arrangements proposed for implementing these recommendations should be formally approved by Exchange of Notes between the two Governments.

7. If these proposals are acceptable to the Government of the United States, this note and your reply thereto accepting the proposals shall be regarded as placing on record the agreement of the two governments concerning this matter.

Accept, Sir, the renewed assurance of my highest consideration.

L. B. PEARSON
Chargé d'Affaires

The Honourable CORDELL HULL,
Secretary of State of the United States,
Washington, D.C.

APPENDIX A

COPY

January 11th, 1944

SIR,

In the Pacific Northwest a particularly valuable species of salmon, known as Sockeye, was once so abundant that in 1913 it produced a pack of almost a quarter of a billion one pound cans which, at present prices, would be

worth over forty million dollars. Now, one-eighth of that amount is considered a good pack.

The blasting of rocks during railroad construction in a narrow gorge of the Fraser River known as Hell's Gate Canyon, is charged with causing this huge decline by obstructing passage of the fish to their up-river spawning grounds. It is now believed, however, that great numbers of fish were fatally retarded at this canyon even under natural conditions.

Canada and the United States created this Commission to rehabilitate this once enormous food supply of the two nations—for though the spawning all takes place in Canada, United States fishermen get first chance to catch the fish as they pass through Puget Sound to approach the Fraser River mouth.

After intensive investigation it has been conclusively shown that the terrific rush and surge of water at Hell's Gate Canyon is largely responsible for failure of the salmon run to recover its former magnitude. Furthermore, the Commission finds that construction of so-called fish-ladders at this point will largely eliminate the difficulty. Some lesser obstructions also should be eliminated.

The Treaty requires the Commission to recommend to the two Governments the removal of obstructions. Accordingly the Commission herewith submits a biological report showing the necessity for action, an engineering report showing the action required, and a request for two million dollars with which to accomplish the desired result.

Respectfully submitted,

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

By EDWARD W. ALLEN
Chairman
A. J. WHITMORE
Secretary

Honourable ERNEST BERTRAND, K.C.,P.C.,
Minister of Fisheries,
Ottawa.

RECOMMENDATION OF INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION FOR OVERCOMING OBSTRUCTIONS TO THE ASCENT OF SOCKEYE SALMON, PURSUANT TO TERMS OF A TREATY BETWEEN CANADA AND THE UNITED STATES

The International Pacific Salmon Fisheries Commission was created for the purpose of rehabilitating a Pacific Coast salmon run known as the sockeye salmon of the Fraser River. In its largest year this run produced almost a quarter of a billion pounds of finest quality canned salmon which at present

prices would have a value of more than forty million dollars. An eighth of that amount is now considered a good pack.

Among causes suggested for this great decline were need for international regulation and damage to the runs by blasting of rocks and by rock slides during railroad construction in the narrow gorge of the Fraser River, up which the fish must ascend to reach their spawning grounds. The first function of the Commission was to determine what were the actual causes, next to suggest remedies, and after eight years to regulate the catch.

Sockeye salmon normally spawn in late summer or fall in gravel beds in streams which are near lakes, or in the lakes themselves in the upper Fraser River drainage area, some 90,000 square miles in extent. The eggs hatch in early spring, and the young usually spend a year in lakes, then go down to sea and when four years old return to the very stream in which they were born, then in turn to spawn and die. The production of each stream therefore depends upon the run to that stream four years before. In a big river system like the Fraser with its numerous feeder streams there are therefore many separate runs each year. These may occur at different times during a season, though in fact there is much overlapping of such runs.

If the salmon had to keep on their way upstream or die and a run lasted only 30 days and there was a period of 30 days right at the time of such run when the fish could not pass up the river, the conclusion would be natural that such run would not reproduce itself. The problem is not that simple. However, the Commission did find that salmon could only stand a limited delay and that if the delay exceeded such limit they dropped downstream and were lost for reproductive purposes.

The Commission further found that there were specific levels of the river during which the salmon were unable to get up through the terrific rush of water at Hell's Gate Canyon and that these impassable levels occurred during the salmon season, but varied greatly in time, length, and seriousness from year to year. In some years practically all the runs which had survived to that year got through. In other years the entire season was nearly impassable (in 1941 it is estimated that one million fish were unable to ascend the Canyon, dropped down below and died). In some years certain runs were affected; others were not.

It was also found that, although Hell's Gate Canyon was by far the most serious obstruction of this character, there were other places in the river system, each of which took its toll. Some forty such obstructions were specifically noted, of greatly varying importance, but a much more thorough survey of the seriousness of each, and of conditions at other points where difficulty may exist than the Commission has thus far been able to make, is essential. Moreover, the Commission found large areas apparently suitable to salmon spawning which never had been utilized because of some natural obstruction, and that it was probable that an adequate survey and proper remedial action

would be the means of opening up such areas, thereby increasing the productivity of the system beyond what it had ever been.

A most important consideration is that a depleted run of sockeye salmon if given a reasonable opportunity recuperates rapidly. There are, however, great areas to which the runs of certain years have been completely destroyed. Such areas require distinctive treatment. Moreover, any measure of redress, in order to be effective, will require the aid of regulation of the catch.

Viewing the entire field, the Commission found that it would be uneconomical and unsound, if not wholly futile, to attempt to resort to any recuperative or regulatory measure if the same might in any year be rendered fruitless by reason of the restored runs being again depleted by being obstructed in their attempted passage up Hell's Gate Canyon or other points of difficulty.

Accordingly, it is essential that as a first step in an orderly rehabilitation of the sockeye salmon of the Fraser River system as a whole that this continuous threat of destruction at Hell's Gate Canyon be removed. After that, many runs will promptly proceed to restore themselves and this natural process can be going on while the Commission effectuates its plan to bring back lost runs as well as those so close to extinction as to require artificial stimulation, and to produce runs into new areas. Gradual removal of minor obstructions can also be carried on concurrently, as biological and engineering studies indicate the corrective action necessary.

These facts and conclusions are the result of six years of intensive investigation of every available source of information from official and commercial records and from one of the largest fish tagging experiments ever conducted, many thousands of fish having been tagged in salt water and at different parts of the river with observable celluloid tags these then having been collected by means of rewards and otherwise, also by the use of trained observers systematically stationed throughout the area.

Submitted herewith is a biological report from the Commission's scientific staff which presents a remarkable record of investigation and analysis. Dr. W. F. Thompson, until he came to this Commission, had been Scientific Director of the International Fisheries Commission (Halibut) and was largely responsible for the accomplishments of that Commission which have justly won world-wide recognition. He is now the Scientific Consultant for this Commission.

When the Commission became convinced that a basic difficulty in rehabilitating the Fraser sockeye salmon run lay at Hell's Gate Canyon, it not only concentrated its biological work to bear upon that point but also engaged the most experienced fishery engineers available. Milo Bell, the Commission's chief engineer, is the only active engineer in either nation who has specialized in fishery conservation devices directly related to Pacific salmon. And he in turn has had the assistance of Professor Charles W. Harris, an outstanding hydraulic engineer, as consultant.

So-called fish-ladders have been in use for many years as a means of enabling fish to ascend rivers blocked by dams and natural obstructions. The greatest installation heretofore made was at the Bonneville Dam on the lower Columbia River. The fishery devices at the Bonneville are said to have cost approximately $7,000,000.00. Nevertheless, these fully justified the expenditure for they have successfully demonstrated their effectiveness in passing the well known Chinook salmon up the Columbia. The practical use of fish-ladders is therefore well recognized in the engineering field.

In the engineering report submitted herewith, the use of fish-ladders to obviate the Hell's Gate Canyon obstruction is presented. But although the Fraser salmon run substantially exceeds that of the Columbia both in quantity and value, the cost of the proposed fish-ladders at Hell's Gate Canyon, together with the estimated cost of investigating and overcoming other obstructions and incidental remedial proposals, all together is less than one-third of the cost of the work at Bonneville.

The Commission therefore requests a total appropriation of $2,000,000, one-half from Canada, one-half from the United States, for the purposes above outlined. One good year's run restored should produce a catch ten times the entire proposed investment. And under continued and adequate regulation and protection, this enormous food resource should become recurrent year after year in perpetuity.

Respectfully submitted,

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION
By EDWARD W. ALLEN
Chairman
A. J. WHITMORE
Secretary

January 11th, 1944

APPENDIX B

OBSTRUCTIONS ON THE FRASER RIVER WATERSHED, THE INVESTIGATION AND IMPROVEMENT OF WHICH IS RECOMMENDED BY THE INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

	Stream	Name of obstruction and location	Description and importance	Remedial measures
1.	Fraser River	Hell's Gate Canyon	Impassable obstruction at certain water levels. Principal spawning grounds of the Fraser system are controlled largely by conditions at this point:	Construction of permanent fish-ways on each bank at point of obstruction.

Stream	Name of obstruction and location	Description and importance	Remedial measures
2. Fraser River	Bridge River Rapids. 6 miles above Lillooet.	Two rapids 900 ft. apart. Both serious obstructions to salmon migration below 20 ft. level.* Over ¾ of available spawning area above this point. Formerly bulk of escapement spawned above this obstruction.	Construct fish-ways and improve channel for each rapids on both banks of river.
3. Lillooet River	Skookumchuck Rapids. 18 miles above Harrison Lake.	Rapids in constricted, canyon-bound channel. Records of sockeye delayed from 1 to 21 days. Blockade forms above 1 ft. level on gauge. Commonly inflicts heavy mortality on important Birkenhead run.	Install fish-way on left bank and alter channel. Include 10 ft. maximum water fluctuations.
4. Chilcotin River	Farwell Canyon. 11 miles from mouth.	Constricted, bed-rock channel with fall of 4 to 6 ft. at obstruction. Blockade above 3 ft. level on gauge. Over 15% of Chilko run** normally lost at this obstacle.	Construct fish-way on left bank. Blast cut in rock on right bank. Cover 6 ft. maximum water fluctuations.
5. Chilko River	Keighley Holes. 7 miles above confluence of Chilcotin River.	Channel between high dirt banks. Large boulders in bed cause fall of 5 ft. at obstruction. Chilko run** delayed at all common water levels.	Remove boulders and rock debris from channel. Construct baffles on right bank to reduce velocity of flow.
6. Quesnel River	Rapids. 4 miles below Likely.	Obstruction caused by tailings from Boullion mine. Present channel is constricted by dumped rock so that velocity of flow is too great for normal passage of salmon.	Remove rock debris from channel and restore original conditions.
7. Stellako River	Falls. 4 miles above Fraser Lake.	At 3 ft. falls located in spawning area is ascended with difficulty. Elimination of obstruction would encourage extension of spawning area to desirable streams above.	Reduce flow in channel.
8. Bowron River	Gravel bars, mouth of Bowron River.	At low water stages there is not sufficient water on gravel bars to allow salmon to ascend.	Dredge one main channel for entire flow of river.

*Hell's Gate gauge.
**Chilko run composes over 80% total escapement, 1940–1941:

Stream	Name of obstruction and location	Description and importance	Remedial measures
9. Morris Creek	Shallow channel. Mouth of Morris Creek.	Similar to above. At low water channel nearly dry caused by seepage near mouth. Run commonly delayed two to three weeks before able to enter.	Concentrate flow into one main channel.

Stream	Tributary to	Description	Remedial measures
10. Boise Creek	Upper Pitt River	Excellent sockeye stream with large amount of potential spawning area. Numerous log jams present of which some are impassable to salmon. Serious damage done by floods.	Remove log jams and improve spawning conditions.
11. Douglas Creek	Harrison Lake	Spawning beds scoured by logs and further damaged by floods. Formerly a very important spawning stream.	Remove log jams from channel.
12. Railway Creek	Upper Lillooet River	Beaver dam is located ½ mile above mouth. Good spawning area above dam. Sockeye now limited to lower part of stream.	Transplant beavers to non-salmon stream. Remove dam.
13. McKenzie Creek	Upper Lillooet River	Beaver dam located 20 yards from mouth. Sockeye formerly spawned above dam but now confined to lower part of stream.	Transplant beavers to non-salmon stream and remove dam.
14. Pemberton Creek	One-mile Lake	Numerous log jams which not only block salmon but encourage shifting of channel during high water. Formerly supported run of sockeye.	Remove log jams and reestablish channel in former location.
15. Silver Creek	Fraser River	Place of difficult passage 1–5 miles below lake. Caused by log jams and rapids. Excellent spawning area above.	Remove log jams and improve channel.
16. Nahatlatch River	Fraser River	Large log jam at outlet of lake and numerous log jams on spawning areas that limit areas used by salmon. Extensive spawning area available and formerly produced large run of sockeye.	Remove log jams and general stream improvement.
17. Momich River	Adams Lake	Series of rapids ¾ mile from mouth. Sockeye spawn in lower part of creek.	Install fishpass in channel so that sockeye can ascend to upper regions.

Stream	Tributary to	Description	Remedial measures
18. Scotch Creek	Shuswap Lake	Large log jams near mouth of creek. Channel changes frequently during high water. Only remnant of former large run remains.	Remove log jams and establish channel.
19. Mann Creek	North Thompson River	Beaver dams near mouth which limits present spawning area. Log jams and dense brush in stream ½ mile from mouth. Present depleted run spawn at mouth.	Transplant beaver to non-salmon stream. Remove dam and log jams. Improve spawning area generally.
20. Finn Creek	North Thompson River	Large impassable log jams throughout entire spawning area. Channel frequently changes. Few salmon spawn in creek at present.	Remove log jams and establish channel. Make general stream improvements.
21. Gates Creek	Anderson Lake	Numerous log jams in creek form definite obstruction to migration of salmon. Formerly important spawning area but now runs only spawn near mouth.	Remove log jams and improve spawning area.
22. McKinley Creek	Horsefly River	Log jams in creek prevent salmon ascending lakes above which were used for spawning before 1913.	Remove log jams and improve channel for salmon migration.
23. Nadina River	Francois Lake	One serious log jam and numerous minor ones. Small run of sockeye and spawn in river. Large areas suitable for spawning in upper portion of stream.	Remove log jams and improve spawning area.
24. Forfar Creek	Middle River	Impassable log jams 3 miles above mouth. Good spawning stream and would increase the spawning area available.	Remove log jams.
25. Kynoch Creek	Middle River	Impassable log jams 3 to 4 miles above mouth. Important spawning stream of this district.	Remove log jams.
26. Rossette Creek	Middle River	Log jams and brush block stream ½ mile from mouth. Formerly good spawning creek but only remnant of former run remains.	Remove log jams. and improve stream conditions.

Stream	Tributary to	Description	Remedial measures
27. Narrows Creek	Takla Lake	Numerous log jams cause constant shifting of channel. Formerly excellent spawning stream but now nearly void of fish.	Remove log jams and restore stream to former condition.
28. Pomeroy Creek	Bowron River	Beaver dam at mouth entirely blocks creek to salmon. This stream formerly supported over ⅔ of the Bowron run.	Transplant beaver to non-salmon stream. Remove dam.
29. Indianpoint Creek	Bowron River	Four beaver dams on creek and spawning tributaries. Formerly important spawning and nursery area. No sockeye can enter creek at present.	Transplant beaver to non-salmon stream. Remove all dams and improve stream conditions.

Stream	Location of obstruction	Description	Remedial measures
30. Nicola River	Dam at outlet of Nicola Lake.	The irrigation dam has a poorly designed fishway and an unscreened diversion channel just above the dam. This was formerly good salmon spawning area.	Install satisfactory fishway and revolving screen on diversion channel.
31. Adams River	Dam at outlet of Adams Lake.	The old sluice dam, not in use at present, has an inadequate fishway. The dam is in poor repair and structure is rotten.	Remove dam or install efficient fishways.
32. Louis Creek	Dam on creek for C. N. R. water supply and irrigation.	Fishway in dam closed during salmon run. Salmon drop back into irrigation ditches and die unspawned. Many fry are lost in ditches.	Install revolving screens on diversions and have sufficient water guaranteed during salmon runs for proper operation of fishways.
33. Barriere River	Hydro-electric project located ten miles above mouth.	Dam is 12 to 15 feet high. Fishway is very poor and usually dry during salmon run. This was formerly a good sockeye spawning area. Flume to turbines is unscreened.	Construct new fishpass over dam and screen turbine intake.
34. Lemieux Creek	Low irrigation dam on creek 2 miles above mouth.	Dam is 32 in. high with no fishway installed and during low water is a complete barrier to salmon migration. Unscreened diversion above dam.	Construct fishway in dam and install revolving screen on diversion.

Stream	Location of obstruction	Description	Remedial measures
35. Scotch Creek	Irrigation dam 2¼ miles from mouth.	The 3 foot dam has no fishway and cuts off the former main spawning area. Also has unscreened diversion.	Install fishway and construct revolving screen in diversion.
36. Seton Creek	Hydro-electric and water supply.	Fishway now installed is not satisfactory for passage of salmon. Formerly important spawning area; now nearly depleted.	Construct proper fishway.
37. Conni Lake	Dry channel	Divert Klokkon creek into original channel emptying into Conni Lake. Sockeye formerly spawned in this area.	Divert creek into old channel.

APPENDIX C

P. C. 5002

PRIVY COUNCIL

CANADA

AT THE GOVERNMENT HOUSE AT OTTAWA
FRIDAY, THE 30TH DAY OF JUNE, 1944.
PRESENT:

HIS EXCELLENCY
THE GOVERNOR GENERAL IN COUNCIL:

WHEREAS the Minister of Fisheries reports that the following item appears in the Estimates tabled in Parliament for the fiscal year 1944–45:

Vote 83 To provide for Canadian share of expenses of the International Pacific Salmon Fisheries Commission to overcome obstructions to the ascent of sockeye salmon at Hell's Gate Canyon, and for investigating and overcoming obstructions to such salmon at other points on the Fraser River Watershed---------- $1,000,000

That a similar sum has been provided for the same purpose by the Government of the United States, thus enabling the work to proceed at joint expense;

That persons who, in the opinion of the Minister, may be interested in the work contemplated at Hell's Gate, including the Government of the Province of British Columbia, the Canadian Pacific Railway Company and the Canadian National Railways, have been consulted with reference thereto and that such persons have no objection thereto provided their interests are adequately safeguarded;

That by arrangements between Canada and the United States all expenditures properly incurred by the Commission are paid by the Canadian Government, one-half of such payments to be recovered later by Canada from the United States Government; and

That it is, by reason of the war, necessary for the security, defence, peace, order and welfare of Canada that the Order hereinafter set forth be made.

THEREFORE, His Excellency the Governor General in Council, on the recommendation of the Minister of Fisheries, and under the authority of the War Measures Act, is pleased, hereby, to authorize the International Pacific Salmon Fisheries Commission constituted pursuant to the Fraser River Sockeye Convention, confirmed by chapter ten of the Statutes of Canada, one thousand, nine hundred and thirty, to enter into contracts in the name of His Majesty in right of Canada for the execution of the work at Hell's Gate Canyon and other points on the Fraser River, British Columbia, for which money is, or is to be, provided by the said Vote 83 hereinbefore set out; and is further pleased to authorize and doth hereby authorize the chairman and secretary of the said Commission to execute any such contract on behalf of the Commission.

A. J. P. HEENEY
Clerk of the Privy Council

The Secretary of State to the Canadian Chargé d'Affaires ad interim

DEPARTMENT OF STATE
WASHINGTON
August 5, 1944

SIR:

I have your Embassy's note No. 266 of July 21, 1944, with enclosures, in regard to the recommendation of remedial measures for overcoming obstructions to the ascent of the salmon in Hell's Gate Canyon and further investigation and remedial measures for overcoming obstructions to the ascent of the salmon elsewhere in the Fraser River system, which, pursuant to Article III of the Convention between the United States and Canada for the Protection, Preservation and Extension of the Sockeye Salmon Fisheries in the Fraser River system, signed at Washington on May 26, 1930, was made to the American and Canadian Governments on January 11, 1944 by the International Pacific Salmon Fisheries Commission.

As you point out the estimated cost of the works recommended, which was two million dollars, would in accordance with Article III, paragraph 2 of the Convention, be shared equally between the two governments.

The Government of the United States has approved the recommendation of the Commission as set forth in its letter and report of January 11, 1944, and the accompanying documents including the "General Engineering Re-

port Covering Fraser River Fisheries Projects" and the first Deficiency Appropriation Act, 1944, approved April 1, 1944 (Public Law 279, 78th Congress), contained the following appropriation:

"INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

Restoration of salmon runs Fraser River system: For the share of the United States of expenses incident to the work of improving facilities for sockeye salmon migration in the Fraser River by the International Pacific Salmon Fisheries Commission, under the convention between the United States and Canada, concluded May 26, 1930, including personal services; traveling expenses; rent; purchase, maintenance, repair, and operation of not to exceed four motor-propelled, passenger-carrying vehicles; purchase of furniture, instruments, and equipment; construction of fishways; removal of obstructions and stream improvement; construction of warehouse for storage of equipment; and such other expenses as the Secretary of State may deem proper, to be expended under his direction, $1,000,000, to remain availabe until expended."

The Department observes from paragraph 5 of your note that it is acceptable to the Canadian Government that the regular procedure whereunder expenses properly incurred by the Commission are paid by the Canadian Government, one-half being recoverable later by Canada from the United States, should be followed with respect to expenditures incurred by the Commission for the proposed remedial works. The Government of the United States agrees to this procedure and, subject to the limits of the above-quoted appropriation, will reimburse the Canadian Government for one-half of the joint expenses properly incurred by the Commission in connection with the remedial works in question, the full amount of such expenses having been paid by the Government of Canada, it being understood that in the settlement of such amounts the procedure now observed by the two governments in settling the joint expenses of the Commission will be followed.

Accept, Sir, the renewed assurances of my high consideration,

For the Secretary of State:
G. HOWLAND SHAW

MR. MERCHANT MAHONEY
Chargé d'Affaires ad interim of Canada