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HOUSE OF COMMONS

Second Session—Twenty-second Parliament  
1955

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STANDING COMMITTEE

ON

MARINE AND FISHERIES

*Chairman:* T. G. W. ASHBOURNE, Esq.

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MINUTES OF PROCEEDINGS AND EVIDENCE

No. 1

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BILL 279

An Act to Implement a Convention on Great Lakes Fisheries between  
Canada and the United States

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FRIDAY, MAY 13, 1955

MONDAY, MAY 16, 1955

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WITNESSES:

Dr. A. L. Pritchard, Director, and

Dr. W. M. Sprules, Assistant Director, Conservation and Development  
Service, Department of Fisheries.

EDMOND CLOUTIER, C.M.G., O.A., D.S.P.  
QUEEN'S PRINTER AND CONTROLLER OF STATIONERY  
OTTAWA, 1955

STANDING COMMITTEE  
ON  
MARINE AND FISHERIES

Chairman: T. G. W. Ashbourne, Esq.

Vice-Chairman: A. W. Stuart, Esq.

Messrs:

Anderson	Goode	McDonald ( <i>Parry</i>
Applewhaite	Hardie	<i>Sound-Muskoka</i> )
Arsenault	Harrison	Murphy ( <i>Lambton West</i> )
Ashbourne	Henderson	Nowlan
Barnett	Hodgson	Patterson
Bell	Kirk ( <i>Antigonish-</i>	Pearkes
Bennett ( <i>Grey North</i> )	<i>Guysborough</i> )	Robichaud
Boivin	Kirk ( <i>Shelburne-</i>	Stick
Brisson	<i>Yarmouth-Clare</i> )	Stuart ( <i>Charlotte</i> )
Bryce	MacNaught	Thibault
Cameron ( <i>Nanaimo</i> )	Maltais	Thomas
Cannon	Matheson	Trainor
Ferguson		Weselak

(Quorum—10)

Eric H. Jones,  
Clerk of the Committee.



## ORDERS OF REFERENCE

HOUSE OF COMMONS,  
FRIDAY, February 4, 1955

Resolved,—That the following Members do compose the Standing Committee on Marine and Fisheries:

Messrs:

Anderson	Goode	Matheson
Applewhaite	Hardie	McDonald
Arsenault	Harrison	Nowlan
Ashbourne	Henderson	Patterson
Barnett	Hodgson	Pearkes
Bell	Kirk ( <i>Antigonish-</i>	Robichaud
Bennett ( <i>Grey North</i> )	<i>Guysborough</i> )	Stick
Boivin	Kirk ( <i>Shelburne-</i>	Stuart ( <i>Charlotte</i> )
Brisson	<i>Yarmouth-Clare</i> )	Thibault
Bryce	MacLean	Thomas
Cameron ( <i>Nanaimo</i> )	MacNaught	Trainor
Cannon	Maltais	Weselak—35.
Ferguson		

(Quorum 10)

FRIDAY, February 4, 1955.

That the Standing Committee on Marine and Fisheries be empowered to examine and inquire into all such matters and things as may be referred to them by the House; and to report from time to time their observations and opinions thereon, with power to send for persons, papers and records.

MONDAY, April 25, 1955.

That the following Bill be referred to the said Committee:

Bill No. 279, An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States.

FRIDAY, May 13, 1955.

That the said Committee be empowered to print from day to day, 750 copies in English and 250 copies in French of its Minutes of Proceedings and Evidence and that Standing Order 64 be suspended in relation thereto.

That the said Committee be granted leave to sit while the House is sitting.

That the name of Mr. Murphy (*Lambton West*) be substituted for that of Mr. MacLean on the said Committee.

Leon J. Raymond,  
Clerk of the House.

## STANDING COMMITTEE

## REPORTS TO THE HOUSE

FRIDAY, May 13, 1955.

The Standing Committee on Marine and Fisheries begs leave to present the following as its

## FIRST REPORT

Your Committee recommends:

1. That it be empowered to print, from day to day, 750 copies in English and 250 copies in French of its Minutes of Proceedings and Evidence and that Standing Order 64 be suspended in relation thereto.

2. That it be granted leave to sit while the House is sitting.

All of which is respectfully submitted.

T. G. W. ASHBOURNE,  
*Chairman.*

MONDAY, May 16, 1955.

The Standing Committee on Marine and Fisheries begs leave to present the following as its

## SECOND REPORT

Your Committee has considered Bill No. 279, An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States, and has agreed to report it without amendment.

A copy of the evidence adduced in respect of the said Bill is appended hereto.

All of which is respectfully submitted.

T. G. W. ASHBOURNE,  
*Chairman.*

## MINUTES OF PROCEEDINGS

FRIDAY, May 13, 1955.

The Standing Committee on Marine and Fisheries met at 10.00 o'clock a.m. this day. The Chairman, Mr. T. G. W. Ashbourne, presided.

*Members present:* Messrs, Applewhaite, Ashbourne, Barnett, Bennett (*Grey North*), Bryce, Cameron, (*Nanaimo*), Goode, Kirk (*Shelburne-Yarmouth-Clare*), Matheson, Patterson, Pearkes, Stick, Stuart (*Charlotte*), Thibault and Weselak.

The Chairman thanked the Committee for the honour again conferred on him by his appointment as Chairman. He read the Order of Reference dated February 4, 1955, by which the Committee was constituted, and that of April 25, 1955, which referred to the Committee Bill No. 279, An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States.

On motion of Mr. Applewhaite,

*Resolved*,—That Mr. Stuart (*Charlotte*) be Vice-Chairman of the Committee.

On motion of Mr. Bennett (*Grey North*),

*Resolved*,—That a Sub-Committee on Agenda and Procedure, comprised of the Chairman and 6 Members to be named by him, be appointed.

On motion of Mr. Thibault,

*Resolved*,—That the Committee request leave to sit while the House is sitting.

On motion of Mr. Stuart (*Charlotte*),

*Resolved*,—That the Committee seek permission to print, from day to day, 750 copies in English and 250 copies in French of its Minutes of Proceedings and Evidence.

At 10.15 o'clock a.m., on motion of Mr. Stick, the Committee adjourned until 10.30 o'clock a.m. on Monday, May 16, 1955.

Eric H. Jones,  
Clerk of the Committee.

MONDAY, May 16, 1955.

The Standing Committee on Marine and Fisheries met at 10.30 o'clock a.m. this day. The Chairman, Mr. T. G. W. Ashbourne, presided.

*Members present:* Messrs. Applewhaite, Ashbourne, Barnett, Bryce, Cameron (*Nanaimo*), Goode, Hardie, Hodgson, Kirk (*Antigonish-Guysborough*), MacNaught, Matheson, Murphy (*Lambton West*), Patterson, Pearkes, Stick and Stuart (*Charlotte*).

*In attendance:* The Honourable James Sinclair, Minister of Fisheries, and the following departmental officials: Mr. George R. Clark, Deputy Minister; Dr. A. L. Pritchard, Director, and Dr. W. M. Sprules, Assistant Director, Conservation and Development Service.

The Clerk of the Committee read the Orders of Reference dated May 13, 1955.

The Committee proceeded to consider Bill No. 279, An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States. (*Bill No. 279, which includes the text of the Convention, appears as Appendix "A" to this day's minutes of proceedings and evidence.*)

The Honourable Mr. Sinclair explained the purpose and application of the convention and the bill and answered questions thereon.

The Committee was then shown motion picture entitled The Sea Lamprey. Dr. Pritchard and Dr. Sprules were called, questioned and retired.

Mr. Murphy (*Lambton West*) table five statistical tables compiled by the Department of Fisheries, as follows:

1. CANADA—Catch of Trout in Great Lakes, by Lakes and Total Ontario—1930-1953.
2. CANADA—Catch of Whitefish in Great Lakes, by Lakes and Total Ontario, 1930—1953.
3. Catch of Whitefish in the U.S.A. between 1930-1953.
4. Catch of Lake Trout, 1885-1952—U.S.A.
5. Great Lakes Commercial Fishery Statistics, by Lakes—Quantities and Values—U.S.A., Canada and Totals, 1930—1953.

*Ordered*,—That the said tables be printed as appendices to this day's minutes of proceedings and evidence. (*See Appendices "B", "C", "D", "E", and "F" respectively.*)

The Committee considered Bill No. 279, clause by clause. The several clauses, the schedule, the preamble and the title of the bill were adopted; the bill was carried.

*Ordered*,—That the Chairman report the said bill to the House without amendment.

Pursuant to a resolution of the Committee at its meeting of May 13, 1955, the Chairman then named six members to serve with him on the Sub-Committee on Agenda and Procedure, as follows: Messrs. Applewhaite, Bryce, MacNaught, Murphy (*Lambton West*), Patterson and Stuart (*Charlotte*).

At 12.30 o'clock p.m., the Committee adjourned to the call of the Chair.

Eric H. Jones,  
Clerk of the Committee.

## EVIDENCE

MONDAY, May 16, 1955  
10:30 a.m.

The CHAIRMAN: Order, gentlemen. I see a quorum. I will first ask the clerk of the committee kindly to read the orders of reference.

*(The clerk of the committee read the orders of reference dated Friday, May 13, 1955.)*

The CHAIRMAN: Thank you, Mr. Jones.

I would like to welcome Mr. Murphy of Lambton West who has been substituted for Mr. MacLean as a member of this committee.

We are very glad to have with us this morning the Minister of Fisheries, the Honourable James Sinclair, and I shall now ask him to outline the program to be submitted to the committee.

The Hon. JAMES SINCLAIR (*Minister of Fisheries*): Gentlemen, I am not here as a witness. We have expert witnesses with us today in the persons of Dr. Pritchard and Dr. Sprules who are officials of the department.

As you know the Great Lakes Fisheries have been under the administration of the provincial government of Ontario for some years, and it was in conjunction with that government that we were able to negotiate this international treaty to conserve Great Lakes fish. Since our direct interest in the fisheries themselves, as a federal department, dates only from a year ago, we thought one of the first things we should do would be to compile an authentic study of Great Lakes fisheries.

This study is the work of our department which has turned out this publication which I am holding in my hand and which contains the whole story of Great Lakes fisheries as far as statistics are concerned. This book is not put out by the Queen's Printer. We have a small mimeograph machine in our department and this book is turned out by us. Circulation of our publications is very small, as you may remember from last year's debate on publications in the House. We have however sufficient copies for the members of the committee and they will be circulated.

This will interest members from the province of Ontario particularly, because here is the whole story of Great Lakes fisheries to date. I think the best way to inform you about one or two of the problems of the sea lamprey would be to show you a very excellent film on the lamprey prepared by the United States Fish and Wild Life Service. And when that is over, we actually have lampreys of various sizes here to show you, so that you can actually see the parasites.

As I have said, we have with us Dr. Pritchard and Dr. Sprules of our department. Dr. Sprules is our top expert in fresh water fish and he is here to answer questions.

By the time you have seen the film you will have understood the problem of the lamprey. Both these gentlemen are quite competent to answer any questions you may care to ask them. Thank you.

The CHAIRMAN: Thank you, Mr. Sinclair.

I think for the purpose of the film being shown it would be better for the members to leave their seats at the table and move to the rear of the room in order to get a better view of the screen.

*(At this point a film on the sea lamprey was shown.)*

Upon resuming.

The CHAIRMAN: Gentlemen, I am sure we have all been greatly impressed by the very interesting and most informative motion picture which, in its detail, has given us a good portrait of the damage which is being done to this important fishery in the Great Lakes, and of the great need of trying to stamp out the sea lamprey and destroy it in order to protect the good fish such as the trout and other fish which are found in the lakes, for our fishermen.

I would like to thank Mr. Turner of the Department of Fisheries who brought the film here this morning, and I am sure that having viewed this film we are now in a position to proceed with the bill.

The bill before us today is Bill No. 279 "An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States". (Bill No. 279, which includes the Convention, appears as Appendix "A" to this day's minutes of proceedings and evidence.) Shall clause 1 carry?

1. This Act may be cited as the *Great Lakes Fisheries Convention Act*.

Mr. STUART (*Charlotte*): Mr. Chairman, I would like to ask one question. There is a great demand for eels on the east coast, and the price is always most encouraging to the fishermen. Is there any value in this particular type of eel as a food? Is there any demand for it at all?

The CHAIRMAN: We have with us this morning Mr. G. R. Clark, the Deputy Minister of Fisheries, Dr. A. L. Pritchard and Dr. W. M. Sprules, and they will be glad to answer any questions.

Perhaps in answering Mr. Stuart's question, it might be in order if we heard first from Dr. Pritchard.

Dr. A. L. PRITCHARD (*Director, Conservation and Development Service, Department of Fisheries*): I think it should be explained that the eel to which you refer on the Atlantic coast is not the same as the sea lamprey.

Mr. STUART (*Charlotte*): I realize that.

Dr. PRITCHARD: You know that is what we call a bony fish, while the lamprey is a very simple cartilaginous fish. In the central European countries these are used for food and have been used, of course, in England. But no taste for them has been developed on this continent, although there is a limited market particularly amongst those people who have come from central European countries, and there is a very limited market for them in New York.

The province of Ontario did collect these lampreys and sell them through, particularly, Latvian people. They can be prepared and they are eaten; but we in Canada and the United States have developed no real taste for them.

Mr. APPLEWHAITE: Is that the only area in Canada where lampreys are a menace on a commercial scale?

Dr. PRITCHARD: Actually, the Great Lakes is the only area that we know of. They have become abundant and are really doing great damage.

Mr. HODGSON: They are to be found in a great many of our inland lakes in Ontario.

Dr. PRITCHARD: There are lampreys there, but not these marine lampreys. You see, there are two types of lampreys, even in the Great Lakes, the fresh water species and the marine species. The fresh water species have never reached epidemic proportions, but the marine species, apparently, when it did get in there, has spread to that extent.

Mr. MURPHY (*Lambton West*): Do you happen to have a copy of the chart or the figures which were given to me by Dr. Pritchard? I think they are so important that they should be placed on the record.

Hon. Mr. SINCLAIR: Dr. Sprules has charts to show the effect on the fisheries.

Mr. MURPHY (*Lambton West*): Would you like to call him?

Hon. Mr. SINCLAIR: Surely. He will mount the charts and go through them, and then you will have a better idea.

Dr. W. M. SPRULES (*Assistant Director, Conservation and Development Service, Department of Fisheries*): Mr. Chairman and gentlemen, this graph attempts to portray the change in lake trout production in our Canadian upper Great Lakes from 1920. You have 1920 here moving through to 1953. This is the Lake Huron production which is exclusive of Georgian Bay. I will explain in a moment why we excluded it. The long term average for 20 years is about at this level, something around  $2\frac{1}{4}$  million pounds per annum. That production, with some annual fluctuation here, has suddenly, with the onset of the lamprey which established itself in 1936, fallen right down to nothing, as you can see, from something over 2 million pounds. The Georgian Bay catch was a little lighter,  $1\frac{1}{2}$  million pounds approximately, which ran along well until it finally declined. At the present time there is a residual population of lake trout maintaining itself in Georgian Bay. There is every indication from our records this year that it is now about to decline off the chart also. The Lake Superior Canadian catch which has had a long term average of  $1\frac{1}{2}$  million pounds with fluctuations has continued to maintain itself. Lake Superior, as you will recall from the map, was the farthest point to which the lamprey had to gain access, and we started a program of control with electrical barriers following very much the American procedure. We have put all our effort into Lake Superior in an attempt to maintain the lake trout population, in Lake Superior.

This is a reclamation project now in Lake Huron and also in the American Lake Michigan, but we think we may, if our control is soon enough and good enough, be able to maintain a population in Lake Superior which will give us a source of supply to re-establish lake trout in the Great Lakes.

Mr. MURPHY (*Lambton West*): Have you a copy of the figures given to me by your department?

Dr. SPRULES: Yes.

Mr. MURPHY (*Lambton West*): Would you hand them to the chairman, please, and let the minister see them? It is the small sheet, the figures of the catch of lake trout in the Great Lakes. It shows the catch from 1930 to 1955 in Superior, Huron north channel and Georgian Bay. Would you show that to the chairman and the minister? I think it is so important that it should go on the record.

The CHAIRMAN: Is it agreed—as an appendix?

Agreed.

Mr. MURPHY (*Lambton West*): Now then, Doctor, I happen to live on Lake Huron and that is one reason I am primarily interested in the work of this committee. First, you tell us that the lamprey was noticed in Lake Huron about 1936?

Dr. SPRULES: Yes. Our first authentic record in Lake Huron was 1937 but this does not mean that they were not there before that. It means it is the first specimen a competent scientist obtained there and identified.

Mr. MURPHY (*Lambton West*): I will refer to the figures for the Canadian catch of lake trout in the whole of Lake Huron in your table which I have here. In 1930 it was approximately 2,934,800 pounds, and in 1953 it was practically nothing. Is that right?

Dr. SPRULES: Well, to all intents and purposes.

Mr. MURPHY (*Lambton West*): A mere infinitesimal figure. I just want that on the record to show that something must be done.

Dr. SPRULES: You are speaking of this decline from  $2\frac{1}{2}$  million pounds. It would be of interest to show the similarity in the American production.

Lake Michigan—this scale is larger now; we are up to several million pounds. The long term average in Lake Michigan had been about 6 million pounds through this period and it dropped down within a period of 8 years to nothing and in Lake Michigan now even on the known lake spawning beds they are not able to seine or obtain lake trout in any way. The Lake Huron decline does not seem so precipitous but there was an average of 1.5 million pounds which dropped off again to nothing. Their Lake Superior catch is similar to ours, about 3 million pounds annual production and it has stayed quite constant. We hope in our program we can keep it up there but there is some indication that we may not be able to complete the program until too late, but we shall be able to keep some population I am sure.

Mr. MURPHY (*Lambton West*): While we are on these charts I hope that the committee will agree, perhaps, that we should discuss the other fish also. This chart concerns not only the catch of lake trout but also whitefish in the Great Lakes. The catch of whitefish in the U.S.A. between 1930 and 1953, and the catch of lake trout 1895 to 1952 in the U.S.A.

The CHAIRMAN: I think it would be interesting to have these statistical tables printed as appendices to the record provided it is agreeable to the committee. Is it agreed, gentlemen?

Agreed.

(See Appendices "B", "C", "D" "E" and "F", to this day's minutes of proceedings and evidence.)

Mr. MURPHY (*Lambton West*): Now, Doctor, when you first discovered this lamprey had you any precedent to go on in the way of combating it?

Hon. Mr. SINCLAIR: Our department does not administer the Great Lakes fisheries. It is only in the last year our department has been called in on the matter. The government of Ontario did some work in their research station but the difficulty in co-ordinating work was mainly across the lakes where there are 8 different states each with jurisdiction over fisheries. The official knowledge of Dr. Sprules, our federal Department of Fisheries expert, is fairly recent on it.

Mr. MURPHY (*Lambton West*): As I understand it, the federal department came into the picture only a year ago?

Dr. SPRULES: In 1953.

Mr. MURPHY (*Lambton West*): That is when you made your first survey?

Dr. SPRULES: Yes.

Mr. MURPHY (*Lambton West*): Were you working then in conjunction with the Ontario government and the 8 states? Were you working with them or with the federal governments of the United States of America and Canada on the project?

Dr. SPRULES: On the Canadian side we were working with the province of Ontario and the American program had been co-ordinated under the federal United States Fish and Wild Life Service with the states contributing in a minor way; but everyone was in the picture in our work here. We were only able to work on our own side although individually we did step across the border and discuss matters with the American scientists. There could not be a co-operative program as there was no formal authority for co-operative work internationally.

Mr. MURPHY (*Lambton West*): Is there anyone here who could say what has been done by the Ontario government?

Dr. SPRULES: Yes, sir.



Mr. MURPHY (*Lambton West*): I do not necessarily mean by the Ontario government, but by the local government on the Great Lakes.

Dr. SPRULES: In 1946 the United States of America agencies became very concerned specifically as a result of the decline in Lake Michigan. That was their big fishery and it was all theirs. There is no Canadian fishery on that lake. The U.S.A. Fish and Wild Life Service in the United States were called in to assess the problem in Lake Michigan. At that time they established the Great Lakes Sea Lamprey Committee and they called upon the province of Ontario to sit as a member of that committee in an informal way only to discuss the matter on a scientific level. As a result of the meetings in 1946 it was fully realized that no control program on the American side could be effective *per se*; there must also be control on the Canadian side. Ontario at that time agreed to survey their streams running into Lake Huron. Lamprey still had not become a problem in Lake Superior. The Lake Huron survey was a matter of assessment of the number of streams in which there were sea lamprey spawning runs. On approximately 20 of those streams they built mechanical wire traps across the stream into which the lamprey ran and were removed. They have been carrying on with that sort of weir control on a few streams flowing into Lake Huron since about 1946—I think we had better make that date approximate.

The CHAIRMAN: Mr. Murphy, would you mind passing up all those figures for the record, please?

Mr. MURPHY (*Lambton West*): I would like to use them for a while.

The CHAIRMAN: I see.

Mr. MURPHY (*Lambton West*): Before you finish, Dr. Sprules, would you put on the record the amount of the catch of trout in Lake Huron for three periods—have you got 1954 figures, or even 1953 figures? Then you could go back five years before that, and five years before that again? Or you could take Lake Huron plus Georgian Bay, if you like?

Dr. SPRULES: Would you like the total of Lake Huron and Georgian Bay separately?

Mr. MURPHY (*Lambton West*): I think it would be as well to have them separate.

Dr. SPRULES: There are three statistical units—the area behind Manitoulin Island is also considered a separate entity. I believe the figure shows itself quite clearly if we take Lake Huron as one place.

Mr. MURPHY (*Lambton West*): That will be all right.

Dr. SPRULES: In 1953, production was 344,000 pounds. In 1949, production was 399,000 pounds. In 1944, production was 1,140,000, and in 1939 it was 3,203,000 pounds.

Mr. MURPHY (*Lambton West*): Would you like to go back another five years? Those figures are very impressive. 1939 was the last year you gave.

Dr. SPRULES: In 1934 it was 3,520,000 pounds.

Mr. MURPHY (*Lambton West*): Can you tell us, Dr. Sprules, how many of these contraptions were used by the various local governments in an effort to combat the menace of lampreys up to the time you stepped into the picture?

Dr. SPRULES: I think I made the statement that the province of Ontario operated approximately 20 devices. They were not on the same streams year after year and, incidentally, I do not think that those devices were operated as a control measure. They were operated as an assessment measure to obtain information as to whether there were lampreys running into the streams,

and if so, how many and when. It was a preliminary investigation to find out how these parasites live and what their habits were in this particular lake.

The United States agencies had gathered a lot of information about the creatures on their side, but there we have an entirely different geological picture—sandy shores as against rocky shores on the Canadian side, warm water streams flowing in from a southern drainage system, as opposed to cold water streams flowing in from the north on the other side—and it was necessary to find out what the lamprey were doing and when in our own Ontario drainage system. I do not think the authorities were attempting to control the lampreys at that time, although the devices of which I have spoken would have had the effect of partial control.

Mr. MURPHY (*Lambton West*): From your own experience and from your own observation or knowledge, how many of the streams entering Lake Huron have to be taken care of by way of these weirs, or similar devices in order fully to control the spreading of lampreys or expedite their elimination?

Dr. SPRULES: Our estimate at the present time—and it is a very wild estimate because, as was pointed out earlier, we are working at present on Lake Superior in particular, and we are not assessing the streams in Lake Huron—is that there are approximately 50 streams flowing into Lake Huron which will require attention, and that is a very small percentage of Lake Huron's streams.

Mr. MURPHY (*Lambton West*): I do not understand that. Is there any particular part of the lake which these streams flow into which is considered a vital area?

Dr. SPRULES: The major spawning streams with regard to Lake Huron are in the north channel, on the north shore and behind Manitoulin Island up to Sault Ste. Marie.

Mr. MURPHY (*Lambton West*): That is where these experiments by the department were taking place?

Dr. SPRULES: That is correct. In Lake Superior, if I may refer to that again for a moment, because it is the area where we have more information, we have surveyed every stream flowing into the lake from the Canadian shore and the total is something like 593 streams. Of these 593 streams located in our assessment we feel that at the most 120 will require attention. The other streams have been classified by us as impossible for lampreys to ascend because of natural barriers—falls and so on, or maybe logging dams and other factors. There are other elements such as the lack of suitable spawning areas in a stream—there may be a stream which is entirely unsuitable for lampreys to propagate. But approximately 120 of the 593 streams we surveyed seem to have a high possibility.

Mr. MURPHY (*Lambton West*): I hope you do not mean that you have written Lake Huron off as a source of supply for lake trout, or is it going to be a matter of time before the fishery is restored? I thought I understood you or someone else to say that a lamprey lives for seven years and that trout is its main source of food.

Dr. SPRULES: We are not prepared yet scientifically to say that trout is the main source of food, but it is certainly a desired or preferred source and the trout seem unable to survive the attack. One of the species in the Great Lakes which is very hard-hit by lamprey is the common sucker. Whenever we take suckers in the commercial nets or in our traps there are generally lamprey scars on these fish, but we do not know what is happening to the sucker population because it is not widely fished commercially. We certainly think from experiments that the sucker is much more able to look after itself after an attack than the lake trout. We must keep in mind that the lake trout is very vulnerable to attack.

Mr. MURPHY (*Lambton West*): I think it would be very useful, Dr. Sprules, if you would explain to the committee about the life of the lamprey while in the lake as an adult—is that a one year period?

Hon. Mr. SINCLAIR: Perhaps we should pass some lampreys around. Dr. Sprules has brought some specimens here.

Dr. SPRULES: Yes. We can pass these around. In this small vial are five or six young lampreys. There is one which is an inch long. It is a very young lamprey taken shortly after its emergence from the nest. The egg, as I said, develops into a larva; that larva is unable to swim by itself, and it drifts downstream with the current until it reaches the estuary, where it falls to the bottom, burrows into the mud flats and grows there. It is very small and almost transparent. The mouth protrudes from the surface of the burrow and is turned upstream so that it may catch micro-organisms in the water as they flow down. The creature stays in the mud for four or five years and during that time it grows from about one inch in length, or a little below, to five or six inches long. That takes five years. Then it changes. Metamorphosis occurs like the caterpillar and the moth. It changes into something which really looks like a lamprey. It leaves the burrow and swims actively out into the lake where it attaches itself very quickly to a fish, and after it has been there for just over a year—it reaches the size of the large specimen in the second vial. I think for all intents and purposes we can say the largest specimen in the small vial is approximately five years old; and this animal is just over six years old. Therefore, that is the pattern of growth—it takes five years to reach five inches in length, feeding by itself; and then feeding at the expense of our great lakes fishes, it increases to 18 inches in length in just over a year. At that time it is mature and ready to go back to the stream to spawn and die.

Mr. BRYCE: When it gets hold of the trout, does it continue to hold on without letting go, or does it attack different fish and feed for varying periods of time?

Dr. SPRULES: It does all of the things you mentioned, sir. It will attach itself to one animal, and may stay in that position on the animal until the animal dies, at which time it must of necessity move off and seek another host. Sometimes the lamprey will attach to a fish and for some unknown reason will leave that fish and go off to find another. There seems to be no particular reason for this. As the film illustrated occasionally several lampreys will attack one individual fish.

Mr. STUART (*Charlotte*): In the case of the eel I mentioned on the east coast they have a very bad habit of attacking salmon when they are just about ready to deposit their spawn. They will suck on to the fish and take every bit of spawn out and eat it. Do they have that same problem with the lamprey in the Great Lakes?

Dr. SPRULES: What animal are you speaking of now?

Mr. STUART (*Charlotte*): The eel which we have on the Atlantic coastline. I do not mean to say that it attacks every salmon but they particularly attack the female salmon at the time they are ready to deposit their eggs. I have seen in the traps and the places where the fish go over the dams that the salmon will thrash every which way to try and shake the eel off, but it simply will not shake off until it has devoured every bit of spawn. I wondered if it would be the same thing.

Dr. PRITCHARD: I think we are still a little confused. I believe what you are talking about is a sea lamprey—the true eel does attack and take salmon eggs.

Mr. STUART (*Charlotte*): Do they do the same thing with the trout in the Great Lakes?

Dr. PRITCHARD: I do not think they actually follow them and suck the eggs out. I would be interested in seeing that happen. If they bore right through

the trout as they do quite often, then water gets into the body cavity. Most of you know enough about hatcheries to know that if you let water get into the body cavity the water makes the eggs hard. You cannot fertilize them because the outside of the egg gets hard and they are no good. The fish, of course, will eventually die if you let water get into the body cavities. I can see the point. They do it in a different way, but it has the same effect.

Mr. STUART (*Charlotte*): The reason I asked the question was that I wondered if they had the two destructive ideas of killing the fish and the spawn—because the eels on the east coast do that.

Dr. PRITCHARD: No, actually all they are doing is feeding on the fish. They have no ideas about killing or anything of that nature. They simply have to get food.

Mr. MURPHY (*Lambton West*): I would like to continue for two or three minutes, Doctor. I understand that your activities will be concentrated in Lake Superior and that you will endeavour to keep that situation under control. Is that not one of your first objectives?

Dr. SPRULES: Yes sir. At the present time we feel that is the best place to put our efforts. We must determine through experimentation the best method of controlling this animal and we are using Lake Superior for a testing ground. In this area we are using electrical and mechanical barriers and selective poisons. We may find something else. A new idea we have is ultrasonics. We are testing everything in Lake Superior. Once we have determined the best and most economical method of control then we will be able to move on into other areas and other lakes.

Mr. MURPHY (*Lambton West*): You said a little while ago that there are 50 odd streams of which you know where the lamprey go to spawn in the north channel and Lake Huron area. Perhaps I should not ask this question but why is not an effort being made in this area in conjunction with the Lake Superior effort, since it will require a period of years to destroy this pest? Why do you not start on that project?

The CHAIRMAN: I do not like to interrupt, but I think that is a matter of government policy. Perhaps the minister will speak on it.

Hon. Mr. SINCLAIR: We have been working in this field for only the last two years. This year we have an appropriation of \$330,000 in our estimates whereas there was nothing two years ago on this matter of lamprey control. Our scientists feel that the money should be concentrated first of all in an area where they can at least check the progress of the lamprey. If we concentrate on the Lake Superior area we can hold the line and then move back into Lake Huron, because there it is not a matter of holding the fisheries, it is a matter of exterminating the lamprey and rebuilding the fisheries. We feel that is the best way to spend our money. If the fishing industry of the Great Lakes would speak strongly for a bigger program, I would not be averse to it.

Mr. MURPHY (*Lambton West*): I am speaking strongly now. One reason I had the figures put on the record was that they indicate that this is a serious problem. They indicate that today the catch is less than one-tenth of what it was in 1934. It amounts to a loss of millions of dollars a year, and over a period of ten years it is just ten times that amount. In fact, it is more than that because in Lake Huron we are not getting anything now. I am glad you entered into the discussion and my suggestion is that in view of the fact it has been disclosed that there are only some 50-odd streams where the lamprey go to spawn in Lake Huron—and apparently that includes Georgian Bay and the channel area—that an effort should be made in conjunction with the other effort and that the trout fry—I think that is the term for small trout—be deposited at the lower part of Lake Huron so that the trout industry there could be re-established.

Hon. Mr. SINCLAIR: We want to be very certain, of course, when we ask parliament for more money that such sums will be spent successfully. There is one point.

Mr. MURPHY (*Lambton West*): Before you go into that I think it has been established that the cost of these barriers is a moderate amount, is it not?

Dr. SPRULES: The cost per installation for an electrical barrier varies, of course, dependent on the width of the stream, the conductivity of the water and so on. There are many factors to be considered. One thing that is increasing our costs in Lake Superior is inaccessibility. The road comes up to the Montreal River from Sault Ste. Marie and to Marathon from Fort William, but then we have the great expanse in between with no access roads. The cost per installation is going to run very close to \$10,000 per unit on the average there. As we get into more accessible areas the cost should come down to an average installation cost of perhaps \$5,000 to \$6,000.

Although the film indicated that an electrical barrier would only require 5 or 6 cents worth of electricity per hour, the fact remains that there have to be men there to make sure that the power does not fail, because one day of power failure, or one hour of power failure could be drastic. The cost of maintenance in inaccessible areas is very high.

Mr. MURPHY (*Lambton West*): I am glad you put those figures on the record because if there are only 50-odd streams running into Lake Huron, I can see no objection by anyone to this procedure or enterprise. Did I understand the figures correctly to show that in 1934 there were some 30 million-odd pounds taken?

Dr. SPRULES: No, three million pounds, sir.

Mr. MURPHY (*Lambton West*): Let us put it on a dollars and cents basis. Suppose trout averages 50 cents a pound?

Dr. SPRULES: That is a reasonable estimate.

Mr. MURPHY (*Lambton West*): Take the poundage which you got in 1934, and suppose we take it at a figure of 50 cents a pound?

Dr. SPRULES: Let us say that at today's prices it would be something over \$1 million.

Mr. MURPHY (*Lambton West*): All right; and last year's catch would amount to how much at the same price?

Dr. SPRULES: It was approximately 3 hundred thousand pounds.

Mr. MURPHY (*Lambton West*): That would be \$150,000; so there is really a difference of one million odd per year in the catch of trout alone in Lake Huron; and if the problem is not solved, that would be the annual loss to the fishermen of this country.

Dr. SPRULES: It only applies to that species, because the total fish production in the lake is still pretty favourable.

Hon. Mr. SINCLAIR: That is one point which should have been raised earlier. We have been discussing the damage to lake trout. But the annual figures for the fisheries on the Great Lakes, as far as the total of production is concerned, have been pretty uniform, but the fishing intensity has moved from lake trout to less valuable species. It may be that in making up their catch the fishermen are overfishing these other species. That is why we think it is just as important if not more important, to go ahead with the second phase of this treaty, namely, fisheries research.

We are proud of the job we have done on the two coasts to get proper management or balance in our fishing. In the Great Lakes the pattern of the fisheries catch has changed from what it was fifteen to twenty years ago. The sea lamprey has had its part in it, as well as the demand in the Canadian

market for the better fish such as trout and whitefish. This has provided an incentive for the fishermen to go after these species very intensely. That is why we feel that the program of research which we will join in under this joint commission is just as important as the actual mechanical control of the sea lamprey.

Dr. Sprules and Dr. Pritchard, I think, should say a little about that. From our own experience on the east and west coasts in commercial fishing, practical fisheries management under scientific control is the most important factor; and I think it is reflected in the quite extraordinary record we have in increasing the catch on both of our coasts at a time when many countries have experienced decreasing catches.

Mr. APPLEWHAITE: Is the lamprey doing the same thing as the fishermen, that is, as the lake trout disappears, is it going to transfer its activities to other species?

Hon. Mr. SINCLAIR: Perhaps Dr. Sprules could answer your question.

Dr. SPRULES: Yes. There have been some very interesting changes take place in the Great Lakes populations following the buildup of the lamprey population.

After lake trout have declined to nil, so to speak, the next fish which seems to fall off very rapidly in production is whitefish which is our second most valuable inland species. As the result of the loss of lake trout, other species which were normally the food of lake trout come up in terrific quantities. At the present time in Lake Michigan there is a little white fish known as the chub, which has increased to such numbers in Lake Michigan that commercial fishermen there are hardly able to clear their nets; yet that species has not the same value on the market, certainly not when it is in that quantity.

Mr. APPLEWHAITE: Where is the lamprey going when it cannot find trout?

Dr. SPRULES: On to whitefish or other species. It has even been found on sturgeon and yellow pikeperch. In fact I think that lamprey scars have been recorded on almost every large species in the Great Lakes. It will sustain itself on some of the less important commercial species.

Mr. BARNETT: The question I have in mind may have been already partially answered: whether there is a point of no return to be reached in such a lake as Huron, as far as food supplies for the lamprey are concerned, and whether there is any immediate prospect of a decline in the population of lampreys because of the lack of food?

Dr. SPRULES: We could only speculate. There is no indication that the lamprey run is decreasing in Lake Huron. As a matter of fact, in Georgian Bay where a small lake trout production has maintained itself there has been an increasing number of scars found on the fish taken in the commercial catch. We think the sea lamprey populations are increasing there.

Mr. BARNETT: They are still maintaining themselves in quantity?

Dr. SPRULES: Yes.

Mr. BARNETT: It would appear to me that it was attributable to the program you have been outlining in regard to tackling Lake Superior first and I was wondering whether in the interval while you are dealing with Lake Superior, because of the decline in food supply in the Great Lakes, the problem might be correcting itself in the meantime. That was the thought in my mind and I wondered if it was so.

Dr. SPRULES: No, I do not think that it is so.

Mr. CAMERON (*Nanaimo*): Do lampreys follow somewhat the same life cycle as salmon in going back to the same stream where they were spawned? Do they tend to attach themselves to a certain stream such as salmon do?

Dr. SPRULES: We are not absolutely sure of that. We have tagged a lot of lampreys, but we do not know if they "home" to their original stream.

Mr. APPLEWHAITE: If they are continually moving up from one lake to another, that would indicate that they are looking for new spawning grounds.

Dr. SPRULES: That is true but once established in a stream a large percentage may return to the same stream to spawn. We do not know.

Mr. MURPHY (*Lambton West*): When this convention is adopted by both the Canadian and the American federal governments, what would be the position of the provinces and the states with respect to jurisdiction over fisheries?

Hon. Mr. SINCLAIR: We have no problem at all in this country, because the British North America Act does give sole control over fisheries to the federal government.

Some years ago we made eight of the ten provinces which asked for it, our agents, as far as sport fishing is concerned, and the prairie provinces and Ontario so far as commercial fishing is concerned. The provinces concerned submit the regulations they want to our department. Our scientists pass on these regulations, and they are then made legal by order-in-council. The provinces then administer these regulations as our agents.

It is my feeling that it would be best if all commercial fisheries were under the federal department. Our major fisheries are, of course, the great coastal fisheries, representing over 90 per cent of our total catch. We have the research staff, protective service, engineering staff and fish culture staff, which have done a good job in these great commercial fisheries, and which could easily do the same job in the fresh water commercial fisheries. However that will be a decision for the provinces to make. On the other hand there is no question whatever in my mind that our present arrangement of having the control of sport fishing handled by the provinces is an excellent one, because the provinces are closer to the problem and they can tie in sport fishing with their game laws and tourist attractions, and it works out very well.

When we are criticized for not having taken action on the Great Lakes before this, it must be remembered that this is a matter of provincial jurisdiction, and up until 1953 we were not in the picture at all.

I must say that the province of Ontario has been most co-operative in this program. We have never had trouble over jurisdiction such as they had in the states across the boundary, where states were reluctant to release the necessary authority to their federal government to enter into such a treaty. If it had not been for that, this treaty would have been effected in 1946.

Once congress and parliament have passed the treaty there will be two national governments which will actually control, directly, the program of scientific research and lamprey control. In each of our countries we will keep in close co-operation with the local authorities of the province and the states. In our case it is the province of Ontario, but in the United States it will be the eight states which fringe on the Great Lakes.

Mr. MURPHY (*Lambton West*): Would the commercial fishermen still get their licenses from the states?

Hon. Mr. SINCLAIR: Yes, and the commercial fishermen will continue to get their licenses from the provincial department.

Mr. MURPHY (*Lambton West*): I think I mentioned the other day about sand barges taking out sand at the end of Lake Huron. I suppose according to the British North America Act that would come under property and civil rights, and it would be under provincial jurisdiction.

Hon. Mr. SINCLAIR: Our Fisheries Act does give us pretty broad powers under which we can preserve our fisheries against encroachments such as that.

But because the province now administers control over these commercial fisheries, it is up to them to take the first step. We have authority, however, if there is damage to the fisheries by industrial pollution, or dams, and so on, to require remedial measures.

Mr. MURPHY (*Lambton West*): I would like to hear something about research; but before we go to that, I suppose that after this convention is passed, you will have evidence from fishermen on both sides of the Great Lakes who are interested. The reason I say that is this: this sand removal business would run into millions of tons of sand and gravel a year, and to the fishermen it is important, they maintain—this enormous sand removal interferes with the spawning of the fish in that area. Maybe there is no importance to it, but if there is, and with the current running into St. Clair River, maybe a mile away from where the sand barges take all this gravel and sand, where the fish have spawned near the shore, it would mean that their spawning beds are destroyed before they get a chance to hatch. I think that is vitally important and something which should be inquired into.

Hon. Mr. SINCLAIR: That is a proper field for research for this commission. We shall set up a commission, once the treaty is approved, similar to the other fishery commissions, with Canadian and American commissioners, and there will be an advisory committee composed of operators and fishermen. But as far as primary research is concerned, that will be entirely under the direction of the members of the commission. It may be of interest to have Dr. Sprules and Dr. Pritchard tell us a little about the type of research which we are hoping to do under this commission.

The CHAIRMAN: Before we go on, I might say, Mr. Minister, at our last meeting Mr. Barnett, I believe, suggested that the chairman of the Fisheries Research Board might be asked to attend, but I understand he is in Europe at the moment. I understand that Mr. Otto Young, who is the assistant chairman of the board, might have been available, but he is out of the city at the moment. Dr. Pritchard and Dr. Sprules, I think, will be able to tell you.

Mr. BARNETT: I did not specifically request the chairman of the Fisheries Research Board. I suggested it might be one of those people. I said whoever the department considered to be suitable. But, Mr. Chairman, I have one or two other questions which are somewhat related to the subject matter which we are pursuing.

The CHAIRMAN: I was wondering, before we went on, whether Mr. Murphy had finished, because there are some statistics we want from him for the record if he is finished. Mr. Murphy, have you finished?

Mr. MURPHY (*Lambton West*): Yes.

The CHAIRMAN: Now, Mr. Barnett.

Mr. BARNETT: One of the questions that arises in my mind probably as a result of the film we saw has regard to the species of fish in the Great Lakes which are stream-spawning fish. I noticed there was reference made in the picture to a device for allowing other spawning fish to enter the stream past the barrier; and I was wondering what species were involved, and how important a factor in trapping the lamprey is the provisions of facilities for other species to go on up the stream to spawn.

Dr. SPRULES: At the present time we are including by-pass traps for other species at all our installations. Some species which are important in Lake Superior are running at the same time as the lamprey—I think that something which must be kept in mind is that the lamprey run is in early spring as soon as the ice goes out, continues on during May and June and is practically over by the end of June or early in July. After July we take the electrodes



off and remove them from the stream; there is no barrier of any description at that time. Up to the beginning of July these by-pass traps collect a high percentage of certain desirable fish trying to get up the stream. The fish of most concern in Lake Superior is the rainbow trout which was introduced to these waters and is sought after by sport fishermen. A small percentage of most species in the stream are affected by the electric barrier, but most get into the traps and we take them out and move them upstream to allow them to go on to their spawning areas.

Mr. BARNETT: What are the other species?

Dr. SPRULES: The main mass of fish going in at the same time as the lamprey is the common sucker.

Mr. BARNETT: About which you are not too concerned?

Dr. SPRULES: There is not too much concern about it. There is no other desirable fish, other than the rainbow trout, being taken in quantity in streams at the same time as the lamprey run.

Mr. BARNETT: I was wondering whether there was any other known instance of the invasion of the sea lamprey into an inland commercial fishing area?

Dr. SPRULES: No precedent that we know of; but a long time ago the lamprey came up into Lake Ontario—many, many years ago—and has run up the tributaries of New York State into many small inland lakes, but there is no commercial fishery there; they are small sport fishing lakes only. I do not know of any country on the other side of the Atlantic Ocean where they may have happened.

Mr. BARNETT: Is it a species widespread throughout the oceans of the world?

Dr. SPRULES: This is a species very common in the Atlantic Ocean that runs into streams on both sides of the ocean to spawn.

Mr. BARNETT: Is it found in the Pacific?

Dr. SPRULES: It is a different species in the Pacific. There are lampreys but not the same species.

Mr. BARNETT: I was wondering whether at any time we might be faced with a similar problem on our British Columbia coast, and whether, for example, there is any possibility of this species or a similar species invading our rivers and lakes where our sockeye salmon are.

Hon. Mr. SINCLAIR: That had concerned me as a layman. The lamprey in the Great Lakes found a habitat almost like the sea except that it was not salty, and it adjusted itself to this new environment where it has no natural enemies, as it has in the sea. The same thing is true on the west coast. In your riding, Mr. Applewhaite, there are lampreys. When they return to the sea there are predators, such as cod and dogfish, which attack it, but there is nothing in the Great Lakes which will touch a lamprey. Am I correct?

Dr. SPRULES: You are quite right up to the present day. When a species is introduced into a new environment—you have seen examples of it, the starling here and the rabbit in Australia—they spread very rapidly. One reason for the spread is there are no natural predators since they are not recognized as a food item. At the present time we have found lampreys in raccoons. Raccoons evidently go down to the streams and take lampreys. The great blue heron has taken lamprey, and now the gull on the Great Lakes is starting to feed on lamprey. This is a hope for there are a lot of seagulls.

Mr. BARNETT: As you can see, the point of that question would be whether the research work contemplated here would eventually be of benefit to us in connection with our seacoast fisheries.

The CHAIRMAN: Mr. Barnett, if you have finished, Mr. Bryce has a question.

Mr. BRYCE: You mentioned something about ultrasonics. Could you tell us more about that? I know what a whitefish, a pickerel and a goldeye are, but that is the extent of my knowledge.

Dr. SPRULES: At the present time there are devices which may be manufactured to make sounds which are outside the limit of our hearing. They are too high pitched for our hearing to receive the sound. Sometimes those sounds have a very great effect on animals and may even kill them we think. At the present time the Fisheries Research Board is considering the development of a device which will produce a supersonic sound, a sound above our hearing, and if we can place that on a river bank and have it shooting out in the water it may be that we can either delay the lamprey sufficiently long that death overtakes it or actually kill it if the frequency of that sound is right. This will be extremely valuable in the access waters to the lakes. We will not have completed the business when all the lamprey are dead in Lake Superior because they can still come in through the Sault Ste. Marie locks. It may be that supersonics will be the answer. It is a high frequency sound which we think we can produce under water, which may kill.

Mr. BRYCE: And you could arrange that so that it would not kill the other fish you wish to keep?

Dr. SPRULES: The man who has thought up this device says yes, but he has not built or tested a device; it is on paper, and we would want to test it. I think the effect would be different on different species of fish and it may be possible to set it to kill only lampreys or fish of similar structure.

Mr. MURPHY (*Lambton West*): How much of the amount set up in the estimates would be for research and how much for construction and operation and maintenance of these devices?

Hon. Mr. SINCLAIR: For 1955-56 in our estimates we have a separate research program: for administrative purposes \$25,000 with a similar amount being provided by the province of Ontario making a total of \$50,000. Under the current arrangement with the province the general fisheries research will involve about \$200,000 contributed by the provincial government and our amount for lamprey control is \$330,000.

Mr. MURPHY (*Lambton West*): How much by the 8 states in the United States with the federal government contributing?

Hon. Mr. SINCLAIR: We do not know that. What we are doing now in research is shared with the province of Ontario. The two of us are going ahead with the program with the anticipation of the approval of this commission. When the commission is set up they will put before the two national governments the program they think necessary to successfully combat the lamprey and go ahead with research. It will be done in the same way as with the other commissions, the Salmon and Halibut Commissions, where each year they budget for a certain amount which is split between us equally. There will be some negotiation of division of costs as the Americans are obviously going to get more benefit out of it since Lake Michigan is entirely American.

Mr. MURPHY (*Lambton West*): This must be a clipping from a Washington paper, but I notice it quotes Warren F. Looney, a state official who says:

"It was estimated that it would take 6 to 8 years to bring the lamprey under control."

Hon. Mr. SINCLAIR: That is just one life cycle.

Mr. MURPHY (*Lambton West*): "Senator Charles Potter urged ratification of the treaty and said Canada is spending as much on lamprey control as the

8 United States states fighting it in the Great Lakes." That is the reason I asked that question. I thought that the United States would be spending more than Canada.

Hon. Mr. SINCLAIR: Perhaps we have more concern about the problem than they have.

Mr. APPLEWHAITE: What proportion of lamprey eggs sprawn and actually become adult lampreys?

Dr. SPRULES: I cannot answer that, sir. The average female produces 60,000 eggs and may run as high as 100,000. We have not found any figure on the percentage of survival of that average 60,000 egg mass which would develop into larvæ and thence adults. It must be a very small percentage which actually becomes adults of course. There are as many as 20,000 adult lampreys taken out of one of these streams each year. In one stream if the females in the 20,000 produced 60,000 eggs each there would be more lamprey than water in the Great Lakes. The loss must be very heavy, perhaps down to 10 or 20 per cent at hatching.

The CHAIRMAN: I think it was suggested that we might have a short statement on research by Dr. Pritchard.

Dr. PRITCHARD: Mr. Chairman, may I for the benefit of Mr. Murphy make the statement that Dr. Sprules is in a somewhat unique position. He is with the Department of Fisheries but before he came to the department he did a lot of work on the Great Lakes in this co-operative research program with the Ontario government. He was an employee of the Fisheries Research Board, and when we took over this co-operative program he, in co-operation with Dr. F. E. J. Fry, took charge of the research, even though he is with the federal department. That is the reason why he knows so much about the research which was carried on, and I would like him to make the statement.

The CHAIRMAN: That would be perfectly satisfactory.

Dr. SPRULES: I might approach this subject from two viewpoints. The first is the reason for undertaking fundamental research on the Great Lakes. I believe that will be obvious to everyone. The Great Lakes system is the largest fresh water system in the world, I believe. The commercial fishery is certainly the largest fresh water fishery in the world and in addition to that we have one of the greatest complexities of species which is found anywhere. There are about 120 different species of fish in the Great Lakes. If we take a lake in northern Canada, such as Great Slave Lake, we would find that there might be ten species of fish there. When you are thinking of managing a lake and having it produce properly and it contains 120 separate species of fish all of which are competing for food, space and spawning area, the problem becomes much greater. An intensive research program is then required to determine fundamental knowledge of the habits—all the habits—of every species of fish.

In the past the research work has been sporadic—a touch here and a touch there. The cisco population in Lake Erie declines—and after it declines scientists are asked to explain why. Lamprey come into the Great Lakes and the lake trout population declines; scientists are asked why. We think that if we started a good fundamental research program on all of the lakes at this time, and if we built up a volume of knowledge about the habits and life cycle of each species we would be able to go a long way in being able to prevent these crises. Certainly we would be able to forecast a crisis instead of having to find an explanation after it had happened.

Secondly the present program of research is an extensive one. There are many problems which are common to all the lakes, and then there are problems which are specific for each lake. The sort of problems which are found in every lake concern a general knowledge of water currents, the distribution of food in

the water, inquiry into bottom types so that we may know where fish spawn, tagging programs to ascertain where the fish go, and that sort of thing. Then we come to specific problems such as the whitefish population in Lake Ontario and the multitude of species in Lake Erie, all contributing to the commercial catch. One of the major problems in our Great Lake system now is that we do not know how to use about 110 of the species of fish which are produced in the lakes. We have a market for about ten species—lake trout, whitefish, smelt, pike, pike-perch and so on. But as I say there are about 110 other species which are using food and taking up space which perhaps should be available for the more desirable species. We cannot begin to manage the lakes and suggest measures to have the lakes produce their maximum yield on a consistent annual basis unless we accumulate a great background of information concerning the habits of every species. I think there is perhaps nothing more which need be said.

The CHAIRMAN: Thank you very much.

Hon. Mr. SINCLAIR: It might be interesting just to put on the record the names of the commercial species which are included in our catch figures here: blue pike-perch, carp, catfish, tullibee, eels, lake herring, lake trout, pike, yellow perch, sturgeon, whitefish, yellow pike-perch, bullheads, ling, menominee, suckers or mullets, rock bass, saugers, sheepshead, smelt, sunfish, white bass, dogfish. All these species are included under commercial fisheries.

Mr. MURPHY (*Lambton West*): From what you have said, Dr. Sprules, and from the report I have here, I gather that the loss to Canadian and United States fishermen in Lake Huron and Lake Michigan amounts to \$5 million a year—would that be about right?

Dr. SPRULES: That figure relates to lake trout produced only from Lake Huron and Lake Michigan. That represents the loss in income from the lake trout decline.

Mr. MURPHY (*Lambton West*): That is what I mean.

Dr. SPRULES: The overall value of the fisheries is larger currently.

Mr. MURPHY (*Lambton West*): No. I had in mind just the value of the lake trout.

Dr. SPRULES: 11,000,000 pounds and roughly \$5 million.

Mr. MURPHY (*Lambton West*): How much is being allocated for research?

Hon. Mr. SINCLAIR: In this present period we have moved into the field with a total of \$50,000 this year. Your figure, Mr. Murphy, is a little deceptive in one way. As Dr. Sprules has pointed out the removal of the lake trout has brought about a greater production of lesser fish, with the result that the total value of the fisheries has not changed very much in recent years.

Mr. MURPHY (*Lambton West*): I appreciate that. However, it may be that the fishermen have needed to fish more intensively in order to make a living, and that might have to be taken into consideration.

Hon. Mr. SINCLAIR: We spent \$2 million on research on the coastal commercial fisheries for which we have direct responsibility. Even today we have not got direct responsibility in the Great Lakes, but we are moving in because there is a need. If we had direct control we would use all the facilities of our department.

Mr. MURPHY (*Lambton West*): I think it should go on record, and I am speaking as a member of this committee, that compared with the loss of lake trout on Lake Huron and Lake Michigan amounting to \$5 million a year the amount allocated to research is picayune. As a member of this committee I am saying this in the hope that the matter can be considered in the serious light that it deserves.

There is just one more point and I am through. When you construct these weirs or control devices in these streams do they have to be installed over a period of several years? You would get the lampreys coming up, say, this year, to spawn. But there would be other ones that had already done the damage.

Dr. SPRULES: That is right. The barrier constructed on the stream is intended only to stop the adult lampreys from reaching an area where they can spawn. They must spawn in gravel. We put our barriers downstream from the first gravel bed. If we could stop all these adults from spawning—supposing, for example, that we had stopped them in 1954—and that it takes them seven years to grow up, then in 1961, if we had stopped every adult in every stream, there would have been no young produced and thus no adults. We must carry on the process for six or seven years. But now, though we may put an installation in to stop the adult lampreys going upstream and spawning we still have six year classes of young lamprey “sitting” in the mud and silt at the mouth of the river to deal with.

Mr. MURPHY (*Lambton West*): You mean in the lake?

Dr. SPRULES: No. At the mouth of the river in the mud. The lamprey, as I explained, spawn in the gravel, and the larvæ afterwards float down into the estuary. They come out of the nests and drift with the current and are deposited in the slack water above the silt at the mouth of the stream.

Mr. MURPHY (*Lambton West*): They are below these devices?

Dr. SPRULES: Yes. In any case the device is not in position when they are going down. They grow up in the mud for five or six years, and then they move out into the lake. One phase of our program is to attack these five year classes which are in the silt and mud. In the course of the showing of the film, members of the committee will have noticed the selective poison experiments, and I may say that we have used a poison which is heavy. The poison is mixed with carbon tetrachloride which causes it to sink to the bottom of the water and kill the lampreys in their little burrows. We need the electric barriers to stop the adult lampreys in the lake from reaching spawning areas. Then to hurry the program if we can we hope to control these several year classes in the estuaries. This would make our work much more effective and rapid. However, the devices will have to be operated for six or seven years at a minimum.

Mr. MURPHY (*Lambton West*): In your recent program in the Great Lakes area was it also the intention of those engaged in that work to study the various phases of the economics of fishing in the Great Lakes?

Hon. Mr. SINCLAIR: The economics of the fishing in the Great Lakes is more the work of the Department of Fisheries. The research board as such is primarily concerned with pure research. We have stations on the two coasts and a central station at Winnipeg. We have no station on the Great Lakes. The provincial government maintains a station on Manitoulin Island. The economics of the fisheries are in the hands of those who administer the fisheries—the provincial governments in inland waters and the federal government on the coasts. We have a markets and economics branch which does surveys in relation to fishermen's income and so on but we are not in a position to do that on the Great Lakes, since we have no officers working in the area.

Mr. MURPHY (*Lambton West*): Suppose the fishermen in one area had a complaint to make, say, about dockage...

Hon. Mr. SINCLAIR: Even on the west coast if fishermen had to complain about wharfs or docks they would not complain to the Fisheries department but to the Department of Public Works. The Department of Fisheries has no control over the Department of Public Works.

Mr. MURPHY (*Lambton West*): I know that, but when you are carrying out this research with the idea of stimulating the fishing industry in the Great Lakes you would have regard to the various arguments which might be submitted by the fishing industry with respect to their problems?

Hon. Mr. SINCLAIR: Problems relating to the fisheries—not problems relating to the marketing or the transportation of the catch.

Mr. MURPHY (*Lambton West*): I did not mean marketing. But after all like every other big industry the fishing industry has its problems. Let us suppose that dockage, or high water levels—or low water levels—were creating difficulties. Would these things be of interest to the research board, and would they be taken into account?

Hon. Mr. SINCLAIR: The question of water levels, if it is going to affect spawning grounds is certainly very much a problem for the Research Board. But water levels as far as they might affect the docks are the concern of those who own the docks. We have always kept the department away from those particular matters which are the concern of other departments—wharfs, docks and so on which are a matter for Public Works. However, we do urge the building of harbours where there is a concentration of fishermen, but, as I say, it is a matter for another department. We are concerned here with pure research into the habits and population of fish in the Great Lakes.

Mr. MURPHY (*Lambton West*): Has any research been done on the effect on different types of spawn caused by high water levels on the Great Lakes?

Dr. SPRULES: Yes, there is a lot of information available on water levels and the percentage of survival.

Mr. MURPHY (*Lambton West*): Is the high water level disastrous to the production?

Dr. SPRULES: Not necessarily at all. It depends on the species and the period when the high water occurs. If the high water occurs at spawning time allowing fish to move further inshore and then the level decreases when the eggs are developing it is important, but the fluctuations on the Great Lakes are in general not that severe.

The CHAIRMAN: I might say, gentlemen, that I am very glad to see here this morning Mr. C. Gordon O'Brien who is the manager of the Fisheries Council of Canada. I understand he has no representation to make to the committee, but in this regard I would like to say that on Friday last I met Dr. A. O. Blackhurst who is the managing director of the Ontario Council of Commercial Fisheries, at Port Dover, Ontario. He expressed his regret that, because of a previous engagement he was not able to attend the meeting today. I understand that in Ontario there are approximately 1,780 commercial fishermen and I believe they stand behind this treaty 100 per cent. I am certainly glad to know that and I anticipated that the people would be in favour of the treaty. However, I mention this because Dr. Blackhurst is not able to attend the meeting this morning.

Are there any other questions on research before we begin a study of the bill itself?

Shall clause 1, "Short title", carry?

1. This Act may be cited as the *Great Lakes Fisheries Convention Act*.

Mr. PEARKES: Concerning clause 1, I wanted to say that we have engaged in an interesting and scientific discussion this morning, but, having been sitting on another committee which has spent a good many hours discussing provincial waters during this session, there are one or two questions I would like to ask on the bill itself. It seems to me that this is either a big constitutional change

or a change in constitutional administration, if I might put it that way. I understood that until 1953 the federal government had not taken any interest in the Great Lakes fisheries, is that correct?

Hon. Mr. SINCLAIR: The actual administration of the Great Lakes fisheries is in the hands of the province. As far as the constitutional point is concerned, the federal government has control over the fisheries in the lakes, streams and the sea, and there is no question about it. We have, however, worked out an arrangement over the years acceptable to both sides by which the provinces administer sport fishing as our agent, and also the inland commercial fisheries. We do general research on sea fisheries, and the Quebec Commercial fisheries too, because they are sea fisheries in the gulf of the St. Lawrence and are therefore like the maritime and Newfoundland fisheries. In the prairie provinces we have an experimental station at Winnipeg which specializes in fresh-water fish. We of course have the inland fisheries in the Yukon and the Northwest Territories under our direct control. When Great Lakes conservation became an international matter it was obvious that the province of Ontario could not do anything about the decline in lake trout unless action was taken by the United States. The provincial authorities came to us and we agreed in 1946 to try and get an international treaty under which the federal governments would exercise sovereignty over the fisheries.

The commission will be exactly the same, as far as authority and action is concerned, as a commission which is familiar to you—the international Pacific Salmon Commission. The state of Washington actually exercises much more authority over the salmon fishing than does the fisheries department in the United States, but they give authority to the Salmon Commission and the commission controls its own research program and advises on the regulations which should be imposed on the fishermen to make their conservation policies effective.

Mr. PEARKES: Then I take it that the province of Ontario has surrendered the control it has had up until now over the commercial fishing?

Hon. Mr. SINCLAIR: No, it has surrendered nothing. All we are doing is work on research. With research, for example, we are setting up a commission which is going to study the fisheries of the Great Lakes, and over the years it will recommend certain regulations, fishing seasons and the type of gear, just as the International Salmon Commission does now. That is why I used the example of the Salmon Commission. The regulations of the Salmon Commission are enforced by the governments concerned. In any case, even now, any regulation on fisheries in the Great Lakes has to be passed by the federal government. The province asks us to pass the regulations it desires, because we have the legal authority.

Mr. PEARKES: In the past you have been publishing the regulations as to when the season shall start and if necessary the quantity of fish which might be caught?

Hon. Mr. SINCLAIR: Yes, for all ten provinces, but we do that at their request and it is a formality because they are our agents in this field. We do not tell them, "These are the regulations", but rather take the regulations they request and give them legal sanctions by order-in-council.

Mr. PEARKES: Now, in the future, is that policy going to be adhered to, or are you going to change that policy?

Hon. Mr. SINCLAIR: It is exactly the same.

Mr. PEARKES: The same policy?

Hon. Mr. SINCLAIR: Yes.

Mr. PEARKES: I ask that question because there are some punitive clauses in this bill, and I wondered if these punishments would be inflicted for the breaking of the regulations which have been passed by the Ontario department?

Hon. Mr. SINCLAIR: They do not pass any regulations; we pass the regulations.

Mr. PEARKES: The regulations are passed by you on the recommendation of the Ontario department?

Hon. Mr. SINCLAIR: Yes. The regulations will be passed on the recommendation of the international commission. They will suggest to us the regulations they should like to have adopted, but the actual administration comes under the jurisdiction of the game wardens of the Ontario Lands and Forests department who enforce the regulations just as they do now. We do not have a protective service on the Great Lakes.

Mr. PEARKES: You have no protective service?

Hon. Mr. SINCLAIR: No, not on the Great Lakes.

Mr. PEARKES: When it comes to a question of constructing these various dams and so forth, I take it they will be up the streams and not actually on the Great Lakes in many instances, although it may be otherwise. Who will do the actual work of the construction and who will provide the money to construct these appliances—the federal government or the provincial government?

Hon. Mr. SINCLAIR: To date it has been done by the federal government. We had an appropriation last year, and are putting up money in this year's estimates. Next year when I hope this commission will have been approved by parliament and by congress there will be in our estimates still another international commission to which money will be voted.

Mr. PEARKES: They will spend the money?

Hon. Mr. SINCLAIR: Yes, just as the Halibut Commission and the Salmon Commission spend their money. It will be voted by congress and by parliament and the commission as such will spend the money.

Mr. STICK: Will they have the right to build those works upstream?

Mr. PEARKES: Just to follow that up for a moment, will the federal government or the commission have to obtain permits from the province of Ontario to construct these works on the streams?

Hon. Mr. SINCLAIR: Yes, just as we had to acquire the property from the province before we could construct Hell's Gate in British Columbia.

Mr. PEARKES: So there will be no power to walk in and say, "We will construct a dam on this stream." A permit for that will have to be issued by the province of Ontario?

Hon. Mr. SINCLAIR: That is right. I might say that the province of Ontario has been extremely eager to see this work proceeded with, and not having the same resources of research that we have, because we have a big department, they have done everything possible to co-operate since 1946 when the problem first arose.

Mr. STICK: Concerning the streams flowing into the Great Lakes where you intend to build these works, they come under the jurisdiction of the provinces and not the federal parliament and you will have to get permission from the provincial authorities in order to build them?

Hon. Mr. SINCLAIR: Yes.

The CHAIRMAN: Shall clause 1 carry?

Carried.



Shall clause 2 carry?

Carried.

Shall clause 3 carry?

3. The Convention is hereby approved and confirmed.

Mr. PEARKES: Clause 3 is confined solely to the work in relation to the sea lamprey and general research work and those are the only two points which are made in the convention? Do I understand that is the sole sphere of the activity of the convention—the work on the lamprey?

Hon. Mr. SINCLAIR: The general management of the Great Lakes fisheries, as far as fisheries research is concerned, just one aspect of which is lamprey control.

Mr. PEARKES: Did you say the general management of research and general management of fisheries?

Hon. Mr. SINCLAIR: The general management of this fisheries is in the hands of the Lands and Forests branch of Ontario, just as in British Columbia the sports fishing is handled by the provincial game department.

Mr. MURPHY (*Lambton West*): You are not limiting to the convention just the destruction of the lamprey and if there is another evil which is curbing the fishing industry you would also tackle that problem?

Hon. Mr. SINCLAIR: Lamprey control is only one aspect of the whole research program, and it is the one catching the public's interest at the moment. However, as Dr. Sprules said there are many other problems in managing so complex a fishery.

The CHAIRMAN: Shall clause 3 carry?

Carried.

Shall clause 4 carry?

4. (1) Notwithstanding any other Act, the Governor in Council may make regulations for carrying out and giving effect to the provisions of the Convention and anything done by the Commission thereunder.

(2) Every person who violates a regulation is guilty of an offence and is liable on summary conviction to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding one year, or to both fine and imprisonment.

Mr. PEARKES: The commission would have the right to lay down the size of the mesh in the nets and anything like that?

Hon. Mr. SINCLAIR: They recommend.

Mr. PEARKES: They recommend it to you, and you would apply that?

Hon. Mr. SINCLAIR: Yes.

Mr. PEARKES: And anyone breaking that type of regulation would be liable to the penalties set out in clause 4?

Hon. Mr. SINCLAIR: Yes, but the enforcement would be in the hands of the officers of the Department of Lands and Forests of the province of Ontario; the ones who are doing the job now.

The CHAIRMAN: Shall clause 4 carry?

Carried.

Shall clause 5 carry?

Carried.

Shall clause 6 carry?

Carried.

Shall the schedule carry?

Carried.

Shall the Preamble carry?

Carried.

Shall the title carry?

Carried.

Shall the bill carry?

Carried.

Shall I report the bill without amendment?

Agreed.

The CHAIRMAN: Gentlemen, I would like to say that at the last meeting I was given authority to nominate a subcommittee on agenda and procedure. I do not know if there will be any other business referred to us by the House but, in any event I would like to name that sub-committee now. It will consist of myself as Chairman and Messrs. Applewhaite, Bryce, MacNaught, Murphy (*Lambton West*), Patterson and Stuart (*Charlotte*).

I would like to thank the minister, the deputy minister and the other gentlemen who have been with us this morning. I should also like to thank the members of the committee for their attendance and co-operation. I now declare the meeting adjourned to the call of the Chair.

## APPENDIX "A"

2nd Session, 22nd Parliament, 3-4 Elizabeth II, 1955.

## THE HOUSE OF COMMONS OF CANADA.

## BILL 279.

An Act to Implement a Convention on Great Lakes Fisheries between Canada and the United States.

Her Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

- Short title. 1. This Act may be cited as the *Great Lakes Fisheries Convention Act*.
- Definitions. "Commission" 2. In this Act  
"Convention" (a) "Commission" means the Great Lakes Fishery Commission established under the Convention; and  
(b) "Convention" means the Convention on Great Lakes Fisheries between Canada and the United States set out in the Schedule.
- Convention approved. 3. The Convention is hereby approved and confirmed.
- Regulations. 4. (1) Notwithstanding any other Act, the Governor in Council may make regulations for carrying out and giving effect to the provisions of the Convention and anything done by the Commission thereunder.  
(2) Every person who violates a regulation is guilty of an offence and is liable on summary conviction to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding one year, or to both fine and imprisonment.
- Offence and penalty. (2) Every person who violates a regulation is guilty of an offence and is liable on summary conviction to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding one year, or to both fine and imprisonment.
- Jurisdiction. 5. All courts, justices of the peace and magistrates in Canada have the same jurisdiction with respect to offences under the regulations as they have under sections 689 to 692 of the *Canada Shipping Act*, with respect to offences under that Act, and the provisions of those sections apply to offences under the regulations in the same manner and to the same extent as they apply to offences under the *Canada Shipping Act*.
- Coming into force. 6. This Act shall come into force on a day to be fixed by proclamation of the Governor in Council and shall continue in force until a day to be fixed by proclamation of the Governor in Council following upon the termination of the Convention and no longer.

SCHEDULE  
 CONVENTION ON GREAT LAKES FISHERIES  
 BETWEEN  
 CANADA  
 AND  
 THE UNITED STATES OF AMERICA

The Government of Canada and the Government of the United States of America,

Taking note of the interrelation of fishery conservation problems and of the desirability of advancing fishery research in the Great Lakes,

Being aware of the decline of some of the Great Lakes fisheries,

Being concerned over the serious damage to some of these fisheries caused by the parasitic sea lamprey and the continuing threat which this lamprey constitutes for other fisheries,

Recognizing that joint and coordinated efforts by Canada and the United States of America are essential in order to determine the need for and the type of measures which will make possible the maximum sustained productivity in Great Lakes fisheries of common concern,

Have resolved to conclude a convention and have appointed as their respective Plenipotentiaries:

The Government of Canada:

Arnold Danford Patrick Heeney, Ambassador Extraordinary and Plenipotentiary of Canada to the United States of America, and Stewart Bates, Chairman of the Delegation of Canada to the Great Lakes Fisheries Conference; and

The Government of the United States of America:

Walter Bedell Smith, Acting Secretary of State of the United States of America, and William C. Herrington, Chairman of the Delegation of the United States of America to the Great Lakes Fisheries Conference,

who, having communicated to each other their respective full powers, found in good and due form, have agreed as follows:

ARTICLE I.

This Convention shall apply to Lake Ontario (including the St. Lawrence River from Lake Ontario to the forty-fifth parallel of latitude) Lake Erie, Lake Huron (including Lake St. Clair), Lake Michigan, Lake Superior and their connecting waters, hereinafter referred to as "the Convention Area". This Convention shall also apply to the tributaries of each of the above waters to the extent necessary to investigate any stock of fish of common concern, the taking or habitat of which is confined predominantly to the Convention Area, and to eradicate or minimize the populations of the sea lamprey (*Petromyzon marinus*) in the Convention Area.

## ARTICLE II.

1. The Contracting Parties agree to establish and maintain a joint commission, to be known as the Great Lakes Fishery Commission, hereinafter referred to as "the Commission", and to be composed of two national sections, a Canadian Section and a United States Section. Each Section shall be composed of not more than three members appointed by the respective Contracting Parties.

2. Each Section shall have one vote. A decision or recommendation of the Commission shall be made only with the approval of both Sections.

3. Each Contracting Party may establish for its Section an advisory committee for each of the Great Lakes. The members of each advisory committee so established shall have the right to attend all sessions of the Commission except those which the Commission decides to hold *in camera*.

## ARTICLE III.

1. At the first meeting of the Commission and at every second subsequent annual meeting thereafter the members shall select from among themselves a Chairman and a Vice-Chairman, each of whom shall hold office from the close of the annual meeting at which he has been selected until the close of the second annual meeting thereafter. The Chairman shall be selected from one Section and the Vice-Chairman from the other Section. The offices of Chairman and Vice-Chairman shall alternate biennially between the Sections.

2. The seat of the Commission shall be at such place in the Great Lakes area as the Commission may designate.

3. The Commission shall hold a regular annual meeting at such place as it may decide. It may hold such other meetings as may be agreed upon by the Chairman and Vice-Chairman and at such time and place as they may designate.

4. The Commission shall authorize the disbursement of funds for the joint expenses of the Commission and may employ personnel and acquire facilities necessary for the performance of its duties.

5. The Commission shall make such rules and by-laws for the conduct of its meeting and for the performance of its duties and such financial regulations as it deems necessary.

6. The Commission may appoint an Executive Secretary upon such terms as it may determine.

7. The staff of the Commission may be appointed by the Executive Secretary in the manner determined by the Commission or appointed by the Commission itself on terms to be determined by it.

8. The Executive Secretary shall, subject to such rules and procedures as may be determined by the Commission, have full power and authority over the staff and shall perform such functions as the Commission may prescribe. If the office of Executive Secretary is vacant, the Commission shall prescribe who shall exercise such power or authority.

## ARTICLE IV.

The Commission shall have the following duties:

- (a) to formulate a research program or programs designed to determine the need for measures to make possible the maximum sustained productivity of any stock of fish in the Convention Area which, in the opinion of the Commission, is of common concern to the fisheries of Canada and the United States of America and to determine what measures are best adapted for such purpose;

- (b) to coordinate research made pursuant to such programs and, if necessary, to undertake such research itself;
- (c) to recommend appropriate measures to the Contracting Parties on the basis of the findings of such research programs;
- (d) to formulate and implement a comprehensive program for the purpose of eradicating or minimizing the sea lamprey populations in the Convention Area; and
- (e) to publish or authorize the publication of scientific and other information obtained by the Commission in the performance of its duties.

#### ARTICLE V.

In order to carry out the duties set forth in Article IV, the Commission may:

- (a) conduct investigations;
- (b) take measures and install devices in the Convention Area and the tributaries thereof for lamprey control; and
- (c) hold public hearings in Canada and the United States of America.

#### ARTICLE VI.

1. In the performance of its duties, the Commission shall, in so far as feasible, make use of the official agencies of the Contracting Parties and of their Provinces or States and may make use of private or other public organizations, including international organizations, or of any person.

2. The Commission may seek to establish and maintain working arrangements with public or private organizations for the purpose of furthering the objectives of this Convention.

#### ARTICLE VII.

Upon the request of the Commission a Contracting Party shall furnish such information pertinent to the Commission's duties as is practicable. A Contracting Party may establish conditions regarding the disclosure of such information by the Commission.

#### ARTICLE VIII.

1. Each Contracting Party shall determine and pay the expenses of its Section. Joint expenses incurred by the Commission shall be paid by contributions made by the Contracting Parties. The form and proportion of the contributions shall be those approved by the Contracting Parties after the Commission has made a recommendation.

2. The Commission shall submit an annual budget of anticipated joint expenses to the Contracting Parties for approval.

#### ARTICLE IX.

The Commission shall submit annually to the Contracting Parties a report on the discharge of its duties. It shall make recommendations to or advise the Contracting Parties whenever it deems necessary on any matter relating to the Convention.

## ARTICLE X.

Nothing in this Convention shall be construed as preventing any of the States of the United States of America bordering on the Great Lakes or, subject to their constitutional arrangements, Canada or the Province of Ontario from making or enforcing laws or regulations within their respective jurisdictions relative to the fisheries of the Great Lakes so far as such laws or regulations do not preclude the carrying out of the Commission's duties.

## ARTICLE XI.

The Contracting Parties agree to enact such legislation as may be necessary to give effect to the provisions of this Convention.

## ARTICLE XII.

The Contracting Parties shall jointly review in the eighth year of the operation of this Convention the activities of the Commission in relation to the objectives of the Convention in order to determine the desirability of continuing, modifying or terminating this Convention.

## ARTICLE XIII.

1. This Convention shall be ratified and the instruments of ratification shall be exchanged at Ottawa.
2. This Convention shall enter into force on the date of the exchange of the instruments of ratification. It shall remain in force for ten years and shall continue in force thereafter until terminated as provided herein.
3. Either Contracting Party may, by giving two years' written notice to the other Contracting Party, terminate this Convention at the end of the initial ten-year period or at any time thereafter.

In witness whereof the respective Plenipotentiaries have signed the present Convention.

Done at Washington, in duplicate, this tenth day of September, 1954.

For the Government of Canada:

A. D. P. HEENEY  
STEWART BATES

For the Government of the United States of America:

WALTER BEDELL SMITH  
WM. C. HERRINGTON

## APPENDIX "B"

CANADA—CATCH OF TROUT IN GREAT LAKES, BY LAKES AND TOTAL ONTARIO, 1930-1953

(In Hundred Weights)

Year	Lake Superior	Lake Huron				Lake St. Clair, River St. Clair Detroit River	Lake Erie+ Upper Niagara River	Lake Ontario Lower Niagara+ St. Lawrence Rivers	Sub-Total Great Lakes	Northern Inland Waters	Southern Inland Waters	GRAND TOTAL ONTARIO
		North Channel	Georgian Bay	Proper	Sub-Total							
1930.....	15,302	3,513	13,171	12,663	29,347		111	3,637	48,397	1,380	1,428	51,205
1931.....	13,284	3,440	12,893	12,145	28,478		71	3,882	45,715	1,137	1,224	48,078
1932.....	11,237	3,627	13,132	12,925	29,684		18	3,016	43,955	927	1,563	46,445
1933.....	9,683	4,712	13,444	13,434	31,590		15	3,532	44,820	858	859	46,537
1934.....	12,607	6,267	13,340	15,623	35,199		26	2,562	50,394	1,013	1,545	52,952
1935.....	15,184	7,109	14,753	20,692	42,554		3	2,449	60,190	2,137	236	62,563
1936.....	15,962	7,047	14,726	21,375	43,148		2	2,265	61,377	2,774	436	64,587
1937.....	16,986	6,440	15,042	17,537	39,019		2	2,050	58,057	2,806	128	60,991
1938.....	16,678	6,261	14,269	17,473	38,003			2,758	57,439	2,711	255	60,405
1939.....	13,074	5,044	14,489	12,501	32,034			2,688	47,796	2,588	374	50,758
1940.....	12,612	3,541	13,340	10,388	27,269			1,874	41,755	1,637	249	43,641
1941.....	12,985	2,116	15,016	11,098	28,230			1,258	42,473	1,648		44,121
1942.....	13,610	1,234	12,743	8,001	21,978		1	898	36,487	1,966		38,453
1943.....	13,230	255	10,664	5,174	16,093			763	30,086	2,285		32,371
1944.....	15,527	92	8,152	3,158	11,402		1	744	27,674	1,831		29,505
1945.....	14,791	72	7,376	1,174	8,622		1	1,051	24,465	1,424		25,889
1946.....	15,309	60	6,959	295	7,314		18	1,024	23,665	1,479		25,144
1947.....	12,865	28	3,681	65	3,774			638	17,227	1,508		18,785
1948.....	14,480	231	3,117	95	3,443		2	423	18,348	1,484		19,832
1949.....	13,561	531	3,426	32	3,989		217	215	17,982	938		18,920
1950.....	15,063	712	3,342	106	4,160			154	19,377	1,060		20,437
1951.....	12,732	857	4,399	266	5,522			402	18,656	1,096		19,752
1952.....	13,891	648	4,720	516	5,884			320	20,095	1,716		21,811
1953.....	13,711	228	3,212		3,440			138	17,289	1,331		18,620



### APPENDIX "C"

CANADA—CATCH OF WHITEFISH IN GREAT LAKES, BY LAKES AND TOTAL ONTARIO, 1930-1953

(In Hundred Weights)

Year	Lake Superior	Lake Huron				Lake St. Clair, River St. Clair Detroit River	Lake Erie+ Upper Niagara River	Lake Ontario Lower Niagara+ St. Lawrence Rivers	Sub-Total Great Lakes	Northern Inland Waters	Southern Inland Waters	GRAND TOTAL ONTARIO
		North Channel	Georgian Bay	Proper	Sub-Total							
1930.....	3,717	1,924	9,9394	2,466	14,329	7	10,877	5,519	34,449	6,756	14,228	55,433
1931.....	2,560	2,340	9,809	2,452	14,601	3	11,064	5,259	33,487	7,173	12,273	52,933
1932.....	1,934	1,680	11,948	2,192	15,820	8	9,122	4,183	31,067	7,001	10,589	48,657
1933.....	2,450	2,577	14,754	3,095	20,426	.....	7,100	4,736	34,712	6,663	5,904	47,279
1934.....	2,952	2,529	13,830	3,089	19,448	1	9,159	4,895	36,455	5,608	7,167	49,230
1935.....	3,774	3,041	12,922	3,403	19,366	16	11,901	6,574	41,631	13,036	116	54,783
1936.....	3,195	2,602	9,838	2,353	14,793	11	17,677	5,762	41,438	16,338	127	57,903
1937.....	3,008	2,542	11,229	2,870	16,641	4	14,010	5,516	39,179	15,922	84	55,185
1938.....	3,117	1,857	11,962	2,052	15,871	2	10,018	6,023	35,031	14,335	111	49,477
1939.....	3,396	1,572	11,180	1,151	13,903	7	23,122	6,646	47,074	16,497	100	63,671
1940.....	3,850	1,188	8,872	924	10,984	6	31,366	4,036	50,242	13,292	51	63,685
1941.....	3,149	851	7,480	931	9,262	5	33,586	4,416	50,419	13,281	.....	63,699
1942.....	3,197	849	5,939	1,139	7,827	.....	25,240	4,420	40,684	13,660	.....	54,344
1943.....	3,363	491	4,415	5,939	6,038	.....	14,814	3,293	27,508	14,352	.....	41,860
1944.....	4,037	308	3,644	1,425	5,377	.....	12,589	4,609	26,602	15,440	.....	42,042
1945.....	3,586	218	2,793	661	3,672	2	16,894	3,594	27,748	14,904	.....	42,652
1946.....	2,750	249	2,464	1,576	4,289	2	19,322	3,979	30,342	14,169	.....	44,511
1947.....	2,459	769	873	2,919	4,561	.....	27,263	3,578	37,861	11,557	.....	49,418
1948.....	3,057	1,466	2,446	5,379	9,291	.....	37,999	2,367	52,714	12,218	41	64,973
1949.....	2,770	2,725	8,050	2,430	13,205	.....	36,201	2,186	54,362	16,271	.....	70,633
1950.....	3,407	3,099	20,880	3,032	27,011	.....	13,904	4,189	48,511	17,376	.....	65,887
1951.....	3,406	2,018	30,252	3,652	35,922	.....	11,296	3,853	54,477	17,327	.....	71,804
1952.....	2,675	1,163	46,787	7,646	55,596	.....	14,236	4,165	76,672	17,591	.....	94,263
1953.....	2,822	1,339	61,662	1,797	64,798	.....	16,410	2,072	86,102	16,037	.....	102,139

## APPENDIX "D"

## CATCH OF WHITEFISH IN THE UNITED STATES BETWEEN 1920-1953.

(In Hundred Weights)

Year	Lake Superior	Lake Huron	Lake Michigan	Lake Erie	Lake Ontario	Lake of The Woods	Sub-Total Superior, Huron and Michigan	TOTAL
1930.....	2,947	33,798	47,886	3,069	874	998	84,631	89,572
1931.....	4,899	44,915	43,274	12,729	675	1,121	93,088	107,613
1932.....	4,506	43,329	35,576	11,686	546	1,663	83,411	97,406
1933.....	4,831	32,377	4,047	9,972	404	1,432	41,255	53,063
1934.....	4,932	25,658	21,818	7,774	836	1,742	52,408	62,760
1935.....	5,123	18,948	16,971	9,949	405	1,101	41,042	52,497
1936.....	3,741	14,422	10,255	11,584	531	777	28,418	41,310
1937.....	3,636	10,187	10,726	6,475	567	691	24,549	32,282
1938.....	4,554	5,580	12,589	9,109	558	635	22,723	33,025
1939.....	4,970	2,552	9,506	20,981	1,027	763	17,028	39,809
1940.....	6,922	1,881	9,548	26,058	111	665	18,351	45,185
1941.....	7,275	1,137	12,901	24,459	600	562	21,313	46,934
1942.....	7,510	951	13,406	19,239	210	529	21,867	41,845
1943.....	7,317	1,492	14,071	9,490	260	517	22,880	33,147
1944.....	6,633	1,852	17,532	5,674	574	218	26,017	32,483
1945.....	7,173	1,815	16,579	9,000	327	400	25,567	35,294
1946.....	9,149	5,450	25,576	7,970	(441)	335	40,175	48,921
1947.....	9,508	30,229	58,248	17,738	213	376	97,785	116,312
1948.....	12,006	29,719	52,472	27,894	82	328	94,197	125,501
1949.....	12,837	5,302	34,919	34,786	24	503	53,058	88,371
1950.....	10,399	1,142	23,608	16,046	210	639	35,149	52,044
1951.....	4,416	1,426	12,136	8,857	329	441	17,978	27,606
1952.....	3,508	1,676	17,703	13,587	228	466	22,887	37,168
1953.....								

## APPENDIX "E"

## CATCH OF LAKE TROUT, 1885-1952 (UNITED STATES)

(Expressed in Thousands of Pounds)

Year	Lake Ontario	Lake Erie	Lake Huron	Lake Michigan	Lake Superior	International Lakes of Minnesota	TOTAL
	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity	Quantity
1885							
1889	20	107	2,540	6,431	2,488	(1)	(1)
1890	6	67	2,181	5,580	3,367	(1)	(1)
1892	41	121	1,750	8,364	2,613	(1)	(1)
1893	(1)	(1)	2,382	6,437	(1)	(1)	(1)
1894	6	203	3,106	8,526	4,342	(1)	(1)
1895	(1)	(1)	2,039	8,533	(1)	(1)	(1)
1896	(1)	(1)	1,875	7,606	(1)	(1)	(1)
1897	(1)	(1)	1,527	9,020	(1)	(1)	(1)
1899	3	37	1,292	7,823	3,794	(1)	(1)
1903	15	32	1,460	5,285	3,625	(1)	(1)
1908	4	15	1,724	8,943	5,592	(1)	(1)
1913	14	7	1,382	8,631	2,903	(1)	(1)
1914	27	2	2,163	6,305	2,386	90	10,973
1915	29	6	1,365	6,837	1,676	162	10,075
1916	31	16	1,774	7,704	1,373	93	10,991
1917	14	5	1,798	5,999	2,178	75	10,069
1918	24	5	2,111	6,904	1,983	112	11,139
1919	22	21	2,614	5,810	2,326	94	10,887
1920	26	12	2,322	6,554	3,463	91	12,498
1921	28	2	1,220	6,984	2,016	123	10,373
1922	25	46	1,358	11,749	2,124	80	15,282
1923	34	2	1,828	7,540	2,175	98	11,667
1924	36	1	1,827	6,177	1,901	73	10,015
1925	45	1	1,395	7,224	2,565	86	11,316
1926	70	4	1,615	6,894	2,655	130	11,368
1927	61	3	1,685	6,530	3,280	(2)	11,559
1928	42	9	1,692	5,699	3,051	(2)	10,493
1929	43	3	1,598	4,819	2,962	(2)	9,425
1930	62	1	1,283	6,394	2,804	(2)	10,544
1931	24	5	1,729	5,441	2,489	(2)	9,688
1932	14	3	2,049	5,632	2,993	(2)	10,691
1933	18	10	2,165	5,470	3,067	1	10,731
1934	12	4	1,970	5,212	2,493	(2)	9,691
1935	14	(2)	1,576	4,957	3,374	.....	9,921
1936	7	(2)	1,743	4,873	3,476	.....	10,099
1937	8	2	1,400	4,763	3,233	.....	9,406
1938	13	3	1,340	4,988	3,085	.....	9,429
1939	17	(2)	1,270	4,906	3,167	.....	9,360
1940	16	.....	1,372	5,660	2,744	.....	9,792
1941	14	(2)	940	6,266	2,677	(2)	9,897
1942	3	.....	893	6,788	2,854	.....	10,538
1943	1	2	728	6,484	2,959	(2)	10,174
1944	3	(2)	459	6,860	3,053	.....	10,375
1945	4	(2)	363	6,498	3,740	(2)	10,605
1946	1	.....	173	5,437	3,369	.....	8,980
1947	1	.....	38	3,974	3,444	.....	7,457
1948	1	.....	12	2,425	2,964	(2)	5,402
1949	(2)	(2)	4	1,197	2,954	.....	4,155
1950	(2)	(2)	1	342	2,966	.....	3,309
1951	.....	.....	(2)	54	3,202	.....	3,256
1952	2	.....	(2)	11	2,915	.....	2,928
	2	.....	(2)	3	2,838	.....	2,843

(1) Data not available.

(2) Less than 500 pounds.

NOTE.--Data on the International Lakes of Minnesota include only the catch from Lake of the Woods prior to 1926. The data in this table were taken from the Report of the International Board of Inquiry for the Great Lakes Fisheries and from the annual statistical publications of the Fish and Wildlife Service. In some years, small quantities of related species may have been included in the data.

## GREAT LAKES COMMERCIAL FISHERY STATISTICS, BY LAKES

(Quantity shown in thousands of pounds.)

Year	LAKE ONTARIO						LAKE ERIE					
	U.S.A.		CANADA		TOTAL		U.S.A.		CANADA		TOTAL	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
1930.....	682	65	4,021	265	4,703	330	29,540	1,655	12,680	710	42,220	2,365
1931.....	442	37	2,869	205	3,311	242	34,772	1,699	13,807	771	48,579	2,470
1932.....	521	37	2,232	162	2,753	199	33,670	1,439	12,733	703	46,403	2,142
1933.....	527	40	2,551	186	3,078	226	26,187	1,068	10,231	554	36,418	1,622
1934.....	717	55	2,231	163	2,948	218	32,809	1,433	11,500	632	44,309	2,065
1935.....	770	54	2,723	199	3,493	253	30,356	1,644	14,429	794	44,785	2,438
1936.....	601	46	3,126	212	3,727	258	36,777	2,154	11,953	706	48,730	2,860
1937.....	618	52	3,330	222	3,948	274	26,933	1,436	14,664	826	41,597	2,262
1938.....	690	54	3,068	212	3,758	266	27,619	1,981	14,501	797	42,120	2,778
1939.....	1,456	108	3,495	232	4,951	340	28,663	2,216	14,263	868	42,926	3,084
1940.....	1,359	92	3,022	187	4,381	279	22,944	1,772	9,767	690	32,711	2,462
1941.....	597	59	3,126	193	3,723	252	22,063	1,883	8,950	657	31,013	2,540
1942.....	325	39	2,488	156	2,813	195	24,131	2,741	10,037	660	34,168	3,401
1943.....	395	60	2,281	358	2,676	418	27,115	4,134	14,483	2,132	41,598	6,266
1944.....	400	68	2,637	425	3,037	493	28,837	3,320	15,255	1,891	44,092	5,211
1945.....	492	74	2,338	385	2,830	459	28,631	4,267	18,949	3,698	47,580	7,965
1946.....	384	68	2,059	317	2,443	385	29,121	4,489	18,925	3,088	48,046	7,577
1947.....	464	81	2,002	312	2,466	393	19,818	3,813	12,334	2,675	32,152	6,488
1948.....	386	65	2,045	290	2,431	355	26,502	4,102	14,926	3,024	41,428	7,126
1949.....	351	53	2,006	258	2,357	311	34,249	4,618	19,093	2,943	53,342	7,561
1950.....	189	44	2,219	309	2,408	353	23,982	4,572	16,866	3,149	40,848	7,721
1951.....	498	107	2,410	424	2,908	531	20,921	4,448	13,144	2,892	34,065	7,340
1952.....	668	173	2,281	393	2,949	566	25,351	4,357	17,417	3,249	42,768	7,606
1953.....			2,060	284					23,389	3,089		

"F"

## QUANTITIES AND VALUES—U.S.A., CANADA AND TOTALS, 1930-1953

(Value shown in thousands of dollars.)

LAKE HURON						LAKE MICHIGAN		LAKE SUPERIOR					
U.S.A.		CANADA		TOTAL		U.S.A.		U.S.A.		CANADA		TOTAL	
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
16,377	1,320	6,893	625	23,270	1,945	30,973	2,159	14,694	695	4,761	356	19,455	1,051
17,727	1,510	7,247	656	24,974	2,166	25,059	1,991	11,281	628	3,169	260	14,450	888
15,848	1,143	7,492	686	23,340	1,829	20,692	1,236	10,173	379	2,488	212	12,661	591
13,351	955	7,813	739	21,164	1,694	21,682	1,412	10,653	478	3,108	241	13,761	719
14,512	955	7,550	733	22,062	1,688	28,444	1,837	17,533	723	3,988	297	21,521	1,020
13,676	1,224	8,402	824	22,078	2,048	25,089	1,943	17,874	941	3,578	297	21,452	1,238
12,790	1,000	7,835	766	20,625	1,766	25,783	2,131	16,008	928	4,900	364	20,908	1,292
11,895	951	7,675	742	19,570	1,693	26,398	2,563	16,011	919	4,509	350	20,520	1,269
12,039	760	7,303	710	19,342	1,470	24,379	2,294	14,856	875	4,057	327	18,913	1,202
13,353	866	6,456	619	19,809	1,485	23,027	2,570	16,783	922	3,307	269	20,090	1,191
9,099	680	5,662	533	14,761	1,213	22,814	2,050	20,672	904	3,319	277	23,991	1,181
8,727	681	5,423	516	14,150	1,197	22,918	2,374	22,111	1,310	3,436	274	25,547	1,584
8,465	1,011	4,779	435	13,244	1,446	21,404	3,204	19,228	1,498	3,363	272	22,591	1,770
8,610	1,075	4,419	906	13,029	1,981	22,174	4,598	18,372	2,215	3,347	511	21,719	2,726
6,432	832	3,492	709	9,924	1,541	19,252	4,342	19,245	2,246	3,761	530	23,006	2,776
7,475	1,129	3,029	673	10,504	1,802	22,090	5,571	18,725	2,574	3,812	696	22,537	3,270
7,147	842	2,535	524	9,682	1,366	22,392	3,907	17,848	2,219	3,589	639	21,437	2,858
8,034	1,153	2,040	432	10,074	1,585	24,958	3,876	14,987	1,674	2,830	503	17,817	2,177
8,836	1,362	2,798	700	11,634	2,062	27,023	4,596	19,221	2,347	3,371	675	22,592	3,022
5,581	595	3,372	822	8,953	1,417	25,573	3,823	17,730	2,100	3,188	561	20,918	2,751
5,073	411	4,762	1,171	9,835	1,582	27,077	3,661	12,584	1,977	2,655	626	15,239	2,603
5,521	553	5,742	1,879	11,263	2,432	27,648	3,461	14,035	1,921	2,851	641	16,886	2,562
6,118	716	7,527	1,872	13,645	2,588	32,061	4,065	15,465	1,998	3,127	661	18,592	2,659
		8,729	2,081							2,771	590		

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