J.L. Goodier - M.Sc. Thesis 1977-81

Correspondence

Environment Canada | Environnement Canada
Fisheries and Marine | Pêches et Sciences de la mer

February 22, 1977

Your file / Votre référence

Our file / Notre référence
725-8-5

Dr. E. H. Brown, Jr.
Chairman, Lake Michigan
Lake Trout Technical Committee
U.S. Dept. of the Interior
Fish and Wildlife Services
Great Lakes Fishery Laboratory
1451 Green Road
Ann Arbor, Michigan 48105

Dear Dr. Brown:

Re: Re-establishment of lake trout in Lake Michigan

I regret that since I am in the process of preparing to do some work out of the country for the next three months I have not been able to give this problem the attention it deserves. In brief, I think that there is sufficient evidence that natural selection has resulted in salmonid populations designed for specific environments to warrant the maintenance of the Green Lake Stock.

Examples of inherited responses of salmonids to major or subtle environmental factors are numerous. Groot found innate orientation of sockeye smolts and related this to the shape of Babine Lake. Brannon showed that sockeye fry responded to current with the same behavior pattern exhibited in their natural environment. Ihssen and Tait found that gas retention i.e. buoyancy capability, in populations of lake trout was correlated with depth distribution of the parent population which itself was correlated with the depth of the lake. Simon and Larkin consider the implications of the "stock concept" for Pacific salmon. Most of the material is on anadromous salmonids because the implications of innate behavioral differences are more readily apparent. I feel such differences are probably just as important in non anadromous lake trout which still exhibit strong migratory behavior. I don't mean to denigrate the importance of conditioning in the hatchery but I think any pre-planting manipulation is useless if the stock is genetically unsuited to the environment.

I don't want to appear to be giving off the cuff answers to your six questions but I suppose that's what these responses are.

Freshwater Institute
501 University Crescent
Winnipeg, Manitoba
R3T 2N6
(204) 269-7379

Institut des eaux douces
501 University Crescent
Winnipeg (Manitoba)
R3T 2N6
(204) 269-7379

1. The genetic constitution of planted fish is likely to be very important in re-establishing self-sustaining stocks.

2. Not so seriously as to warrant discarding the stock.

3. Yes

4. Probably

5. I think they are more likely at imprinted at stocking sites.

6. I don't know.

I hope this has been of some assistance. I feel that the genetic constitution of planted stocks is very important. Unfortunately the answers will never be very clear cut.

Yours sincerely

G. Burton Ayles
Research Scientist
Aquaculture

GBA/an
Attachment

1. Brannon, E. L., 1967. Genetic control of migrating behavior of newly emerged sockey salmon fry. Int. Pac. Sal. Fish. Com. Progress Rep. No. 16 : 31 pp

2. Groot, C.. 1965. On the orientation of young sockey salmon (Onchosynchus nerka) during seaward migration out of lakes. Behavior Suppl. XIV, 198 p.

3. Ihssen, P., and J. S. Tait. 1974. Genetic differences in retention of swimbladder gas between two populations of lake trout (S. namaycush) J. Fish Res. Board Can. 31: 1351-1354.

4. Simon, R.C. and P. G. Larkin. 1972. The stock concept in Pacific salmon. H. R. MacMillan Lectures in Fisheries. The University of British Columbia, Vancouver, B.C. 230 pp.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Great Lakes Fishery Laboratory
1451 Green Road
~~RxAxRmxXXX~~
Ann Arbor, Michigan ~~XMIX~~ 48105

IN REPLY REFER TO:

January 11, 1977

Dr. Burton Ayles
Dept. of the Environment
Fisheries & Marine Service
Research & Development Directorate
501 University Crescent
Winnipeg, Manitoba R3T 2N6

Dear Dr. Ayles:

On behalf of the Lake Michigan Lake Trout Technical Committee, an inter-agency working group sponsored by the international Great Lakes Fishery Commission, I am seeking advice from fish behaviorists, geneticists, and allied specialists in Canada and the U. S. on genetic considerations involved in the reestablishment of self-sustaining stocks of lake trout (Salvelinus namaycush) in Lake Michigan. The native stocks that supported a commercial fishery beginning in the 1800's have long been extinct because of intense exploitation and sea lamprey predation in the 1940's and 1950's. Since about 1965, sea lampreys have been controlled to a substantial degree by subjecting their ammocoetes to a chemical larvacide in spawning streams, and about 2.2 million fingerling trout have been stocked each year usually as yearlings--about 5 inches long and running 20 to 30 per pound.

The present adult standing stock of roughly several million hatchery-reared lake trout has not produced sufficient numbers of fry and fingerlings to have been detected by widespread sampling, even though large numbers have been observed spawning at many locations along the shoreline each year since 1970 and there is some indication that a few may have spawned in off-shore waters. Failure of the predominantly shallow-water spawning to result in any detectable production of fingerling lake trout may be attributed to the adverse effects of severe wave action, scouring by ice, and shifting substrate on the eggs and larvae. In contrast, native lake trout were known to have spawned to a considerable extent over deeper, off-shore reefs where conditions for survival apparently were better.

The propensity for spawning close to shore is attributed by many to conditioning or selection in the hatchery and possibly to imprintation at near-shore stocking sites where many of the hatchery fish have been planted. An average of 30% of the young trout stocked each year have actually been released in deeper off-shore waters, although not necessarily over good spawning areas, and many of these fish have also later been identified as adults in the shoreline spawning aggregations. The fact that a fairly high proportion of eggs from the stocked fish will hatch when cultured in the laboratory adds credence to the hypothesis that selection of poor spawning sites is a major factor now limiting survival of larval trout.

The only strong indication to date from the Great Lakes that naturally-produced progeny of stocked lake trout have survived to fry and fingerling life stages was a discovery of young trout in Marquette Harbor on Lake Superior in 1975. Intensive sampling in the harbor with fry traps and special trawls in 1976 further revealed that the trout apparently are hatching from eggs spawned over artificial rock structures at a power plant intake and along the breakwall--the rocks providing a protective substrate. Local sportsmen have reported heavy spawning concentrations of hatchery-reared fish over these same rocky areas. In contrast, the naturally produced lake trout that have survived to the adult stage in the Apostle Islands area of western Lake Superior for a number of years are suspected of being the progeny of a remnant stock of native trout that survived the sea lamprey invasion.

Four "strains" of lake trout have been used in the stocking program on Lake Michigan: (1) the general Lake Superior strain, stocked mostly in the northern two-thirds of the lake, comprising the majority of fish planted over the years; (2) the Apostle Islands strain, released at two sites on the north-shore in 1966 and now probably expired; (3) the Manitoba (Clearwater Lake) strain stocked at scattered locations in the 1970's; and (4) the Green Lake strain, planted mostly in the southern one-third of the lake and descended mainly from fish native to southern Lake Michigan--many of which spawned on the deep, mid-lake Sheboygan Reef. The attached reports provide additional information on recent concerns about lake trout rehabilitation, with special reference to the value of the Green Lake strain as brood stock. Since the preparation of these reports, 277,000 Green Lake yearlings were released (spring 1976) on the Sheboygan Reef complex and plans have been made to monitor their performance in future years.

Even though you or your colleagues may not be acquainted with lake trout biology per se, we would appreciate any thinking that you might offer on the genetic aspects of the rehabilitation problem, including the concomitant and perhaps inseparable aspect of culturally-induced behavioral modifications in the planted fish. The following questions may help you in responding to our request, although you need not limit your response to these questions alone or even answer them directly.

1. In general, how important to reestablishing self-sustaining stocks of lake trout is the genetic constitution of the planted fish (i.e., in respect to theoretical or practical insights on gene-pool theory, etc.)?

2. Do you think that a "10%" dilution of the male parents of the present Green Lake hatchery stock with Apostle Islands fish some years ago might have seriously altered the behavior of the Green Lake fish?

3. Is a remnant stock of marked 17 to 19-year-old trout in Green Lake, Wisconsin (known descendents of Lake Michigan fish stocked in Green Lake during 1944 and earlier) potentially valuable as brood stock for repopulating the mid-lake reef complex?

4. Are the behavioral characteristics of spawning over deep water versus shallow water and over a particular substrate such as mud (see attached information on the Green Lake strain) inherited?

5. Is it probable that yearling lake trout are "imprinted" at stocking sites in Lake Michigan and later select or home to such sites as spawning adults; or is it more likely that they are "conditioned" in the hatchery to seek shallow, nearshore sites when mature?

6. If environmental conditioning or imprinting is important, at what life stage would it be most strongly acquired: i.e., fry, fingerling, subadult, etc.?

If more convenient than writing or any clarification is needed on this request, you are welcome to call me at the following numbers: 313-994-3331, Ext. 225 (FTS 378-1225). I can then return your call on FTS if cost is a problem.

Sincerely,

Edward H. Brown Jr.

Edward H. Brown, Jr.
Chairman, Lake Michigan
Lake Trout Technical
Committee

Attachments

RESEARCH PROPOSAL

David Loftus January, 1978

I am interested in doing research into historical aspects of the fish community and fisheries of Lake Huron and Georgian Bay. The little work that I have done in this field began when I undertook to interview some of the older commercial fishermen in an effort to augment existing documentation of Lake Whitefish spawning areas in these bodies of water. These gentlemen have been able to provide a great deal of interesting information. There are many with whom I have not yet spoken.

In addition to this I have begun a search through available newspaper collections for information related to fisheries. Other documentation is scarce although I have had access to one useful series of correspondence, some fishermen's logbooks and a small number of other documents.

Among the topics in which I am especially interested are changes in the fish communities of the Fishing Islands and Matchedash Sound areas, the Lake Trout fisheries of western Georgian Bay and the fisheries of the Cape Croker and Saugeen Indian Reserves.

I feel that the best approach at present is to continue to explore the information that is on hand and to continue to interview those people who gained their livlihood from the fisheries in the past. Fortunately my job provides me with some latitude in this. I would also welcome an opportunity to examine the Jesuit Relations and the Hudson's Bay Company Archives which are available on microfilm at the National Archives of Canada. Sources of information of which I have made use to date are listed on the attached sheet.

Sources of Information

1. Report and Recommendations of the Georgian Bay Fisheries Commission, 1905-1908.
2. Report of the Huron Fishing Company, 1842.
3. The Fishes of Georgian Bay, B.A. Bensley, 1915
4. The Georgian Bay, J.C. Hamilton, 1893
5. The business correspondence of John Macaulay, Booth Certified Dealer, 1935-1938.
6. The newspapers:
   - The Owen Sound Sun Times
   - The Owen Sound Comet
   - The Manitoulin Expositor
   - The Wiarton Echo
   - The Goderich Huron Signal
7. Retired fishermen:
   - Mr. Ken McLay, Stokes Bay
   - Mr. Morice Doran, Southampton
   - Mr. Jack Perks, Meaford
   - Mr. Otto Butson, Meaford
   - Mr. Samuel Mckim, Meaford
   - Mr. Joseph Akiwenzie, Cape Croker
8. Logbooks of Mr. Nathan Doran, Southampton, 1921-1960
9. Such historical works as:
   - The Bruce Beckons, Sherwood Fox, 1952
   - Georgian Bay, The Sixth Great Lake, J. Barry, 1968
   - McGregor Bay, The Quiet Paradise, L.A. Nees, 1976
   - History of the County of Bruce,

UNIVERSITY OF MINNESOTA
TWIN CITIES

College of Forestry
Department of Forest Resources
110 Green Hall
1530 N. Cleveland Avenue
St. Paul, Minnesota 55108

February 1, 1978

Mr. John Goodier
87 Major St.
Toronto, Ontario M5S 2K9

Dear Mr. Goodier:

It was most interesting to hear of you thesis research project on, "The historical transformations of lake trout stocks in the Canadian waters of Lake Superior". Your letter of Jan. 18 also contained some valuable suggestions for locating references; I had no idea that the Hudsons Bay Archives were at Winnipeg.

I can only sympathize with all the work you will be getting into in assembling all of harvest reports from 1947 and later on. After that I understand you will be contacting as many commercial fishermen as possible along the Ontario north shore.

The fishermen contacts were: Arnold Almos at Terrace Bay, Peter Dahl at Thunder Bay, and Vic Bergman at Thunder Bay. The first two quit fishing about 1950; I think Vic Bergman still fishes out of Rossport (I saw him at the Kemp Fish Co. at Thunder Bay). None of my tapes have been transcribed because of the excessive work involved- hopefully I will be able to do that by next summer and will send you a copy if interested. My objectives are entirely different from yours- I used what I call the humanistic approach(where they came from in the old country, why they left, how they got over here, and what kind of a life they had in just plain living- social & religious aspects).

I am faced with the problem of getting a list of the names and addresses of recent day fishermen so that I can make more contacts. I have found that these contacts sometimes lead to the "old timers" or the sons or daughters of these "old timers". I have written to two fish companies at Thunder Bay and from that I hope to get more names. The Ministry of Natural Resources told me they were not permitted to send out such a list. Would it be possible for you to send me such a list? I assume you already have or will have such a list inorder to make the interviews later on. The shore I am most interested in extends from Thunder Bay to Terrace Bay-I would indeed be grateful. Fortunately I have not had that problem on the U.S. side- all of the states and fish companies have cooperated fully.

I regret to report that my project is now at a standstill because of a lack of funds for travel. The support I had hoped for has not become available from the Norwegian-American Historical Association at Northfield, Minnesota. I am still trying to locate other support.

Sincerely yours,
Laurits W. Krefting
Laurits W. Krefting,
Research Associate, Emer.

P.S. If my project continues in Ontario I would be glad to ask each fisherman about former and present spawning grounds

70 Fourth Ave. West, Owen Sound,
Ont. N4K 4V2.
May 23/78

Dear John:

Please accept my apologies for being so slow to reply. Thanks for the copy of your proposal: it looks interesting and ambitious. I wish I were able to take a good solid crack at interviewing the way you will. I'm enclosing a copy of a recent interview I had with Jack Edmanstone of Tobermory. I haven't been able to have a 2nd interview with him yet and so I can't provide maps etc yet. I asked on your behalf who you might contact re. Lake Superior Fishermen - he suggests a fellow named Lynne Golden who is with M.N.R. at Sault Ste Marie (I don't know what Branch office, but if you give the District office a call they can probably tell you how to get in touch with him). Golden knows most of the people you would want to talk to & he can

at least get you started. The interviews are probably the most important source of information that you'll find, or one of them. Transcribing them takes a lot of time and don't plan on using each tape more than once on the trip. Take a camera to photograph photographs.

You'd be welcome to sit in on some interviews with me (who but as long as you're done some interviewing starting won't be that difficult and you acquire a style as you go along. It is hard to get all the answers you want the first time around. Don't overlook the Indian fisherin (I'm sure you won't) - their oral tradition is strong and some of the older ones will have a lot to say.

Wish I could be of more help. If you'd like to sit in on some interviews here, let me know and I'll arrange what I can - you'd find it interesting. When you talk to Golden, tell him that you were referred to him by Jack Edmonstone through me -

- they knew each other and Jack's name means something to him.

Good luck with your research.

Regards

Dave Lofton

Ministry of Natural Resources
Ontario

Your file:

Our file:

Fisheries Section
Fish and Wildlife Research
P.O. Box 2089
Thunder Bay, Ontario
P7B 5E7

April 24, 1978

Mr. J. Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Ontario
M5S 1A4

Dear Mr. Goodier:

I have enclosed a recent letter of mine to Dr. L. Krefting, University of Minnesota who is interested in the same subject and might be worthwhile contacting.

In addition you might try Mr. Keith Denis, 48 Oak Ave., Thunder Bay, who would probably know the disposition of A. E. Allin's notes. I doubt, however, that they deal specifically with lake trout although I may be wrong on that point. wrote May 11, 1978.

Back in 1953, I worked on Lake Superior on the Research vessel "Cisco" and recall that the crew who had commercial fishing backgrounds identified (or thought they could) several other varieties of lake trout beyond the four you mention in your thesis proposal. These included yellow-fins, blacks, silvers, pop-eyes and paper-bellies among others that I have long since forgotten. Some of these distinctions at the time seem justified on the basis of superficial morphology, discreteness of stocks, location of capture or spawning times.

Earlier on (1948 & 1949) I worked respectively in the Montreal River and Rossport regions of L. Superior and recall quite a different set of terminology including "bankers" which were alleged to have come from the Superior shoal.

As you may have guessed, most of the oldtime fishermen who would have been the best informants are long gone - particularly at Rossport, Coldwell etc. However, I think there is probably enough of the third generation left to adequately provide you with your needs.

Best of luck with your investigation.

Yours very truly,

R. A. Ryder
Research Scientist

RAR:bp

Thunder Bay Field Naturalists

P.O. Box 1073
Thunder Bay, Ontario
P7C 4X8

18 July, 1978

John Goodier
Institute of Environmental Studies
Haultain Bldg.,
University of Toronto
Toronto, Ontario.

Dear John:

Enjoyed your visit, wish my notes had been all available, and that you could have received more information.

Checked my diaries, actually just scanned them. Noted:

Murray Speirs was here in 1955 re lamprey control.

A lamprey was take at Whitefish Bay, U.S.A.(near Sault Ste. Marie, in 1946.

1958-many scarred fish.

16th Annual Fish Derby at Rossport in 1953 (Toivo Seppala was chairman) saw C. M. Thompson take first prize with a 32 lb. 11 oz trout.

There was also a thirty pounder club and on 16 Oct.,1953, Mrs. Mary Legault, age 72, gained a prominent position on it with a 40 lb lake trout she hauled in alone.

Memory is a tricky thing and I talked to a few angling friends but none kept notes. One caught a 3½ lb lake trout near Caribou Island, Thunder Bay, in 1961 with no scar. The same year I took one near Copper Island, Rossport, without a scar.

Scanned bird notes of Dr. A.E.Allin but found no notes about lake trout that provided details of exactly where caught or re spawning grounds.

Best wishes and I hope to read your thesis when it is completed.

Sincerely

K Denis

Keith Denis

N.B. Extract from lamprey article enclosed.

Keith

Fisheries and Environment Canada
Fisheries and Marine

Pêches et Environnement Canada
Pêches et Mer

Huron Street, Ship Canal P. O.
Sault Ste. Marie, Ontario P6A 1PO

January 22, 1979

Your file *Votre référence*

Our file *Notre référence*

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Canada M5S 1A4

Dear Mr. Goodier:

Thank you for your letter dated January 9, 1979. We will certainly be interested in seeing the results of your studies on stocks of native lake trout and their traditional spawning grounds. I am glad to hear that your interviews with the fishermen were fruitful.

We have heard of the reports of very early (ca.1892) sightings of "lamprey eels" in Georgian Bay as quoted by Wilmott. It is possible that a brief, local, and temporary introduction of sea lamprey occurred (possibly via bait-buckets?). However in view of later events it seems unlikely that an established population would not have resulted from a number great enough to cause noticeable evidence. It seems more probable that the reports relate to silver lamprey which are fairly common in Georgian Bay.

With regard to Doré River, we have made a number of surveys for larval sea lamprey without finding any. There is a falls near the mouth which probably stops migrating adults and may prevent successful colonization by sea lamprey.

The Ontario Ministry of Natural Resources should have all available records of scarred trout from fishing grounds in Canadian waters. Try contacting Andy Lawrie at the Maple Laboratory for the earliest records. It is our impression that lamprey are relatively scarce in offshore grounds as compared with inshore areas.

I hope you find the answers to the remaining questions.

Yours truly,

J. J. Tibbles
Director
Sea Lamprey Control Centre

JJT:al

UNIVERSITY OF MINNESOTA
TWIN CITIES

College of Forestry
Department of Forest Resources
110 Green Hall
1530 N. Cleveland Avenue
St. Paul, Minnesota 55108

Sept. 14, 1978

Mr. John Goodier
Institute for Environmental Studies
Haultain Bldg.
University of Toronto
Toronto, Ontario M5S 1A4

Dear John:

It was nice of you to telephone me this morning from the Minneapolis Bus Depot while enroute to Chicago. Your call came so unexpectedly that I couldn't think clearly as to what I wished to talk about. I wish you could have spent some time for a good discussion. But I expect that wasn't possible because you had such a tight schedule. At any rate I am glad that you took time to telephone.

The address I promised to end you is as follows: Northeast Minnesota Historical Center, University of Minnesota-Duluth, Duluth, Minnesota 55812. However, since I plan to visit the center later on this fall, I suggest that you write to me first and outline your specific interests. When I visit the center I will make an effort to locate the information for both of us.

At the office I checked the following Grace Nute reference: Nute, Grace Lee 1926. The American Fur Company fishing enterprises on Lake Superior. Miss. Valley Historical Review 12:483-503. Is this the reference you had in mind?

You also mentioned another historical reference on commercial fishing in the Canadian waters of eastern Lake Superior. John Witham sent me chapter 14 on fishing from a report.I am enclosing a photo copy of John's letter which explains it more fully. Is this the reference you had in mind?

In our conversation you also mentioned another reference but I didn't get a chance to write it down. Do you recall what it was?

Sincerely yours,
Larry Krefting
L. W. Krefting,
Research Associate, Emeritus

Dear John: I do not have a doctorate degree. At one time I almost had one, but was too busy to stop following moose trails on Isle Royale to get one. But I have no regrets.

Indian and Northern Affairs | Affaires indiennes et du Nord

Ontario Region,
Parks Canada,
P. O. Box 1359,
Cornwall, Ont. K6H 5V4
Tel. (613) 933-7951

January 17, 1978

Your file Votre référence

Our file Notre référence C 3668-1

Reply Attention: J. Witham

L. W. Krefting,
Research Associate, Emer.,
College of Forestry,
Department of Forest Resources,
110 Green Hall,
1530 N. Cleveland Ave.,
St. Paul, Minnesota.
55108

Dear L. W. Krefting:

Your very interesting letter of January 4, 1978 has been passed to me for reply. In 1976 John Marsh of Trent University, under contract to the Ontario Region of Parks Canada, prepared a Preliminary Human History of Pukaskwa National Park. The study focussed on the part of the coast line between Marathon and Michipicoten. Some early fishing was of course carried out from the fur trading posts in this area and later there was a fishing station located in the park itself. While the information in the report is far from complete, it may none the less be of interest to you. As only a very few copies of the report were originally made there are none available for distribution at this time; however, you will find enclosed a xerox copy of the relevant chapter. Hopefully, this will at least serve as a guide for you.

I noted from your letter that you refer to interviews with "three old time commercial fishermen" and would be most interested in hearing more about this. The results of your study would be of much interest. If I can be of any further assistance to you do not hesitate to write.

Sincerely yours,

John Witham

for J. C. Christakos,
Director.

Encl.

cc. A. Fraser.

Ontario Resources

Your file:

Our file:

P.O. Box 640
Geraldton, Ontario
POT 1MO

1979.01.09

Institute For Environmental Studies
University of Toronto
Toronto, Ontario
M5S 1A4

Attention Mr. John Goodier

Dear Sir:

This will acknowledge receipt of your letter of January 2nd, 1979 in which you enquired about availability of reports by Mr. A. King.

We do not have copies of the report mentioned; however, we have taken the liberty of forwarding copies of your letter to the District Managers of Terrace Bay and Nipigon. It is possible one of the above offices may be in possession of the information requested.

Yours truly,

J. K. Cleaveley, District Manager
Geraldton District
Telephone 807-854-1030

E.H.Stone/ij

c.c.: District Manager
Terrace Bay

District Manager
Nipigon

United States Department of the Interior

FISH AND WILDLIFE SERVICE

IN REPLY REFER TO:

Great Lakes Fishery Laboratory
1451 Green Road
Ann Arbor, Michigan 48105

January 22, 1979

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Ontario M5S 1A4
Canada

Dear John:

I am writing in response to your recent request for information on Lake Superior races of lake trout, and lake trout spawning grounds, and for the names of commercial fishermen and biologists that would know something about these subjects. Unfortunately, I am not able to supply you with much information. (I think Dick Ryder was sort of grasping at straws when he suggested me as a person to contact.) Most of my work has been on Lake Michigan. When our Research Vessel Cisco was in Lake Superior in 1953 (Dick and I worked together on the vessel that year) and 1959 we concerned ourselves with the different races of lake trout only to the extent that we separated fats (siscowets) from leans; and our only involvement with lake trout spawning areas was to catch spawning trout off well-known grounds at Laughing Fish Point (near Munising) and Partridge Island (near Marquette). Nearly all the Lake Superior fishermen I met are now dead.

Your best source for obtaining names of "oldtimer" fishermen would probably be Aquatic Systems Incorporated, 120 W. Ludington Avenue, Ludington, Michigan. This private organization (under contract to the Michigan Department of Natural Resources) is nearing completion of an atlas of past and present nearshore spawning grounds in Great Lakes waters of the State of Michigan. I'm not sure what species are included, but obviously the lake trout would be among them. About 200 fishermen were interviewed to obtain the data. The person in charge of the project was Mr. William Organ. I might mention that our laboratory has just begun a two-year project to compile an atlas of spawning and nursery grounds of important species in all the Great Lakes and their connecting waters.

A couple of biologists that have had considerable experience with Lake Superior lake trout are:

Mr. Russell Daly
Assistant Area Supervisor
Department of Natural Resources
P. O. Box 358
Oshkosh, Wisconsin 54901
Tel: 414-424-1340

and

Mr. George King
District Fish Manager
Dept. of Natural Resources
P. O. Box 589
Bayfield, Wisconsin
Tel: 715-779-3346

I am enclosing several reprints that may be of interest to you. I hope I have been of some help. Please contact me if you need anything further.

Sincerely,

LaRue Wells
Project Leader, Lake Michigan
Fish Pop. Assessment

Enclosures

AQUATIC SYSTEMS, INC.
ENVIRONMENTAL TESTING

120 WEST LUDINGTON AVENUE
LUDINGTON, MICHIGAN 49431
PHONE 616-843-3372

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Haultain Bldg.
Toronto, Ontario M5S-1A4
Canada

February 12, 1979

Dear John:

Please find enclosed copies of our transcripts of interviews with the Isle Royale fishermen. Unfortunately, we were able to obtain only 2 interviews, but I hope that they will help you a bit.

Just a few comments on these individuals: Milford Johnson is the neighbor of Dr. Janke (Botanist) of Michigan Technological University. Dr. Janke is an ex-professor of mine and you may use my name - it may help to open doors. Who knows? Mr. Johnson's wife also fishes with him and is Stanley Silvertson's sister. Both Mr and Mrs. Johnson fish from a rowboat.

Stanley Silvertson operates a large fishery from Isle Royale and poses-ses a great deal of information and literature in files that he keeps. He is an extremely suspicious individual, and will not even speak to anyone who mentions the Department of Natural Resources. He is, however, interested in individuals who are trying to help the fisherman and if you can gain his trust he will talk for hours.

Would you please send me some specific information on the meetings you mentioned. I am going to make an attempt to attend. I'd like to try and schedule a couple of extra days after the meetings to get up to Maple.

Hope that the meeting on Thursday was profitable for you. I learned a lot from your information and am still trying to sort things out.

Sincerely,

Mark O. Walter

Mark O. Walter

Fished since 1906.

Lake trout: From up here atWashington Harbor down to McCormicks Reef and all the way to end of Scooner Island. 75% of the fish that spawn at Isle Royale spawn here. Plus this bay for late spawners in Nov. But in Oct, and Sept, (mostly Oct.) North side is too steep, not too many reefs. But are some, like Five Finger and around the end of the island.

Reefs that are exceptionally good: From Long Point down here, all along this shore, from Fisherman's Home to the head. (on map). Depth: 48- 90 feet. The best is from here all the way down here to Scooner ~~Ilan~~ Island and all thru the bay. The water depth is correct for them. Bottom: rocky and inbetween the shoals and ridges is moss, quite a bit of it. Native lake trout. No finclips at all. When fishes over at Crystal Cove across from Belle Isle, (Canadian shoreline) gets a few (about 1%) finclips.
Spawn: First of Oct. on out about Nov. 10. Later spawners in lake: up to the 20th of Nov. Different species, ~~Mackinaw-trout~~, Dad uased to call them the Channel [illegible], (they are the later spawners) . Smokies, ~~follow-the-Channel-Trs~~, just before the Channel [illegible]s come in in Nov. also. The earliest fish is called redfins.
They always spawn in the same area: Lake trout.
Some years were better than others. Most of the large trout, stay out in the lake except when spawning season. Come from all over the lake back to the spawning areas.
Spawn in the evening. Weather: heavy blow will take them off the reef for a day or so. Ratio is about the same. The mature fish are doing well on their own since the lamprey kill, they are bigger and better every year. Coming back on their own.
Other areas. From Big Todd Harbor and even Little Todd Harbor, they spawn. And down to Blake's Point.
Big area is marked A on the map.

Whitefish: MaCargo Cove, north side of the island. On the mouth of MaCargo, right out around these points. (on map) Point B.
Also, Ciscowet Bay, up here in Hay [illegible] Bay around these points.
Also in these reefs here by these bouys. (Hasn't fished that)
Reefs in here at Wright Island. Around Dodin Reef, Demon[illegible]n (sp), Point E. (on map).
Further east; just past Scooner Island, around the end.
Spawn: in the fall, last of Oct, to first of Nov.. Nothing until about the 25th of Oct. Always spawned there since he's been fishing. Right kind of current for spawning, an eddy that will spin where they lay their eggs, otherwise the eggs will just lump, they have to move. They only spawn on these type of reefs. Bottom: rocky, gravel. Depth: 6-8 feet of water. Right up on the beach. Time of day: From evening till midnight. From 9 to 12 is the best. Better have good weather. 25 per mile hour wind, the fish will be gone. Ratio is equal.

Herring: Fished a few this last spring to see if they were still around. They were, up at Maylight at Nayco (?) Cove. Large herring.
Years ago: this bay here was about the only suitable place for them to spawn. In Cisco Bay. Depth: ~~48-300-feet~~. 48-90 feet. Fished out there when the lamprey kill came. Spawn: Not before the [illegible]th of Nov. till Christmas. Fished there as long as he has been [illegible]hing. Bottom: sandy .

Index No. Name: Milford Johnson Tape No.: MPR-11

Herring, con't: Weather: good blow from the NE and they would have to move out, but thats about all. Not sure of spawning time of day. Ratio is now evened up.

Lampreys have leveled off now. Still some fresh scars. Not all gone but probably never will be.

Siscowet Lake Trout: Spawned down in 50 and 60 fathoms of water. Numbers increasing. May be found down as fas as in 500 and 600 feet of water. Generally spawn around the middle of November.

Area A: Redfin's found in 300 feet on up to the surface. Spawn in 4, 5, and 6 feet of water. Lake Trout and Mackinac trout spawn in 30 to 40 feet of water, around the same area but out deeper. Labeled Area B. Come in around the 20th of Sept. Regular Lake Trout around the 20th of October. McCormick's reef and McCormick's rocks. Used to be called the Fedfin Reef. McCormick's Reef labeled C. and McCormicks Rocks labeled D. Spawn all along here, mostly between 30 feet and shallow water. This area labeled Area E. Located out from McCormick's reef and rocks. Redfin area bottom type. Cobblestones and flat rock. Spawn around dusk. Weather influences spawning. Temp. of H2
Rock of Ages Trout: Labeled F: Spawn in the latter part of Sept. Reef is cliff and ledges, with drop-offs. Are mixed up with other types of trout today. Spawn around the latter part of September. These look like a spectrum without red spots. Some are still around. This area ~~might be~~ called Cumberland Reef. (?)

Salmon Trout: Spawn around section labeled G. Spawn in the moss. Other names are: Channel Trout or Gray Trout. Depth: 15 to 40 feet. Spawn around the 20th of October. In ripe condition. Some at Rock Harbor.
Area H: Spawning all along through this area.
Area I: Finlander Reef
Area J: Thompsonite Beach
Area K: Just in from Gold Rocks
Area L: End of little Todd Harbor
Area M: Along Citsco Islands
Area N: (?)(Index no 110)

Whitefish: Spawn around the 1st of November until the 15th. Males come in first. Areas are around: Little Island Reef, Missisinger's Point, North of Green Island, Sand Point, Center Point, and some are found in Citsco Bay.
Whitefish have always spawned here and still do. Spawn where there is a current. Bottom type: Boulders and different sized gravel and flat rock. Seem to spawn when the water is a little turbulent and if it's a little stormy.

UNIVERSITY OF MINNESOTA
TWIN CITIES

College of Forestry
Department of Forest Resources
110 Green Hall
1530 North Cleveland Avenue
St. Paul, Minnesota 55108

March 15, 1979

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Canada M5S 1A4

Dear Mr. Goodier:

Your letter to Mr. Krefting was forwarded to me as a coworker of his for many years. I regret to tell you that Larry died unexpectedly last November.

You refer to his study of the history of Lake Superior fishing which developed as an outgrowth of his study of the origins of many of these early settlers from Norway. I am in the process of advising his family on the disposition of his records (which are considerable and valuable). While it is not yet arranged, they will probably go to the University of Minnesota archives for widest availability to others interested seriously in the subject.

I do not know enough about your own project interests to know if I can be of any help. I shared a number of subjects mutually with Larry and if you feel I can advise you, please contact me further.

Sincerely,

Henry L. Hansen

Henry L. Hansen
Professor

HLH/pjn

1011 Beach Drive,
Nanaimo, B. C.
V9S 2Y4

March 29, 1979

Mr. John Goodies,
Institute for Environmental Studies,
University of Toronto,
Toronto, Canada
M5S 1A4

Dear Mr. Goodies,

I have your letter of March 8, 1979. Please note that I retired from Government Service at the end of 1976.

I have heard the question of whether lake trout flesh colour is hereditary or environment-related debated repeatedly since I was a student in the 1930's. Actually, one can find every possible shade of colour from deep red to white, and from brilliant yellow to white, with shades between yellow and red as well. It has, therefore, been long recognized that a satisfactory answer would require a lengthy and very sophisticated study, which no one has so far undertaken. My own feeling is that genetics determine flesh colour, but that manifestation of the genetic factors is influenced by environmental factors, including diet (we are what we eat), spawning (it uses energy stored as fat), and perhaps other factors. Environmental factors can probably change flesh colour by enough that flesh colour must be regarded as an unreliable indicator of racial differences.

The above may also apply to fatness. However, the relationship between fatness and habitat does seem more pronounced among Lake Superior lake trout than within any other population of lake trout known to me.

Fish that can see, voluntarily contract or expand pigment cells in the skin to alter their appearance, usually to make their appearance more like that of the environment. Thus, while skin colour is probably genetically determined in a sense, it is influenced by the environment and of doubtful use in racial studies.

On specific questions: Diet and spawning are both environmental factors likely to influence flesh colour. Flesh colour varies considerably among the trout of Great Slave Lake; I have not discerned a pattern. I have not noticed a yearly pattern in body coloration. My only comment on fatness is that there is noticeable variation in fatness within several lake trout populations.

Yours sincerely,

W A Kennedy

W. A. Kennedy

March 19, 1979

752 Westminster Ave.

Winnipeg Man. R3G 1A5

Dear John:

Glad to hear of your research. When the report was submitted, there was only one copy of the photos(volumes 3,4, and 5). I believe I prepared two sets of the maps - Vol.2). The photos remained at Lake Superior Park, so if you saw vol. 3 in Toronto, the Head Office must have had it on loan. I believe a copy of vol. 2 was deposited with Toronto. At any rate, a complete set is supposed to be at the Red Rock Office of the Lake Superior Prov. Park.(Contact Ian Seddon, Naturalist).

The Agawa Bay Diary is on file with the Sault Ste. Marie Public Library in their Canadiana Collection. Contact Mrs. Kay Punch. The Diary is rather uniform in character and you may not get too much out of it - a nice period piece however. The Interview tapes should also be with Ian Seddon.

You might be interested to know that I have just submitted the bound versions of an M.A. thesis to the Univ. of Waterloo History Dept. - The Saulteur-Ojibwa Fishery at Sault Ste Marie, 1640-1920. This deals largely with the whitefish but some of it might be of interest in terms of source material.

It probably will not be in the library yet, but Prof. Palmer Patterson was the advisor. Wayne MacCallum(74 Pine St. Sault Ste Marie) is a fisheries biologist and might be a usefull contact if you are in the Sault. He gets to Michipicoten Island sometimes. Good Luck.

Yours sincerely,

Graham MacDonald

april 27. 1979

mr. John Loodies.
Institute for Environmental studies
University of Toronto M5S 1A4

apartado Postal 1169
Cuernavaca. morelos
mexico.

Dear John:-

Sorry to be so late in answering your February 9 letter. was in the hospital with a ruptured gall bladder for nearly a month. then sort of on the shelf for another month after discharge from the hospital, so have been working my way down through the accumulated mail.

Now for your questions re Lake Superior Lake Trout.

as far as I know the Blacks were the only Lake Trout that spawned in the rivers.

They always had yellow fins and red coloured flesh.

The largest Black or Yellow fin that I saw was 42 pounds and was caught at Rossport. as we fished these Blacks for sport and used light fly rods. we could never land the larger fish. largest we landed on our light Tackle was 18 pounds. as for as I know the size did not vary with the rivers. They would weigh from 3 or 4 pounds on up, I would say that the average weight of the Blacks we would take on light tackle were between 6 to 10 pounds, few smaller, few larger.

The Commercial fishermen informed me that they would start to Catch Blacks in very deep water in August as they started moving in to shore, never having seen a deep water. Net Caught Black I could not say if there fins would be yellow or not at that stage

The yellowfinned Lake Trout found spawning among the islands off Rossport in November would be the same trout as those we Caught in the rivers in september and October

The rivers that I mentioned having a Black Trout spawning run was the steel, Puckaskwa, Dog and montreal, white Gravel.

usualy we would not look for Blacks untill after september 15 when the speckled Trout season closed. a few times we would Catch one in early september.

There could be many more streams into which these fish

went to spawn, but no one would know about them.

These Block trout were about finished by 1954-55. The Department of Lands and Forests had been meting and taging at Dog Rivers for a number of years, but they became so few that they moved there taging operations to the Pukaskwa Rivers about 1953 or 54. but by then there was so few fish that they gave up the progect. However, my understanding is that the last years Catch were flown in to Mishibishu Lake, where they hoped to keep the species alive for eventual re-stocking in Lake Superior when the lamprey ele was under control. This you might obtain information on from the Department of Natural Resources.

The Grey or Silver Lake Trout were a different species. very seldom over 8 pounds, flesh almost white, good eating. Could be caught along shore all summer. some in-land lakes such as Killala had these Silver Trout. also Brooms.

I do not know when the Greys spawned, but I would presume it would be in the Fall like most other Lake Trout.

The only Lot Trout I have seen were taken by nets. and in summer. only the Commercial fisherman could tell you the dates when they were usualy Caught

I do not know of Cisco runing into the rivers.

Hope the above information is not to late to be of use

Sincerly

Colin MacMillan.

University of Minnesota

Office of Director
132a Hodson Hall
1980 Folwell Avenue
St. Paul, Minnesota 55108

Sea Grant Extension Program
109 Washburn Hall
University of Minnesota, Duluth
Duluth, Minnesota 55812

Sea Grant Program

May 4, 1979

John Goodier
Institute for Environmental Studies
Houltain Building
University of Toronto
Toronto, Ontario, Canada

Dear John:

The title of the conference proceedings I mentioned is: Norwegian Influence on the Upper Midwest, Harold Saess, ed. It is available for $6.50 from Continuing Education and Extension, 403 Administration Bldg. University of Minnesota, Duluth, Duluth, MN 55812. The paper is entitled, "Norwegian Immigration and the Development of Commercial Fishing along the North Shore of Lake Superior, 1879-1895." I doubt it has much specific information of use to you, but it may have a clue or two and, if nothing else, perhaps the citations may provide leads.

I mentioned Claude Ver Duin (pronounced Ver Dīne) He is editor/publisher of The Fisherman, Marine Publishing Co., PO Box 5658, Grand Haven, MI 49417 (616) 842-2440. He's been a spokeman for the industry for many, many years.

Another person on the business side of the industry (as opposed to the fishermen themselves) is Roy Jensen of Escanaba, MI. He's retired Secretary of the Michigan Fish Producers Association and comes from an old family in the processor/distributor side of things. He might have a lead or two.

Frank Prothero is collecting historical information for another book. How much he knows about Booth operations up this way, I don't know. He is Editor/Publisher of The Great Lakes Fisherman, NanSea Publications, Port Stanley Ontario, NOL 2AO.

If you have time, you might consider running a plea for information on the Booth Co. in the above publication plus the following:

Lake Log Chips, Gary L. Bailey, editor, Center for Archival Collections, University Library, Bowling Green State University, Bowling Green, Ohio, 43403 (419) 372-2411.

Inland Seas, Janet Coe Sanborn, editor, Great Lakes Historical Society, 2237 Westminister Road, Cleveland, Ohio, 44118.

Another publication that could possibly help is: Commercial Fishing on Isle Royale, 1800-1967 by Lawrence Rakestraw, published by the Isle Royale Natural History Association, 1968. I think you can buy it for a dollar or two from the National Park Service office at Houghton, MI.

The article in Minnesota History that I mentioned I couldn't track down at the minute. I'll be at the library sometime soon and plan to look it up for you. If it seems to have anything of use to you, I'll either photocopy it or give you the title and address.

Best of luck.

Sincerely yours,

Ryck Lydecker
Marine Information Coordinator

jz

Ministry of Natural Resources
Ontario

Your file:

Our file:

P.O. Box 1160
Wawa, Ontario
P0S 1K0

October 12, 1979

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Ontario
M5S 1A4

Dear John:

We are glad to hear that your thesis is progressing well, and hope that we can be of further assistance.

Unfortunately we do not have a report which deals directly with the downstream effects of hydroelectric power generation on the Michipicoten River spawning grounds. The report by M.E. MacCallum which you are perhaps referring to deals predominantly with the effects of waterdrawdowns on the reservoirs above the river itself.

In October, 1977 Conservation Officer D. Dorey observed fin-clipped lake trout caught at Scott Falls on the Michipicoten River. Their reproductive state unfortunately was not noted. On November 2, 1976 two male lake trout were netted by our staff in the Michipicoten River at its confluence with the Mission Bay (Magpie River). Both of these fish were ripe, possessed fin clips (Ad, LV-1972), and measured 22.2 and 21.2 inches, total length. On October 1, 1979 one of our staff angled a fully developed male lake trout at the base of Silver Falls on the Magpie River in the Mission. It possessed a left pectoral (1974) fin clip. A number of anglers reported catching lake trout in this location.

We have been unable to carry out any further observations on the University River, since 1977. We do not have any other confirmed reports of lake trout spawning runs, but strongly suspect one to be occurring in the Montreal River.

Our records indicate that only trout derived from the University River were planted in Mishibishu Lake. There still remains some question as to whether or not the 1963 plant involved fish derived from Lake Superior shoal spawners. We are unaware of any plant involving Wolf River fish.

If you require any further information please feel free to contact us again.

Yours truly

E.R. Thomas

for H.A.Orr, Outdoor Recreation Supervisor
Wawa District

NORTHERN MICHIGAN UNIVERSITY
Marquette, Michigan 49855

DEPARTMENT OF BIOLOGY
(906) 227-2310

24 October 1979

Mr. John Goodier
Institute for Environmental Studies
University of Toronto
Toronto, Canada
M5S 1A1

Dear John,

Thank you for your letter of 17 September 1979. I am happy to hear of your work with lake trout stocks. Indeed, it is work which definitely is long overdue. I would be interested in your results when completed. Enclosed is a copy of my proposal as you requested. Also enclosed are other materials I thought might be helpful to you.

The Isle Royale reference (Rakestraw, 1968) has one of the best prints I have been able to find describing specific subpopulations of lake trout from any one area. The other articles describe subpopulations of lake trout in general, although give no details.

From preliminary examinations, the electrophoretic data from my studies indicate lake trout from Lake Superior do indeed consist of discrete stocks. There are also genetic differences between different areas as well as between morphological types within one area (leans, humpers, siscowets). However, overall similarity (I) is near 1, with 1.0 being total similarity.

The data must be examined more closely for more conclusions to be reached. I am approximately in the same stage as you in reguard to writing a thesis, so I'm sure can relate. If I should uncover any useful information, I shall forward it to you. Please do not hesitate to ask if I may be of further service to you.

Sincerely,

Terrence R. Dehring

John Goodier:

Re: "Rum Runners"
"Lamprey Discovery on Lake Erie"

Both written by my father Lloyd E. Crowe
Now in the possession of Mr. Frank Prothero
of Port Stanley.

Permission granted to make copies if you wish.

Please remind Mr. Prothero I would like these articles returned as soon as possible.

If Mr Prothero consents to lend these articles to you, you have my approval on condition they are returned to me promptly.

John Crowe

1978 Notes Mr. Brown
Port Arthur

Big Trout -

Rosport fish derby
Mart MacDonald got 42
pound -
Early fisherman got a
65 pounder off Apostle Is.

Lake Superior Salmon trout
better than B.C. Salmon.
In fall of year when the big
ones came in they used to
cut them up and pickle them.

1915 I got a Keg from one of my
friends on Fort Wm Indian Reserve
3 that weighed about 35 pound each
were brought up to Fall Exhibition

Nipigon River early fishing
written up in Lakehead Living
on information obtained at ~~Thunder~~
Historical Society by Patricia Forrest.

"Booth dock was Headquarters
of business at Lakehead. The Booth
company had a steamer call here
3 times a week to pick up
fish brought there by ~~fish~~ tugs
and 2 masted sail boats with an
extra width. These were known
as Mackinaw boats.

Ontario

Office of the
Deputy Minister

Ministry of
Natural
Resources

Whitney Block
Queen's Park
Toronto Ontario

1979 05 22

Mr. John Goodier,
Institute for Environmental Studies,
University of Toronto,
Toronto, Ontario
M5S 1A4

Dear Mr. Goodier:

I am replying to your letter of March 18th, 1979 (received in my office April 25th) in which you requested permission to use certain archival material originating in the Ministry of Natural Resources. We have now been able to identify all of the files which you listed and you have my permission to access them on whatever basis you can work out with the office of the archivist.

I am sending him a copy of this letter together with yours of March 18th, 1979, so that he will know specifically which files are covered under the above permission.

J. K. Reynolds,
Deputy Minister.

c.c. Archivist of Ontario
Mr. L. Eckel