

Great Lakes Fishery Commission
Research Completion Report

GREAT LAKES LAKE TROUT RESEARCH INVENTORY

Compiled by

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Illinois State Geological Survey
Champaign, Illinois

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INTRODUCTION

This inventory was compiled under contract with the Great Lakes Fishery Commission. The information on research projects was obtained from questionnaires sent to approximately 400 research scientists and organizations around the Great Lakes in U.S. and Canada. Additional information was obtained from the latest National Sea Grant College proposal volumes and telephone conversations with individuals. The inventory covers lake trout research and monitoring projects completed in 1985-87 and ongoing (with the exception of a few completed in 1983 or 1984 with results yet unpublished). Most projects are on one of the Great Lakes or are laboratory studies with Great Lakes stock; however, a few projects listed are on various Canadian lakes and other U.S. lakes (see area index). The inventory focuses on research projects and does not include all strictly monitoring or surveillance activity which might encompass lake trout.

The listing is alphabetized by investigator, with indexes given for subject (keywords), area, and investigator. Each project listing includes main investigators, their affiliations, project title, starting and completion dates (if known), sponsor (if known), area of lake studied, keywords, and project description (if available).

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 1

ADELMAN, I.R.; WARTHESEN, J.J.

Minnesota - University of Minnesota, St. Paul
Department of Fisheries and Wildlife;
Minnesota - University of Minnesota, St. Paul
Department of Food Science and Nutrition

INFLUENCE OF DIETARY THIAMINASE ON LAKE TROUT REPRODUCTION

Starting date: 1/1987

Completion date: 9/30/1989

* means that date is uncertain

Project no.: R/F-18

Sponsor: Minnesota Sea Grant College Program

Area: Lake Superior; Laboratory

Keywords:

alewife, fish strains, diet, fish, reproduction, bioassay,
enzymes, smelt, nutrition, populations, seasonal,
physiology, forage base, spawning, lake trout, biology

Description:

OBJECTIVES:

To determine (1) under laboratory conditions if diets containing smelt or alewives will affect lake trout reproductive success; (2) internal distribution of thiaminase in smelt (viscera or muscle) and the seasonality of its presence; and (3) if lake trout from successful reproducing and nonreproducing populations show differences in thiamine nutritional status during spawning season.

METHODOLOGY:

Thiaminase containing raw, frozen fish will be fed to lake trout to determine effects on reproduction. Smelt and alewives captured at different times of the year will be analyzed for thiaminase activity to determine seasonality. Activity of thiaminase in food on dietary thiamine levels will be determined in food recovered from the gastrointestinal tract. Thiamine nutritional status of field-caught lake trout will be determined by the transketolase assay.

RATIONALE:

Forage species, which now constitute a large portion of the lake trout's diet, contain the thiamine-destroying enzyme, thiaminase. The thiaminase causes a low-grade thiamine deficiency in lake trout, which in turn impairs reproductive success and prevents or delays the establishment of self-sustaining lake trout populations.

Contact:

Dr. Ira R. Adelman
Department of Fisheries and Wildlife
University of Minnesota
St. Paul MN 55114

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 2

ARGYLE, R.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

SURVEILLANCE AND STATUS OF FISH POPULATIONS IN LAKE HURON

Starting date: 06/1973

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Huron

Keywords:

biology, fish, lake trout, populations, monitoring, abundance, distribution, growth, mortality, diet, whitefish, forage base, sea lamprey wounding, management, rehabilitation, bloater chub, sport fishing, predation

Description:

OBJECTIVES:

To (1) determine the abundance, distribution, size/age composition, growth, mortality, maturity, diet, etc. for lake trout, chubs, whitefish, and prey fish; (2) determine the degree of success of sea lamprey control and lake trout rehabilitation programs; (3) evaluate the impact of fisheries and effectiveness of present regulations; 4.) develop new interagency management plans; (5) predict Total Allowable Catches for chub, lake trout, and whitefish, especially in treaty-ceded waters; and (6) determine the capacity of prey-fish stocks to sustain present or increased levels of salmonid predation.

Contact:

R. Argyle

U.S. Fish and Wildlife Service

National Fisheries Center--Great Lakes

1451 Green Road

Ann Arbor, MI 48105

(313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 3

BALL, H.; MOMOT, W.T.

Ontario - Lakehead University, Thunder Bay
Department of Biology

EXPERIMENTAL LAKE TROUT ANGLING ON SQUEERS LAKE, ONTARIO

Starting date: 1982

Completion date: 1990

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Nat. Res., Quetico-Mille Lacs
Assess. Unit

Area: Squeers Lake

Keywords:

biology, fish, lake trout, sport fishing, model,
mortality, populations, management

Description:

OBJECTIVES:

To build (1) an empirical relationship between
angling effort and fishing mortality on an
inland lake lake trout population--angling is
controlled lottery; and (2) a model for management
of small lake trout lakes.

Contact:

Dr. Helen Ball
Department of Biology
Lakehead University
Thunder Bay, ON P7B 5E1
(807) 345-2121

Ref. no. 4

BEAMISH, F.W.H.

Ontario - University of Guelph, Guelph
Department of Zoology
College of Biological Science

GROWTH OF LAKE TROUT IN RELATION TO AMBIENT AMMONIA

Starting date: 1985

Completion date: 1987

* means that date is uncertain

Project no.:

Sponsor: Natural Sciences and Engineering Research Council
of Canada

Area: Laboratory

Keywords:

biology, fish, lake trout, growth, ammonia, survival,
aquaculture

Description:

Rearing protocol to enhance survival of stocked fish.

Contact:

Dr. F. W. H. Beamish
College of Biological Science
Department of Zoology
University of Guelph
Guelph, ON N1G 2W1
(519) 824-4120

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 5

BEAMISH, F.W.H.
Ontario - University of Guelph, Guelph
Department of Zoology

DIET, METABOLISM, AND SWIMMING PERFORMANCE OF LAKE TROUT

Starting date: 1985

Completion date: 1987

* means that date is uncertain

Project no.:

Sponsor: Natural Sciences and Engineering Research Council
of Canada

Area: Laboratory

Keywords:

biology, fish, lake trout, metabolism, diet, survival,
predation, aquaculture

Description:

Rearing protocol to enhance survival of stocked fish.

Contact:

Dr. F. W. H. Beamish
College of Biological Science
Department of Zoology
University of Guelph
Guelph, ON N1G 2W1
(519) 824-4120

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 6

BERGSTEDT, R.A.

Michigan - U.S. Fish and Wildlife Service, Millersburg
Hammond Bay Biological Station;
Wisconsin - U.S. Fish and Wildlife Service, La Crosse
National Fisheries Research Center

ASSESSMENT OF LAKE TROUT MORTALITY USING VIDEO SURVEY
TECHNIQUES

Starting date: 10/1986
Completion date: 02/1989
* means that date is uncertain
Project no.:
Sponsor: U.S. Fish Wildl. Serv., Great Lakes Fish. Comm.

Area: Lake Huron; Hammond Bay

Keywords:
biology, fish, lake trout, mortality, remote sensing

Description:
Initial approach will be a statistical evaluation of the line-transect approach for estimating the density of objects with an underwater video camera. Estimates of the densities of objects in study plots in Hammond Bay will be compared to their known densities.

Contact:
Roger A. Bergstedt
U.S. Fish and Wildlife Service
Hammond Bay Biological Station
RFD 441
Millersburg, MI 49759
(517) 734-2511

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 7

BINKOWSKI, F.P.

Wisconsin - University of Wisconsin-Milwaukee
Center for Great Lakes Studies

SPAWNING INDUCTION OF LAKE TROUT AND ANALYSIS OF
REPRODUCTION HORMONE LEVELS IN LAKE TROUT BLOOD

Starting date: 10/01/1985

Completion date: 8/31/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Laboratory

Keywords:

biology, fish, lake trout, reproduction, spawning,
hormones, physiology

Description:

The primary objective was to develop induced spawning procedures by testing several exogenous hormonal substances (hypothalamic and pituitary) on lake trout. A second objective was to examine the reproductive traits and physiological condition of spawning fish and compare these reproductive characteristics between native and stocked populations. Fish administered hormones (LHRHa and combination SG-G100 and LHRHa) exhibited 100% ovulatory response by the end of the study. The control group (saline injected) had a 70% ovulatory response. Hormonally induced spawning of lake trout is feasible and LHRHa produced the best response at a dose of 0.1 mg/Kg of body weight. No significant difference was observed in the reproductive traits and physiological condition between native and stocked lake trout.

Contact:

Fred Binkowski
Center for Great Lakes Studies
600 E. Greenfield Ave.
University of Wisconsin
Milwaukee, WI 53204
(414) 224-3021

Ref. no. 8

BISHOP, R.

Wisconsin - University of Wisconsin, Madison
Agricultural Economics

ECONOMIC ANALYSIS FOR MANAGEMENT OF THE GREEN BAY FISHERIES
AND OTHER GREAT LAKE FISHERIES OF WISCONSIN

Starting date: 9/01/1983
Completion date: 8/31/1986
* means that date is uncertain
Project no.: R/PS-32
Sponsor: Wisconsin Sea Grant

Area: Green Bay; Lake Michigan

Keywords:

biology, allocation, management, economics, fish, model,
lake trout, yellow perch, walleye, commercial fishing,
sport fishing, recreation, rehabilitation

Description:

OBJECTIVES:

To (1) complete an economic analysis of alternative management policies for Green Bay yellow perch in an investment framework; (2) apply the same type of analysis developed under objective 1 to Green Bay walleye management; and (3) analyze data on Great Lakes commercial and recreational fishing in order to provide relevant information to public agencies and interest groups with particular emphasis on lake trout policies.

METHODOLOGY:

A conceptual framework drawn from investment theory as applied to fisheries. Development of recreational fishing values using contingent valuation and travel cost models and of commercial fishing analyses using standard cost and return techniques.

RATIONALE:

To provide economic analyses of policy alternatives affecting productivity of Green Bay perch and walleye stock, allocation of harvest between sports and commercial fishing, allocation of walleye hatchery capacity between Green Bay and inland waters, and lake trout rehabilitation efforts so that both economic and biological effects can be considered in making public decisions.

Contact:

Dr. Richard Bishop
Department of Agricultural Economics
University of Wisconsin
Madison, WI 53706

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 9

BISHOP, R.

Wisconsin - University of Wisconsin, Madison
Agricultural Economics

ECONOMIC ANALYSIS OF LAKE TROUT MANAGEMENT

Starting date: 9/01/1986

Completion date: 8/31/1988

* means that date is uncertain

Project no.: R/PS-33

Sponsor: Wisconsin Sea Grant Institute

Area: Lake Michigan

Keywords:

economics, fish, lake trout, management, salmonid,
sport fishing, rehabilitation, commercial fishing

Description:

OBJECTIVES:

To (1) estimate the economic gains and losses from several possible lake trout management strategies; (2) assess the impact of enforcement costs and illegal activity on the workability of these strategies; and (3) further develop the theory of existence values and the methodology for estimating the existence values associated with reestablishing self-sustaining lake trout stocks.

METHODOLOGY:

Analysis via an investment framework developed by the P.I.; management strategies developed in consultation with biologists, agency personnel and user groups; data to evaluate scenarios gathered from surveys of user groups and government sources.

RATIONALE:

Extensive efforts to reestablish self-sustaining lake trout populations in Lake Michigan have failed. Major decisions are in offing regarding continuation of this effort, as costs may be large both in terms of out-of-pocket expenditures and restrictions on sport and commercial fishing. An economic evaluation of alternatives will facilitate the decision process.

Contact:

Dr. Richard Bishop
Department of Agricultural Economics
University of Wisconsin
Madison, WI 53706
(608) 262-8966

Ref. no. 10

BLACK, J.

New York - Roswell Memorial Institute, Buffalo

FISH TUMOR GUIDE

Starting date: 10/1984

Completion date: 09/1986

* means that date is uncertain

Project no.: EPA04-0265

Sponsor: U.S. Environmental Protection Agency

Area: Lake Michigan; Lake Erie; Lake Huron; Lake Superior;
Lake Ontario

Keywords:

biology, fish, lake trout, physiology, pathology

Description:

The purpose of this project is to develop a guide to identifying various tumors found in Great Lakes fish. This guide should be published by the Great Lakes Fishery Commission in summer 1987.

Contact:

Dr. John Black
Roswell Memorial Institute
Buffalo, NY 14263
(716) 845-3350

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 11

BOWEN, C.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

OCCURRENCE AND DISTRIBUTION OF WILD (LAKE-PRODUCED)
LAKE TROUT IN LAKE HURON

Starting date: 10/1983

Completion date: Continuing

* means that date is uncertain

Project no.: 980.3007

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Huron

Keywords:

biology, fish, lake trout, distribution, populations,
reproduction, rehabilitation, management, growth

Description:

Since 1973 about one million hatchery-reared lake trout have been stocked annually in Lake Huron but until recently there was no evidence of in-lake reproduction. In 1983, several lake-produced yearling lake trout were captured in the Rockport area and several young-of-the-year were taken in 1984 in Thunder Bay. Documentation of the occurrence and extent of natural reproduction is essential to support and further state/federal/provincial efforts toward lake trout rehabilitation management, stocking rates, etc. We intend to systematically sample with trawls, targeting on young lake trout, to determine occurrence, distribution, and growth of lake-produced fish.

Contact:

C. Bowen
U.S. Fish and Wildlife Service
National Fisheries Center--Great Lakes
1451 Green Road
Ann Arbor, MI 48105
(313) 994-3331

Ref. no. 12

BOWSER, P.R.

New York - Cornell University, Ithaca
Veterinary Medicine

IMPROVED DIAGNOSTIC METHODOLOGY FOR DISEASES OF SALMONIDS

Starting date: 01/01/1987

Completion date: 12/31/1989

* means that date is uncertain

Project no.: R/F-46

Sponsor: New York Sea Grant Institute

Area: Lake Erie; Great Lakes Basin

Keywords:

biology, fish, lake trout, salmonid, pathology,
bacteria, aquaculture

Description:

OBJECTIVES:

To (1) identify major serologic groups from *Renibacterium salmoninarium* isolates from the Great Lakes region; (2) develop monoclonal antibody systems to antigenic cellular components common to major serologic groups of *R. salmoninarium*; and (3) develop a monoclonal antibody-based elisa test for *R. salmoninarium* and compare it with currently used methods for detecting this pathogen.

RATIONALE:

This project will result in a specific, sensitive diagnostic procedure for bacterial kidney disease in salmonids including lake trout. This will be a useful tool in further research on this disease and will be helpful in reducing losses to BKD experienced by salmon culturists.

Contact:

Dr. Paul R. Bowser
Department of Avian and Aquatic Animal Medicine
New York State College of Veterinary Medicine
Cornell University
Ithaca, NY 14853
(607) 256-5454 ext. 2365

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 13

BRANDT, S.B.

New York - State University College, Oswego
University Research Center

TROPHIC INTERACTIONS OF LAKE ONTARIO FISHES AND THEIR
IMPLICATIONS FOR MULTISPECIES SPORT FISHERIES MANAGEMENT

Starting date: 01/01/1981

Completion date: 03/31/1987

* means that date is uncertain

Project no.: R/F-19

Sponsor: New York Sea Grant Institute

Area: Lake Ontario

Keywords:

biology, fish, lake trout, sport fishing, management,
diet, habitat, alewife, smelt, slimy sculpin, model,
bioenergetics, predation, competition, populations,
temperature, salmonid, forage base, chinook salmon,
coho salmon, brown trout, rainbow trout

Description:

OBJECTIVES:

To (1) compare the diet and habitat of the alewife, smelt, and slimy sculpin in Lake Ontario, particularly near sharp thermal fronts; (2) determine the food and habitat requirements of Lake Ontario salmonids using bioenergetics modeling; and (3) assess potential predator-prey and competitive species interactions and their impact on population dynamics of Lake Ontario fishes.

RATIONALE:

By providing baseline information of trophic interactions of salmonids and their forage base in Lake Ontario, this project will support the on-going salmonid stocking program and the revitalization of the lake's cool- and warmwater fisheries.

Contact:

Dr. Steven Brandt
University of Maryland
Chesapeake Biological Lab.
P.O. Box 38
Solomons, MD 20688
(301) 326-4281

Ref. no. 14

BRANDT, S.B.

New York - State University College, Oswego
University Research Center

FOOD HABITS OF ADULT TROUT AND SALMON IN LAKE ONTARIO

Starting date: 06/01/1983

Completion date: 12/31/1986

* means that date is uncertain

Project no.: R/F-34

Sponsor: New York Sea Grant Institute

Area: Lake Ontario

Keywords:

biology, fish, lake trout, salmon, diet, seasonal,
predation, monitoring, populations, brown trout,
rainbow trout, coho salmon, chinook salmon, alewife,
rainbow smelt, competition, abundance, sport fishing

Description:

OBJECTIVES:

To (1) examine the composition, seasonal variation,
and predator-prey size ratio of the diet of adult
trout and salmon in Lake Ontario; and (2) assess the
usefulness of diet monitoring as an early warning
tool of predator-prey imbalances in fish populations.

RATIONALE:

This study, part of a lakes-wide investigation of
salmonid food habits, will provide information on
predator-prey interactions in Lake Ontario. This
information will be useful to managers in evaluating
the ecologic effects of alternative stocking policies
and procedures.

ACCOMPLISHMENTS:

In 1984, predominant salmonid prey was alewife,
followed by rainbow smelt and slimy sculpin. Most
alewives and smelt eaten were adults. Of the total 906
salmonid stomachs examined in 1984, approximately
40% were empty (also similar to 1983). Diets in
summer/fall 1984 dominated by alewife and smelt.
Spring diets were more varied, also including insects,
crawfish, and other fishes.

1984 diet data do not give evidence of excessive predation
by Lake Ontario salmonids on available forage stocks.

Contact:

Dr. Steven Brandt
University of Maryland
Chesapeake Biological Lab.
P.O. Box 38
Solomons MD 20688

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 15

BRAZO, D.C.

Indiana - Department of Natural Resources, Columbia City
Division of Fish and Wildlife

STATUS OF LAKE TROUT IN SOUTHERN LAKE MICHIGAN

Starting date: 05/1985

Completion date: 04/1986

* means that date is uncertain

Project no.:

Sponsor: Indiana Department of Natural Resources

Area: Lake Michigan, Indiana waters

Keywords:

biology, fish, lake trout, rehabilitation,
growth, sea lamprey wounding, reefs, management,
diet, rainbow smelt, alewife, bloater chub, yellow perch

Description:

OBJECTIVES:

To (1) determine the condition (status) of the lake trout population in Indiana waters of Lake Michigan; (2) provide the U.S. Fish and Wildlife Service with current information about lake trout rehabilitation and sea lamprey wounding rates on lake trout in southern Lake Michigan; (3) provide Indiana State Board of Health with lake trout samples for contaminant analysis; and (4) evaluate the potential of an offshore reef for lake trout stocking.

RESULTS:

Some 572 lake trout were collected in 20 gill net samples in August. Catch per effort ranged from 0 to 72 fish and was highest in 45-60 feet of water. Of these, 473 fish were aged using fin clips and length data. Age V, VI, and VII fish comprised 66.7% of the catch. Growth rates were 0.74 inches larger for all ages of lake trout from VI-X. Sex ratios were 1.2:1 in favor of males but after age VII, sex ratios were nearly equal. Diets of 491 lake trout were examined. Rainbow smelt and alewives were numerically most important with yellow perch and bloaters as secondary components. Lamprey wound rates were low (0.4%) in lake trout from the Indiana waters of Lake Michigan. Suitable substrate and several juvenile and adult lake trout were observed in scuba operations and gill net lifts at an offshore site.

CONCLUSIONS:

Lake trout populations in southern Lake Michigan continue to flourish though no native fish

preferred temperature seemed to be 46.4 - 50.0. Indeed no lake trout were captured in water temperatures greater than 51.8. Mortality rates of fish age IV, VII, and VIII appear to be declining, possibly as a result of daily catch limit restrictions. Growth rates also declined in 1985. Male lake trout mature earlier than females and netted males were 80-90% mature at ages IV and V while females showed less than 50% maturity at those ages. The diet of lake trout remains more varied than other salmonids and rainbow smelt are most important especially to smaller lake trout (<23.7 inches). Alewives are more important to larger fish than small fish. Results from sampling on an offshore reef were encouraging and 115,000 fall fingerling lake trout were stocked by the USFWS in November, 1985.

Contact:

Dr. Daniel Brazo
Indiana Division of Natural Resources
Lake Michigan Fisheries Station
Naval Armory Building
Michigan City, IN 46360

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 16

BRAZO, D.C.

Indiana - Department of Natural Resources, Columbia City
Division of Fisheries and Wildlife

LAKE TROUT POPULATIONS ASSESSMENT AND SPAWNING REEF EVALUATION

Starting date: 05/1987

Completion date: 04/1988

* means that date is uncertain

Project no.:

Sponsor: Indiana Department of Natural Resources

Area: Lake Michigan; Kintzele Black Ditch

Keywords:

biology, fish, management, lake trout, rehabilitation,
spawning, reefs, sea lamprey wounding, biomass, diet

Description:

OBJECTIVES:

To (1) determine the condition (status) of the lake trout population in Indiana waters of Lake Michigan; (2) provide the U.S. Fish and Wildlife Service with current information about lake trout rehabilitation and sea lamprey wounding rates on lake trout in southern Lake Michigan; and (3) collect baseline data on adult and juvenile lake trout at a potential offshore spawning reef and nursery area for lake trout.

METHODOLOGY:

Sampling will be conducted along a transect with the base located at Kintzele (Black) Ditch. A minimum of 500 fish will be collected. Data collected from each fish will include length, weight, sex, state of maturity, fin clips, stomach contents, sea lamprey wounding, and contaminant levels. In addition nets will be set to determine the potential of an offshore area as a lake trout spawning reef.

Contact:

Dr. Daniel Brazo
Indiana Division of Natural Resources
Lake Michigan Fisheries Station
Naval Armory Building
Michigan City, IN 46360

Ref. no. 17

BRONTE, C.R.

Wisconsin - Red Cliff Band of Lake Superior Chippewas, Bayfield
Red Cliff Fisheries Department

LAKE TROUT DIET SURVEY

Starting date: 1984

Completion date: 1987

* means that date is uncertain

Project no.:

Sponsor: Red Cliff Band through BIA P.L. 93-638 Contract

Area: Lake Superior; Apostle Islands

Keywords:

biology, fish, lake trout, diet, predation, forage base

Description:

OBJECTIVES:

To determine diet composition and utilization of
prey species.

Contact:

Charles R. Bronte
Red Cliff Band of Lake Superior Chippewas
Red Cliff Fisheries Department
Box 529
Bayfield, WI 54814
(715) 779-5162

Ref. no. 18

BRONTE, C.R.

Wisconsin - Red Cliff Band of Lake Superior Chippewas, Bayfield
Red Cliff Fisheries Department

PRE-RECRUIT LAKE TROUT ASSESSMENT

Starting date: 1982

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Red Cliff Band through BIA P.L. 93-638 Contract

Area: Lake Superior; northwestern Apostle Islands;
Devil's Island Shoal

Keywords:

biology, fish, lake trout, origin, abundance, reefs

Description:

OBJECTIVES:

To determine, age, origin (hatchery or wild) and
relative abundance of pre-recruit lake trout in
and in areas adjacent to Devil's Island Shoal
Refuge.

Contact:

Charles R. Bronte
Red Cliff Band of Lake Superior Chippewas
Red Cliff Fisheries Department
Box 529
Bayfield, WI 54814
(715) 779-5162

Ref. no. 19

BRONTE, C.R.

Wisconsin - Red Cliff Band of Lake Superior Chippewas, Bayfield
Red Cliff Fisheries Department

LAKE TROUT SPAWNING ASSESSMENT

Starting date: 1981

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Red Cliff Band through BIA P.L. 93-638 Contract

Area: Lake Superior; western and central Apostle Islands

Keywords:

biology, fish, lake trout, reproduction, origin, spawning
abundance,

Description:

Work continues on a project initiated in 1981 to determine the relative abundance, age, and origin of lake trout utilizing traditional spawning areas in the western region of the Apostle Islands of Lake Superior. Sampling sites were selected to complement similar assessments on other spawning locations in the islands by the U.S. Fish and Wildlife Service and Wisconsin Department of Natural Resources.

Since 1960, nearly 2,000,000 lake trout have been stocked in the sampling area between Herbster and Sand Bay in an attempt to re-establish spawning populations on nearshore and offshore locations in the area. Survivors of the 1975 and earlier year classes should be fully mature by now and contributing to natural reproduction and the eventual recolonization of spawning sites.

Contact:

Charles R. Bronte
Red Cliff Band of Lake Superior Chippewas
Red Cliff Fisheries Department
Box 529
Bayfield, WI 54814
(715) 779-5162

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 20

BRONTE, C.R.

Wisconsin - Red Cliff Band of Lake Superior Chippewas, Bayfield
Red Cliff Fisheries Department

SPRING LAKE TROUT ASSESSMENT

Starting date: 1986

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Red Cliff Band through BIA P.L. 93-638 Contract

Area: Lake Superior, western Michigan waters; Apostle Islands

Keywords:

biology, fish, lake trout, abundance, origin,
sea lamprey wounding, mortality, monitoring

Description:

OBJECTIVES:

To determine relative abundance, origin, sea lamprey
wounding and total mortality of adult lake trout.

Contact:

Charles R. Bronte
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Red Cliff Fisheries Department
Box 529
Bayfield, WI 54814
(715) 779-5162

Ref. no. 21

BRONTE, C.R.

Wisconsin - Red Cliff Band of Lake Superior Chippewas, Bayfield
Red Cliff Fisheries Department

COMMERCIAL FISHERY MONITORING

Starting date: 1980

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Red Cliff Band through BIA P.L. 93-638 Contract

Area: Lake Superior; Apostle Islands; Chocolay River, Michigan

Keywords:

biology, fish, lake trout, monitoring, commercial fishing,
yield, management

Description:

OBJECTIVES:

To determine (1) age and size composition of
commercially caught lake trout; and (2) total
harvest through compiling catch and effort
statistics from mandatory catch reports filed
by fishermen.

Contact:

Charles R. Bronte
Red Cliff Band of Lake Superior Chippewas
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Box 529
Bayfield, WI 54814
(715) 779-5162

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 22

BUSCH, W.D.N.; SLY, P.G.

New York - U.S. Fish and Wildlife Service, Cortland;
Ontario - Canadian Centre for Inland Waters, Burlington

CLASSIFICATION AND INVENTORY OF GREAT LAKES AQUATIC HABITATS

Starting date: 01/1987

Completion date: 02/1988

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fish. Comm., Inter. Jt. Comm., other
support

Area: Lake Michigan; Lake Erie; Lake Ontario; Lake Superior;
Lake Huron

Keywords:

biology, fish, lake trout, habitat, walleye, model

Description:

OBJECTIVES:

To (1) identify habitat requirements of biological resources (key species - lake trout, walleye); (2) identify physical, chemical, biological parameters which can be used as surrogates to identification of habitat types; and (3) develop a biologically correct habitat classification system.

Contact:

W. Dieter N. Busch
U.S. Fish and Wildlife Service
Tunison Laboratory
28 Gracie Road
Cortland, NY 13045
(607) 753-1460

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 23

CARLINE, R.F.

Pennsylvania - Pennsylvania Cooperative Fish and Wildlife
Research Unit, University Park

EFFECT OF SIZE AT STOCKING ON SURVIVAL OF LAKE TROUT IN
LAKE ONTARIO

Starting date: 05/1987

Completion date: 12/1989

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service, preliminary work

Area: Lake Ontario near Oswego, New York

Keywords:

biology, fish, lake trout, monitoring, management

Description:

OBJECTIVES:

To determine if survival is related to length
at stocking by using scale characteristics to
backcalculate length at stocking of individual
lake trout captured 1-2 years after stocking.

Contact:

Dr. Robert Carline
Pennsylvania Coop. Fish and Wildlife Research Unit
Ferguson Building
University of Pennsylvania
University Park, PA 16802
(814) 865-4511

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 24

CHRISTENSEN, B.; SUTHERLAND, D.
Wisconsin - University of Wisconsin, Madison
Veterinary Science

FISH PARASITE COMMUNITIES AS INDICATORS OF PREDATOR-
PREY RELATIONSHIPS IN LAKE MICHIGAN

Starting date: 9/01/1984
Completion date: 8/31/1987
* means that date is uncertain
Project no.: R/LR-27
Sponsor: Wisconsin Sea Grant

Area: Lake Michigan; Lake Superior

Keywords:

biology, salmon, lake trout, alewife, rainbow smelt,
populations, predation, diet, parasites, fish,
forage base, growth, reproduction, coho salmon,
chinook salmon

Description:

OBJECTIVES:

To (1) analyze parasite community structure of Lake Michigan predators (i.e., coho and chinook salmon, and lake trout) and their forage fish especially alewife and rainbow smelt, to identify parasites that can serve as biological tags to indicate shifts in salmonid diet; and (2) examine recruitment of parasite communities by Lake Michigan's exotic fish species to see if the artificial nature of the system can result in unusual magnification of parasites that might reduce salmonid growth and/or reproduction.

METHODOLOGY:

Obtain intestinal tracts, gills, and swimming bladders of salmonids in conjunction with the salmonid diet survey of Kitchell and prey species from DNR Chub Assessment Studies; analyze host-parasite data at UW-Madison computing service facilities.

RATIONALE:

To provide a variable auxiliary to food stomach analysis for monitoring Lake Michigan salmonid food consumption and increased diversity of diet as seen by Stewart et al. (1981). While stomach analyses indicate prey eaten just prior to fish capture, parasites recruited during ingestion of intermediate hosts remain in intestinal tract for much longer time periods.

ACCOMPLISHMENTS:

Necropsy of more than 1,175 fish representing 28 species from four collecting sites (Racine, Sheboygan, Sturgeon Bay, Bayfield) has resulted in recovery of 46 parasite taxa. Abundance of an Acanthocephalan has been identified as a

is being examined. Parasite data has been shared with USFWS and DNR fishery biologists.

Contact:

Dr. Bruce M. Christensen
Department of Veterinary Science
1655 Linden Drive
University of Wisconsin
Madison, WI 53706
(608) 262-3850

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 25

COLLINS, H.L.

Minnesota - University of Minnesota, Duluth
College of Science & Engineering
Biology Department

FOOD HABITS AND FORAGE BASE OF LAKE SUPERIOR SALMONIDS

Starting date: 10/01/83

Completion date: 09/30/86

* means that date is uncertain

Project no.: R/F-14

Sponsor: Minnesota Sea Grant College Program

Area: Lake Superior, Duluth to Grand Portage

Keywords:

fish, commercial fishing, forage base,
sport fishing, predation, salmonid, biology,
lake trout, diet

Description:

OBJECTIVES:

To (1) collect digestive tracts of western Lake Superior salmonids from commercial and sport fishermen, a) collections will be acquired on a seasonal basis as well as geographical (Duluth to Grand Portage), b) food habits will be determined on all salmonids available and reported in terms of species, sex, size and age; and (2) correlate salmonid food habits to forage sampling records available at the Ashland Biological Station, Great Lakes Fishery Laboratory.

RATIONALE:

Since trout and salmon are economically important, and their usual prey has decreased, there is concern about the availability of alternative foods and future stocking of these predators. We need to determine what the trout and salmon in Lake Superior are eating at different locations and over time.

ACCOMPLISHMENTS:

Approximately 2,500 salmonid stomachs were collected from sport fishermen and commercial catches. Of these samples, 987 have been analyzed for contents. The diets of Lake Superior salmonids in summer are substantially different from those of the lower Great Lakes. Invertebrates are predominant in Lake Superior salmonid stomachs in contrast to forage fish in those of the lower Great Lakes.

Contact:

Dr. Hollie L. Collins
Department of Biology
323 Life Science
University of Minnesota

Ref. no. 26

COLLINS, J.J.; ANDERSON, D.M.

Ontario - Ministry of Natural Resources, Tehkummah
Lake Huron Fisheries Research Unit

LAKE TROUT AND LAKE TROUT-SPLAKE BACKCROSS EGG SURVIVAL EXPERIMENT

Starting date: 10/1986
Completion date: 06/1991 or later
* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Huron; South Bay; Manitoulin Island

Keywords:

biology, fish, lake trout, splake, genetics,
eggs, survival, reproduction, reefs, monitoring,
stocking, management, predation, larval fish, fish strains

Description:

OBJECTIVES:

To (1) visually survey spawning shoals for evidence of natural reproduction; (2) monitor swim-up fry production with emergent fry traps; (3) plant eyed-eggs in egg baskets and honeycomb trays in spawning substrate; and (4) evaluate the annual variance in survival to swim-up fry stages of the two genotypes in experimental baskets both protected and unprotected from predators.

Contact:

John J. Collins
Lake Huron Fisheries Assessment Unit
Ontario Ministry of Natural Resources
RR 1
Tehkummah, ON POP 2C0
(705) 859-3137

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 27

COLLINS, J.J.; ANDERSON, D.M.

Ontario - Ministry of Natural Resources, Tehkummah
Lake Huron Fisheries Research Unit

LAKE TROUT AND LAKE TROUT-SPLAKE BACKCROSS COMPARISON STUDY

Starting date: 05/1977

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Huron; South Bay; Manitoulin Island

Keywords:

biology, fish, lake trout, splake, genetics,
stocking, management, monitoring, fitness, predation,
survival, growth, reproduction, fish strains

Description:

OBJECTIVES:

To (1) determine the relative fitness of two
genotypes as self-sustaining top predators;
and (2) evaluate each genotype for
survival, growth, maturation rates, and
recruitment from natural reproduction.

Contact:

John J. Collins
Lake Huron Fisheries Assessment Unit
Ontario Ministry of Natural Resources
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(705) 859-3137

Ref. no. 28

COLLINSON, C.; HOLM, N.P.; NORBY, R.
Illinois - Illinois State Geological Survey, Champaign
Stratigraphy and Surficial Geology Section

THE ROLE OF SILURIAN BEDROCK REEFS IN THE
LAKE MICHIGAN LAKE TROUT FISHERY

Starting date: 6/01/1986
Completion date: 6/30/1987
* means that date is uncertain

Project no.:

Sponsor: Illinois Department of Conservation

Area: Lake Michigan, Illinois waters; Julian's Reef;
Wilmette Reef

Keywords:

geology, substrate, lake trout, fish, spawning,
hydrography, currents, habitat, reefs, mapping,
rehabilitation

Description:

OBJECTIVES:

To (1) determine the substrate types and their distribution on Julian's Reef and Wilmette Reef in southern Lake Michigan using geophysical soundings, sediment sampling, and underwater photography; (2) define, locate, and determine which areas of the reefs would be most suitable for planting lake trout and for examining for the presence of lake trout eggs and fry and; (3) prepare maps of substrate type and hydrography extending for one to two miles in each direction from the reefs.

Contact:

Dr. Charles Collinson
Illinois State Geological Survey
615 E. Peabody Dr.
Champaign, Illinois 61820
(217) 224-6944

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 29

COPEES, F.; COBLE, D.

Wisconsin - University of Wisconsin, Stevens Point
Biology Department;

Wisconsin - University of Wisconsin-Stevens Point
Wis. Coop. Fish. Res. Unit

TROPHIC ECOLOGY AND POPULATION STATISTICS OF BURBOT,
LOTA LOTA, IN GREEN BAY AND LAKE MICHIGAN

Starting date: 9/01/1986

Completion date: 8/31/1989

* means that date is uncertain

Project no.:

Sponsor: University of Wisconsin Sea Grant Institute

Area: Lake Michigan, western; Green Bay

Keywords:

biology, fish, burbot, lake trout, walleye,
tagging, age, growth, diet, seasonal, populations

Description:

The burbot populations in Green Bay and in Lake Michigan are burgeoning and have the potential of becoming an important commercial fishery. This project is assembling the basic biological information about the burbot needed to assess its role in the lake ecosystem and whether a large burbot population might adversely affect other fish populations. This information will aid in the development of a model of the Green Bay fish community and its food web, which will enable fishery agencies to develop a burbot management plan for the lake and improve management of the bay's other fisheries as well.

Burbot, lake trout, walleye, and other fish species will be collected at various sites during each of the four seasons for comparison of their diet. Age and growth will be measured on the fish species.

Contact:

Dr. Frederick A. Copes
Biology Department
University of Wisconsin
Stevens Point, WI 54481
(715) 346-3078

Ref. no. 30

CORNELIUS, F.C.

New York - Department of Environmental Conservation, Dunkirk
Lake Erie Fisheries Unit

A STRATEGIC PLAN FOR THE REHABILITATION OF LAKE TROUT
IN EASTERN LAKE ERIE

Starting date: 04/1985

Completion date: 11/2020

* means that date is uncertain

Project no.:

Sponsor: New York State Department of Environmental
Conservation

Area: Lake Erie, New York waters

Keywords:

biology, fish, lake trout, rehabilitation,
mortality, management, reproduction, monitoring

Description:

OBJECTIVES:

To (1) limit total annual mortality of lake trout to 40 % or less by 1991; (2) build an adult stock of about 7.5 years of age and produce 10,000 yearling lake trout annually by 2000; and (3) attain an annual harvestable surplus of 50,000 kg (110,000 lb.) of lake trout and an annual production of 200,000 yearling lake trout through natural reproduction by 2020.

Contact:

Floyd C. Cornelius
New York State Department of Environmental Conservation
Dunkirk Fisheries Station
Box 506
178 Point Drive North
Dunkirk, NY 14048
(716) 366-0228

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 31

DEVAULT, D.

Illinois - U.S. Environmental Protection Agency, Chicago
Great Lakes National Program Office

TREND MONITORING OF CONTAMINANTS IN GREAT LAKES FISH

Starting date: 10/1982
Completion date: 09/1986
* means that date is uncertain
Project no.: EPA04-0259
Sponsor: U.S. EPA

Area: Lake Michigan; Lake Erie; Lake Huron; Lake Superior;
Lake Ontario; Lake St. Clair

Keywords:

biology, fish, lake trout, walleye, contaminants, monitoring,
chemistry, smelt

Description:

Whole lake trout (walleye in Lake Erie) and smelt from the Great Lakes and Lake St. Clair are analyzed for problem contaminants to determine trends. Sample collection and report preparation are done jointly by the U.S. EPA and the U.S. Fish and Wildlife Service. Sample analysis is done by the U.S. EPA.

Contact:

Dr. David DeVault
U.S. Environmental Protection Agency
Great Lakes National Program Office
536 S. Clark St., Rm. 958
Chicago, IL 60605
(312) 353-1375

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 32

DIANA, J.

Michigan - University of Michigan, Ann Arbor
School of Natural Resources;
Michigan - Michigan State University, East Lansing
Department of Fisheries and Wildlife

FOOD HABITS OF SALMONIDS IN LAKE HURON

Starting date: 4/01/1983
Completion date: 12/31/1984
* means that date is uncertain
Project no.: R/GLF-18
Sponsor: Michigan Sea Grant College Program

Area: Lake Huron

Keywords:

diet, fish, biology, salmonid, alewife, predation,
smelt, chinook salmon, habitat, lake trout, coho salmon,
steelhead, brown trout, forage base, distribution, trout,
commercial fishing

Description:

Objectives:

To (1) monitor diet of salmonids at several sites in Lake Huron, utilizing samples collected by charter boat captains; (2) compare these data to net collections of salmon taken one or two times in midsummer; (3) analyze depth distribution by coupled netting and acoustic surveys to evaluate habitat use; (4) further analyze between chinook salmon, smelt, and alewives to predict diet selection; and (5) compare diet predictions based on prey selection and depth distribution to observed diet.

Methodology:

To utilize data on salmon diet collected by charter boat captains; to evaluate mechanisms of predation. Depth distribution and temperature occupation will be determined by telemetry. Sampling bias will be analyzed by netting. These will be compared to diet measurements from charter boat data to evaluate which influences actual composition.

Contact:

Dr. James S. Diana
School of Natural Resources
University of Michigan
Ann Arbor, MI 48109
(313) 763-5834

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 33

DONALD, D.B.

Saskatchewan - Environment Canada, Regina
Inland Waters Directorate

COMPARATIVE BIOLOGY OF SYMPATRIC AND ALLOPATRIC
POPULATIONS OF LAKE TROUT AND BULL TROUT

Starting date: 1984

Completion date: 1989

* means that date is uncertain

Project no.:

Sponsor: Environment Canada, Parks

Area: Several lakes in the Rocky Mountains

Keywords:

biology, fish, lake trout, bull trout, populations,
physiology, genetics, distribution

Description:

Contact:

Donald B. Donald
Inland Waters Directorate
Motherwell Building
1st Floor
1901 Victoria Ave.
Regina, Sask. S4P 3R4

Ref. no. 34

EBENER, M.P.

Wisconsin - Great Lakes Indian Fish and Wildlife Commission, Odanah

HARVEST MONITORING OF TRIBAL COMMERCIAL CATCHES

Starting date: 05/1983

Completion date: continuing

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Indian Fish and Wildlife Commission

Area: Lake Superior, Minnesota waters, Wisconsin waters

Keywords:

biology, fish, lake trout, monitoring, whitefish,
management, commercial fishing

Description:

OBJECTIVES:

To (1) monitor tribal commercial harvests of lake trout and whitefish; (2) sample 200 of each species each month, and (3) write report detailing biological statistics of the two species.

Contact:

Mark Ebener

Great Lakes Indian Fish and Wildlife Commission

P.O. Box 9

Odanah, WI 54861

(715) 682-6619

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 35

ECK, G.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

MORTALITY OF PRERECRUIT LAKE TROUT - LAKE MICHIGAN

Starting date: 5/01/1983

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan, off Holland, Michigan; Michigan waters

Keywords:

biology, fish, lake trout, mortality, yearling,
 stocking, rehabilitation, monitoring, abundance,
 commercial fishing, predation, survival,
 salmonid, life history

Description:

Lack of accurate estimates of lake trout mortality from time of stocking to age V is a major impediment to projection of absolute sizes of the standing stocks of lake trout planted in the Great Lakes as a basis for evaluating efforts to restore self-sustaining populations. Immature lake trout are only nominally vulnerable to largemesh gillnet conventionally used to capture adults in both experimental and (past) commercial fishing. The overall goal of this work unit is to develop and implement methods on a pilot-test basis for reliably estimating prerecruit mortality. The ongoing field experiment involves systematic sampling each year with wing-trawls for lake trout stocked as a special plant of yearlings in Lake Michigan near Holland, Michigan, in spring 1983; hopefully the resulting data will permit the segregation of temporal effects of dispersal after release from absolute declines in abundances attributable to mortality.

Contact:

Gary W. Eck
 U.S. Fish and Wildlife Service
 National Fisheries Center--Great Lakes
 1451 Green Road
 Ann Arbor, MI 48105
 (313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 36

EDGINGTON, D.; KLUMP, J.V.; BINKOWSKI, F.P.;
KASTER, J.L.

Wisconsin - University of Wisconsin-Milwaukee
Center for Great Lakes Studies

ENVIRONMENTAL EFFECTS AND FEASIBILITY OF FLY ASH
BLOCK ARTIFICIAL REEF CONSTRUCTION

Starting date: 12/01/1984

Completion date: 12/31/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Electric Power Co.

Area: Laboratory

Keywords:

biology, chemistry, artificial reefs, fly ash,
inorganics, metals, bioassay, toxics, water quality,
fish, zooplankton, phytoplankton, fathead minnow,
walleye, lake trout

Description:

These studies are being done to test environmental effects of fly ash blocks on fish, phytoplankton, and zooplankton to determine whether fly ash blocks can be used in artificial reefs in Lake Michigan. This would be an alternative to current disposal practices of coal combustion waste.

Contact:

Dr. D. Edgington
Center for Great Lakes Studies
600 E. Greenfield Ave.
University of Wisconsin
Milwaukee, WI 53204
(414) 224-3021

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 37

EDSALL, T.; BROWN, C.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

EVALUATION OF LAKE TROUT SPAWNING AND NURSERY
HABITAT IN GREAT LAKES WATERS

Starting date: 10/1982

Completion date: 9/1988

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service,
Great Lakes Fishery Commission

Area: Lake Michigan, Wilmette Reef; Lake Ontario; Lake
Michigan, Beaver Island area (Richard's Reef);
Lake Superior, Partridge Island Reef; Lake Huron,
Port Austin Reef; Lake Erie

Keywords:

biology, lake trout, fish, salmonid, rehabilitation,
spawning, mapping, substrate, hydrography, habitat, geology,
reefs, side scan sonar, reproduction

Description:

The Great Lakes Fishery Commission has determined that a more systematic approach needs to be taken to understand why lake trout are not successfully reproducing in four of the Great Lakes. The GLFC is sponsoring this project to examine and compare potential spawning reefs in each of the five Great Lakes. Work is currently being done using side scan sonar and a remotely operated underwater television camera to record and classify substrate types at historically productive spawning sites in Lake Huron and Lake Michigan. The results of these studies will permit the selection of stocking sites at which planted lake trout will be able to reproduce successfully.

Contact:

Dr. Tom Edsall
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1451 Green Road
Ann Arbor, MI 48105
(313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 38

EDSALL, T.; ESHENRODER, R.; JUDE, D.; KELSO, J.;
PECK, J.W.

Michigan - U.S. Fish and Wildlife Service, Ann Arbor;
Michigan - Great Lakes Fishery Commission, Ann Arbor;
Michigan - Michigan Sea Grant, Ann Arbor;
Canada - Dept. of Fisheries and Oceans;
Michigan - Michigan Dept. of Nat. Res., Marquette

FEASIBILITY STUDIES ON MEASURING IMPACTS OF ENVIRONMENTAL
DEGRADATION ON LAKE TROUT REPRODUCTION IN THE GREAT LAKES

Starting date: 1986

Completion date: 1987

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fishery Commission

Area: Lake Huron; Port Austin Reef; Hammond Bay

Keywords:

biology, fish, lake trout, reproduction, water quality,
survival, eggs, larval fish, reefs

Description:

OBJECTIVES:

To determine whether significant differences in survival of lake trout early life stages occur between a control site with high water quality and where stocked lake trout are successfully reproducing and other sites where degradation effects are expected and reproduction is wanting.

APPROACH:

There will be two experiments involving incubators. In the first, incubators will be deployed in the fall and retrieved in the spring on a spawning shoal, and in the second, incubators would be tested against seeded eggs in a raceway using Great Lakes water. A number of limnological observations will be made to aid in determining causative factors, if survival effects are found.

Contact:

Dr. Tom Edsall
U.S. Fish and Wildlife Service
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Ann Arbor, MI 48105
(313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 39

ELROD, J.H.

New York - U.S. Fish and Wildlife Service, Oswego
Oswego Biological Station

SURVEILLANCE AND STATUS OF FISH POPULATIONS IN LAKE ONTARIO

Starting date: 06/1978

Completion date: Continuing

* means that date is uncertain

Project no.: 980.5001

Sponsor: National Fisheries Center--Great Lakes

Area: Lake Ontario

Keywords:

biology, fish, lake trout, monitoring, abundance, distribution, mortality, diet, yellow perch, forage base, growth, management, sea lamprey wounding, rehabilitation, sport fishing, predation

Description:

OBJECTIVES:

To (1) determine the abundance, distribution, size/age composition, growth, mortality, maturity, diet, etc. for lake trout, yellow perch, and prey-fish resources; (2) determine the degree of success of sea lamprey control and lake trout rehabilitation programs; (3) evaluate the impact of fisheries and effectiveness of present regulations; (4) develop new interagency management plans; and (5) determine the capacity of prey-fish stocks to sustain present or increased levels of salmonid predation.

Contact:

Dr. Joseph Elrod
U.S. Fish and Wildlife Service
Oswego Biological Station
17 Lake Street
Oswego, NY 13126
(315) 343-3951

Ref. no. 40

ELROD, J.H.

New York - U.S. Fish and Wildlife Service, Oswego
Oswego Biological Center

APPRAISAL OF LAKE TROUT RESTORATION AND
SEA LAMPREY CONTROL IN LAKE ONTARIO

Starting date: 1978
Completion date: continuing
* means that date is uncertain
Project no.:
Sponsor: U.S. Fish and Wildlife Service

Area: Lake Ontario

Keywords:

biology, fish, lake trout, sea lamprey wounding, growth,
survival, distribution, management, mortality, sport fishing,
abundance, fish strains, spawning, homing, dispersal,
aquaculture, forage base

Description:

OBJECTIVES:

To (1) determine rates of survival and growth of hatchery-reared cohorts; (2) determine seasonal bathythermal and geographical distribution and abundance of lake trout by size, age, and genetic stock; (3) determine dispersal of hatchery-reared fish from stocking sites and the extent to which spawning fish home to the site at which they were stocked; (4) partition mortality into components due to fishing and to sea lamprey attacks; (5) determine effect of rearing techniques, stocking method, and time of stocking on post-stocking survival of hatchery-reared fish; and (6) determine relationships between lake trout and prey fishes.

Contact:

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17 Lake Street
Oswego, NY 13126
(315) 343-3951

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 41

EVANS, D.O.; SLY, P.G.

Ontario - Ministry of Natural Resources, Maple
Ontario - Canadian Centre for Inland Waters, Burlington

LAKE SIMCOE LAKE TROUT REHABILITATION

Starting date: 07/1987

Completion date: 1990

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Simcoe

Keywords:

biology, fish, lake trout, reefs, recruitment, rehabilitation

Description:

OBJECTIVES:

To determine the cause of recruitment failure.

Contact:

Dr. David O. Evans
Ontario Ministry of Natural Resources
P.O. Box 50
Maple, ON LOJ 1E0
(416) 832-2761

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 42

EVANS, M.; RICE, C.

Michigan - University of Michigan, Ann Arbor
Great Lakes Research Division

TOXAPHENE COMPARTITION AND RECYCLING IN LAKE MICHIGAN

Starting date: 1/01/1983

Completion date: 6/30/1986

* means that date is uncertain

Project no.: R/TS-26

Sponsor: Michigan Sea Grant

Area: Lake Michigan

Keywords:

chemistry, organics, bioaccumulation, water quality, metabolism, transport, invertebrates, fish, cycling, sediment traps, zooplankton, phytoplankton, toxics, biology, bloater chub, lake trout, sculpin, fate, toxaphene, food chain, Mysis, Amphipoda, Pontoporeia

Description:

OBJECTIVES:

In 1983-84: to (1) investigate toxaphene bioaccumulation and trophic transfer through a plankton-mysid-amphipod-sculpin food web; (2) characterize physical mechanisms for toxaphene transport; (3) investigate temporal variability in short-lived organisms; (4) compare toxaphene ecotoxicology with other contaminants; and (5) obtain quantitative information on toxaphene chromatographic patterns.

In 1985: to (1) continue #5 objectives; (2) investigate toxaphene biomagnification in bloaters and lake trout; and (3) test some of the existing mathematical models for the fate and transport of hydrophobic pollutants in pelagic food webs.

METHODOLOGY:

This study is based on obtaining qualitative and quantitative information on toxaphene levels in plankton, mysids, amphipods, sculpins, and sediment trap samples collected in 1982.

A peak selection computer program was developed which allows the collection of this quantitative information. Principal component analysis will be used to investigate toxaphene mixtures in the various components of the ecosystem under investigation.

Contact:

Dr. Marlene S. Evans
Great Lakes Research Division
University of Michigan

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 43

FITZSIMONS, J.; CAIRNS, V.

Ontario - Canada Centre for Inland Waters, Burlington
Great Lakes Laboratory for Fisheries and Aquatic Sciences

LAKE TROUT REPRODUCTION

Starting date: 1979

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of Fisheries and Oceans

Area: Lake Ontario; Stony Island

Keywords:

biology, fish, lake trout, reproduction, physiology,
monitoring, trace metals, chemistry, organics, inorganics,
bioassay, PCBs, reefs

Description:

OBJECTIVES:

To (1) repeat sperm viability studies in the fall to confirm 1984-85 findings; and (2) define any relationships between testicular constrictions and testicular levels of metals and chlorinated hydrocarbons.

RELEVANCE:

Elevated levels of chlorinated hydrocarbons in Lake Ontario lake trout and their eggs are of concern. Despite control measures, concentrations in the eggs are still at levels which have resulted in excessive egg and fry mortality in a number of field and lab studies. With the continued absence of natural reproduction in Lake Ontario there is a need to evaluate the potential impact of existing residues on egg and fry physiology and ultimate survival.

Contact:

John Fitzsimons
Great Lakes Laboratory for Fisheries and Aquatic Sciences
Bayfield Institute, Canada Centre for Inland Waters
867 Lakeshore Road, P.O. Box 5050
Burlington, ON L7R 4A6
(416) 637-4203

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 44

FOSTER, N.; BERLIN, W.; WOOTKE, C.
Michigan - National Fisheries Center--Great Lakes, Ann Arbor

ISOLATION AND IDENTIFICATION OF ATTRACTANT
PHEROMONES IN LAKE TROUT

Starting date: 1983
Completion date: Continuing
* means that date is uncertain
Project no.:
Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory; Lake Michigan; Clay Banks Reef

Keywords:

biology, biochemistry, pheromones, lake trout, homing,
fish, spawning, scent, reproduction, behavior, imprinting,
reefs, fish eggs, larval fish, rehabilitation

Description:

Unlike native lake trout, planted fish seem unable to find spawning areas where adequate survival of early life stages will occur. Laboratory experiments conducted in 1979-81 with adults in large pools found that egg deposition and certain breeding behaviors occurred significantly more often at test reefs with natural cues (fry feces) present than at control reefs. Meanwhile, in winter, 1978-79, young were exposed to an artificial imprintant, phenethyl alcohol (PEA), as eyed eggs through hatching to the late fry stage. In spring, 1980, a second group of the same 1979 year class was exposed to the same PEA concentration, and a control group left unexposed. Each of the three groups was uniquely finclipped and planted in spring, 1980, near Clay Banks in western Lake Michigan. In both falls, 1985-86, about twice as many adults from the group exposed to PEA as fry were recaptured in areas affected by the odor plume from a PEA decoy site as were adults from the other two groups.

Contact:

Dr. Neal R. Foster
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Ann Arbor, MI 48105
(313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 45

FRY, F.E.J.; WHEATON, T.
Ontario - University of Toronto, Toronto
Department of Zoology

EFFECTS OF ALTERNATE CLOSURE ON ALGONQUIN PARK LAKES

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: University of Toronto

Area: Three lakes in Algonquin Park, Canada

Keywords:
biology, fish, lake trout, monitoring, growth,
creel census, size

Description:
Creel census records are analyzed for three lakes in Algonquin Park. These are each of an area of a square mile or so. Over the period two of them, after two years of initial records, put on a program of alternate closure for twenty years. For the next fifteen they were closed one year and then open two. Finally they were fished continuously. The third lake had a somewhat more restricted schedule of closure. There are good records of size and state of maturity but unfortunately only scale collections for age determination.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 46

GIESY, J.; ZABIK, M.

Michigan - Michigan State University, East Lansing
Pesticide Research CenterEFFECTS OF MATERNAL EXPOSURE OF RAINBOW TROUT
TO 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)
ON REPRODUCTION

Starting date: 7/01/1987

Completion date: 6/30/1990

* means that date is uncertain

Project no.: R/TS-31

Sponsor: Michigan Sea Grant Program

Area: Lake Michigan; Lake Huron; Lake Superior; Laboratory

Keywords:

chemistry, organics, TCDD, dioxin, PCDD, PCDF,
fish, eggs, furans, contaminants, rainbow trout,
salmonid, mortality, toxics, reproduction, bioassay,
chinook salmon, lake trout, steelhead, biology,
analytical methods, pattern recognition, larval fish

Description:

OBJECTIVES:

To (1) determine the dose-lethality relationship for eggs and fry from adult female rainbow trout exposed to ecologically relevant waterborne concentrations of 2,3,7,8-tetrachlorodibenzo -p- dioxin (2,3,7,8-TCDD); (2) determine the hazard presently existing and potential future concentrations of 2,3,7,8-TCDD in eggs of salmonid fishes from the Great Lakes; (3) determine the isomer group ratios for PCDD's (C14-C18), PCDF's (C14-C18), TCDD's and TCDF's in fish and fish eggs of chinook, lake trout, and steelhead in Lakes Huron, Michigan, and Superior; and (4) examine the use of isomer group ratios to identify sources and background concentrations and employ pattern recognition to the distribution, source, and background concentrations of dioxins and furans in Great Lakes fish eggs.

METHODOLOGY:

Eggs and tissues from salmonids from Lakes Huron, Michigan, and Superior will be collected by MDNR, USFWS, and the Commercial Fisheries. Reversed phase HPLC on Zorbax ODS with methanol eluent will separate chemically similar species from PCDF's and separates CDD's by degree of chlorination. Isomers in the HPLC fractions will be measured by GC/MS and interpreted using pattern recognition techniques. Adult, 200 g, rainbow trout will be exposed to waterborne concentrations of 5.0×10^{-3} , 5.0×10^{-2} and 0.1 mg 3H-labelled 2,3,7,8-TCDD per liter for one year. Concentrations of TCDD in

mortality will be determined.

RATIONALE:

Polychlorinated dibenzo dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) result from many human activities and are widespread in the environment. These compounds can be extremely toxic to fish. Dose-response relationships are needed to be able to assess the hazard of these compound to fish eggs and fry, where they tend to be concentrated. This study will mesh with the efforts of GLERL/NOAA into the dynamics of PAH. Furthermore, this study will address a call from IJC Nonpoint Task Force to initiate more studies into nonpoint source contaminants, such as dioxins and dibenzofurans.

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Ref. no. 47

GOLDTHWAITE, D.B.

Massachusetts - U.S. Fish and Wildlife Service, Newton Corner

PRODUCTION AND STOCKING OF CODED-WIRE TAGGED LAKE TROUT
IN LAKES ERIE AND ONTARIO

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Ontario; Lake Erie, eastern basin

Keywords:

biology, fish, lake trout, monitoring, rehabilitation

Description:

Part of a large study with other agencies--Lake Trout
Rehabilitation Committee.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 48

GORDEN, R.; HORNS, W.

Illinois - Illinois Natural History Survey, Champaign

SPORTFISHING CREEL CENSUS OF THE ILLINOIS PORTION
OF LAKE MICHIGAN

Starting date: 2/01/1985

Completion date: 4/30/1989

* means that date is uncertain

Project no.:

Sponsor: Illinois Dept. of Conservation

Area: Lake Michigan, Illinois waters

Keywords:

recreation, biology, creel census, sport fishing,
fish, management, salmonid, lake trout, coho salmon,
chinook salmon, rainbow trout, brown trout, trout, salmon

Description:

The creel survey covers all sport fishing in the Illinois waters of Lake Michigan, with the exception of charter-boat fishing. The following components of the sport fishery are covered: summer fishing (including pedestrian angling, fishing from launched boats kept at moorings), smelt fishing, snagging, and winter fishing (including ice fishing and fishing in power plant discharge areas). The general intent of the project is to provide reliable estimates of sport fishing activity, sport fish harvest, expenditures for sport fishing, and the quality of sport fishing.

The first year of the continuing creel survey ended 1 April 1986. It was estimated that 1.3 million yellow perch, 120,000 coho salmon, and over 50,000 chinook salmon were caught by Illinois anglers (excluding charter boat fishing).

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 49

GRIMA, A.P.L.; JAFFERAY, B.
 Ontario - University of Toronto, Toronto
 Institute of Environmental Studies

ALLOCATION OF FISHERY RESOURCES IN LAKE HURON AND
 GEORGIAN BAY, ONTARIO

Starting date: 04/01/1987
 Completion date: 03/31/1988
 * means that date is uncertain
 Project no.:
 Sponsor: Ontario Ministry of Natural Resources,
 Fisheries Branch

Area: Lake Huron; Georgian Bay

Keywords:
 biology, fish, lake trout, monitoring

Description:

In Canada the approach to the management of fish resources and their habitats has been in turmoil for several decades, especially during the past decade. That many direct and indirect users of the aquatic ecosystems have been and are continuing to make improper use of them is widely recognized by the public and in formal government policies. Some of the improprieties have been reduced while others are intensifying. How to reduce all improprieties and how to foster meliorative husbandry are being addressed with respect to ecological, social, economic, and political aspects of the man-nature ecosystem. Reconsideration of all rights to the use of fish and their habitats, where the "rights" may be de jure and formally sanctioned, or de facto and informally accepted or imagined and illegal, is leading to proposals that legitimate rights be clarified and be allocated in more explicit and open ways. As allocative devices both the market system and processes of community-level negotiation are being developed further, and the centralized administrative (or bureaucratic) device is being reformed to accommodate the greater use of complementary devices. This study explores these issues with respect to intrajurisdictional problems and opportunities in Canada.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 50

GUISE, K.S.

Minnesota - University of Minnesota, St. Paul
Department of Animal Science

GENE TRANSFER OF GROWTH HORMONE GENE FOR GROWTH
PROMOTION IN OVIPARIOUS TELEOSTEAN FISH

Starting date: 10/01/1985

Completion date: 09/30/1988

* means that date is uncertain

Project no.: R/A-3

Sponsor: Minnesota Sea Grant College Program

Area: Lake Superior; Laboratory

Keywords:

biology, genetics, goldfish, hormones, salmonid,
economics, recombinant DNA, fish, lake trout, growth

Description:

OBJECTIVES:

To (1) develop methods of gene transfer in fish so that genes of economic importance might be transferred or enhanced; (2) apply the developed methods to the transfer and incorporation into the germ line of extra copies of the genes encoding growth hormone; (3) determine the effect of enhanced growth hormone production on the growth and feeding characteristics of the recombinant fish, in comparison with the known effect of injected growth hormone; and (4) initiate the isolation and cloning of fish genes for future transfer and evaluation.

METHODOLOGY:

Gene transfer techniques (CaPO₄, precipitation, sperm head binding, or microinjection) will be developed and optimized using the herpes simplex thymidine kinase gene as a test system. An expressible mammalian growth hormone gene will be transferred and evaluated. Salmonids will be recipients of choice, with goldfish as a laboratory model system. Jack Wingate, Supervisor of Fish Research, Minnesota Department of Natural Resources, is especially interested in its application to their effort to rebuild the lake trout (*Salvelinus namaycush*) population in Lake Superior.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 51

GUNN, J.M.; NOAKES, D.L.G.

Ontario - Ministry of Natural Resources, Toronto
Fisheries Branch;

Ontario - University of Guelph, Guelph
Department of Zoology

BEHAVIOURAL RESPONSE OF LAKE TROUT TO EPISODIC ACIDIFICATION

Starting date: 1985

Completion date: 1987

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources,
National Research Council of Canada

Area: Lake Ontario

Keywords:

biology, fish, lake trout, spawning, chemistry,
inorganics, aluminum, pH, behavior, growth, survival,
larval fish

Description:

OBJECTIVES:

To (1) determine the timing, duration and magnitude of changes in the levels of H⁺, inorganic Al, and other physiochemical characteristics of interstitial water at lake charr spawning sites during spring melt; (2) test, through controlled laboratory experiments, whether embryos can detect and avoid acidic runoff water, and at what concentration of H⁺ and Al (singlely and in combination) avoidance occurs; (3) test in the absence of avoidance response the lethality of acidic runoff water (ie. establish lethal thresholds for pH and Al) for the different life stages of embryos that were observed present during episodic events; (4) test sublethal effect of pulse exposure of different life stages of embryos to low pH (5.0) and elevated Al (0,100, 200 micrograms/liter) on growth, yolk utilization, calcification of the skeleton, and changes in whole body ions (Ca, K, Mg, Na, Cl); and (5) test the effects of observed sublethal effects on the feeding efficiency of emerging alevins as a measure of the reduced survival potential of pulse exposed embryos.

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Ref. no. 52

HARTMAN, W.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

PERFORMANCE OF THREE STRAINS OF LAKE TROUT STOCKED
IN A REFUGE--LAKE MICHIGAN

Starting date: 10/1985

Completion date: 09/1990

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan, northern basin

Keywords:

biology, lake trout, fish, rehabilitation, spawning,
reefs, habitat, refuge, management, stocking, fish strains,
populations, dispersal, growth, survival, temperature,
diet, salmonid, mortality, reproduction

Description:

To ascertain whether a refuge might permit the buildup of a large spawning stock of lake trout, and to determine which of several strains might perform best in Lake Michigan, the Lake Michigan Committee (GLFC) has established a large refuge in the northern part of the lake that will be stocked intensively in spring 1986 with yearling lake trout of three strains. Systematic sampling each year with trawls and gillnets is necessary to collect data on dispersal, growth, survival, depth, and temperature preference, and diet for each strain.

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Ref. no. 53

HATCH, R.W.; BROWN, E.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

SIZE, PRODUCTIVITY, AND HARVESTABLE SURPLUS
OF GREAT LAKES FISH STOCKS

Starting date: 1979

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Lake Superior; Lake Huron

Keywords:

fish, biology, lake trout, bloater chub, whitefish,
populations, management, production, biomass,
commercial fishing, sport fishing

Description:

This work unit provides sophisticated technical assistance in data analysis and population dynamics to and in collaboration with state and provincial DNRs, tribes, etc., for estimating the productivity of selected fish resources and their potential harvestable surplus. Since 1979, and continuing into the foreseeable future, the primary responsibility has been the lead role in working with Michigan DNR and the tribes in annually collecting, collating, and analyzing data on major stocks of lake trout, chubs, and whitefish in treaty-ceded waters of the upper Great Lakes, State of Michigan. This results in annual estimates of population sizes, determination of the status of the stocks, and recommendations for harvestable surpluses the upcoming year.

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Ref. no. 54

HATCH, R.W.; ECK, G.; BROWN, E.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

MAXIMUM SUSTAINABLE PREDATION ON PREY-FISH STOCKS
(GREAT LAKES)

Starting date: 1983

Completion date: 1990

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Lake Huron; Lake Ontario

Keywords:

model, fish, biology, lake trout, salmon, sculpin,
predation, forage base, diet, alewife, smelt

Description:

Comprehensive analytical information on total allowable predation in the Great Lakes would be of great value to management agencies, particularly to those having jurisdiction over Lakes Michigan, Huron, and Ontario, where large salmonid populations are being maintained almost entirely by hatchery stocking. The purpose of this work unit is to use simulation models as well as conventional fishing models, where predation is considered analogous to fishing, to project the effects of changing levels of salmonid predation (1) on Lake Michigan alewife populations, (2) on the composite forage population of alewives, smelt, and sculpins in Lake Michigan, and (3) on composite forage populations in Lakes Huron and Michigan.

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Ref. no. 55

HAYNES, J.M.

New York - State University of New York, Brockport
Biological Sciences

DISTRIBUTION AND THERMAL HABITATS OF SALMONIDS AND
THEIR PREY IN LAKE ONTARIO

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: State University of New York

Area: Lake Ontario

Keywords:

biology, fish, lake trout, distribution, movement,
habitat, salmonid, predation, radiotagged, alewife,
smelt, chinook salmon, temperature, steelhead, brown trout,
thermocline, monitoring, diet

Description:

To determine seasonal movements and habitats, from 1980-86, 184 salmon and trout were radiotagged; 361 salmonids and 222 alewife and smelt were caught in vertical gill nets. In early spring, all salmonid species except chinook salmon were predominantly found near shore <15 m. deep. As lake temperatures rose above 10 C. and the spring thermocline moved offshore Pacific salmon and steelhead (8-12 C.) remained closer to shore, near bottom and preferred temperatures in spring and summer. In summer lake trout were netted in and below the thermocline region; brown trout were concentrated in the thermocline regardless of absolute depth or temperature; salmon and steelhead were farther offshore and used wider vertical habitats. In 1981-82, rainbow smelt dominated the diets of lake trout and chinook salmon, but alewives were dominant for brown trout. Smelt were netted in and below the thermocline. Salmon and trout species in Lake Ontario appear to minimize resource overlap by using different horizontal, vertical, thermal and forage habitats, especially in summer.

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Ref. no. 56

HEBERT, P.D.N.; BILLINGTON, N.
Ontario - University of Windsor, Windsor
Great Lakes Institute
Department of Biological Sciences

DEVELOPMENT OF A SMALL TISSUE SAMPLE TECHNIQUE FOR
THE RAPID ANALYSIS OF MITOCHONDRIAL DNA IN WALLEYE
AND LAKE TROUT

Starting date: 05/1986

Completion date: 04/1987

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Ontario; Athol Bay; Napenee Bay; Trenton River;
Bay of Quinte; Lake Simcoe; Talbot River

Keywords:

biology, fish, lake trout, walleye, genetics, DNA

Description:

OBJECTIVES:

To clone walleye and lake trout mtDNA. Cloned mtDNA is then used to probe mtDNA in total DNA preparations, obtained from small tissue samples collected from live fish. The ultimate aim is to use this method to survey live fish for mtDNA markers.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 57

HEBERT, P.D.N.; BILLINGTON, N.
Ontario - University of Windsor, Windsor
Great Lakes Institute
Department of Biological Sciences

DISCRIMINATION OF FISH STOCKS USING MITOCHONDRIAL DNA

Starting date: 11/1986
Completion date: 10/1989
* means that date is uncertain
Project no.:
Sponsor: Natural Sciences and Engineering Research Council
of Canada

Area: Lake Michigan; Lake Ontario; Lake Huron; Lake Erie; Lake
Superior; Canadian inland lakes; U.S. inland lakes;
Laboratory

Keywords:
biology, fish, lake trout, genetics, DNA, walleye

Description:
Cloned mtDNA will be used to probe mtDNA in total DNA
preparations from small tissue samples collected from
live fish. Mitochondrial DNA markers will be bred into
hatchery fish and these fish used in introduction
experiments. The final goal will be to engineer specific
genetic markers and introduce them into the mtDNA molecule
of fish, enabling ownership to be established, when these
fish are released into the wild.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 58

HEBERT, P.D.N.; GREWE, P.M.
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Great Lakes Institute
Department of Biological Sciences

MITOCHONDRIAL DNA DIVERSITY AMONG BROOD STOCKS OF THE
LAKE TROUT (SALVELINUS NAMAYCUSH)

Starting date: 04/1984
Completion date: 02/1987
* means that date is uncertain
Project no.:
Sponsor: Great Lakes Fishery Commission

Area: Lake Simcoe; Lake Lewis; Lake Superior; Hare Island;
Atlin Lake (British Columbia); Lake LaBerge (Yukon
Territory); North Knife Lake (Manitoba); Laboratory

Keywords:

biology, fish, lake trout, genetics, DNA, populations,
fish strains, enzymes

Description:

Restriction analysis of mitochondrial DNA was used to identify differences among populations of the lake trout. Mitochondrial DNA was purified from 126 fish representing nine brood stocks along with an additional 47 fish from four natural populations. The seventeen restriction enzymes resolved thirteen mitochondrial clones which fell into three major groups. These clonal groups have a specific distribution: a western lakes group; a central lakes group; and an eastern Great Lakes Group. These results indicate that mt-DNA markers have great potential for the identification and management of lake trout strains.

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Ref. no. 59

HELWIG, D.D.

Minnesota - Minnesota Pollution Control Agency, St. Paul

FISH CONTAMINANT MONITORING

Starting date: 1982

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Minnesota Pollution Control Agency

Area: Lake Superior; South of Hat Point (Grand Portage); South of Terrace Point (Grand Marais); Southeast of French River County; East of Beaver Bay County; Southwest of Split Rock County

Keywords:

biology, fish, lake trout, siscowet, chinook salmon, monitoring, chemistry, lipids, organics, PCBs, TCDD, trace metals, mercury, aluminum, arsenic, cadmium, chromium, copper, nickel, lead, toxics, contaminants, human health, human consumption

Description:

OBJECTIVES:

To (1) monitor contaminants in fish; (2) detect trends of contaminants of fish; (3) detect sources of contaminants; and (4) set limits of fish consumption by people.

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Ref. no. 60

HENDERSON, B.A.; FRY, F.E.J.

Ontario - Ministry of Natural Resources, Maple
Fisheries Branch;
Ontario - University of Toronto, Toronto
Department of Zoology

UTILITY OF LONG-TERM STUDIES FOR UNDERSTANDING COMMUNITY
STRUCTURE AND FUNCTION WITH PARTICULAR REFERENCE TO LAKE
TROUT IN LAKE HURON

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Huron

Keywords:

biology, fish, lake trout, abundance, populations,
biomass, habitat, competition

Description:

To assess whether recent changes in the structure of the fish community in South Bay, Lake Huron were best explained by inter- or intra-specific factors, open-lake and bay fish communities with different abundances of lake trout were compared. Abundances of whitefish, yellow perch, alewife, and white suckers were best explained by intraspecific factors, namely density dependent recruitment, water levels, water temperature, and lamprey parasitism, respectively. Based on cluster analysis, using interspecific correlations of relative abundances, species tended to apportion the habitat thermally and spatially. Though lake trout populations declined in both the open-lake and bay communities, total biomass decreased in the open-lake and increased in the bay. These different outcomes most probably result from two communities, most likely related to differences in species interactions in the spatial relations within the cold- and cool-water communities. Although it appears that intraspecific interactions control the abundance of most common species, long-term studies, such as these, could benefit from an early statement of hypothesis, resulting in more intensive sampling of the relevant species.

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Ref. no. 61

HENRY, M.; FOSTER, N.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

FOOD PREFERENCE AND FEEDING EFFICIENCY
OF DIFFERENT LAKE TROUT STRAINS

Starting date: 01/1970

Completion date: Continuing

* means that date is uncertain

Project no.: 973.7511

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, diet, fish strains, habitat,
genetics, larval fish, survival, forage base

Description:

Available evidence suggests that although adult lake trout are reproducing in the Great Lakes, proportionately very few fry are surviving to a size vulnerable to routine assessment gear. Since strain specific food preference and feeding efficiency may not correspond to the abundance and types of plankton supplies available at time of first feeding (post yolk absorption), meaningful evaluations and recommendations regarding the appropriateness of specific strains to bring about recruitment require comparison of the feeding requirements of the fish with the availability of forage in the habitat planned for stocking. This behavioral information will be combined with that from the genetic/physiological strain characterizations being performed in other work units in order to more fully delineate differences between strains.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 62

HESS, R.

Illinois - Illinois Department of Conservation, Chicago
Lake Michigan Program

FISHERIES SURVEYS AND STUDIES ON LAKE MICHIGAN

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Illinois Department of Conservation

Area: Lake Michigan, Illinois waters

Keywords:

biology, fish, lake trout, salmonid, mortality,
yellow perch, monitoring, rainbow trout, sport fishing,
commercial fishing, creel census, bloater chub

Description:

The Lake Michigan Program includes an annual array of lake surveys: bloater chub, yellow perch, lake trout, salmonids. In addition, a sport fishing creel census is conducted with the INHS (see Gorden, G.; Horns, W.). Studies are being conducted with experimental gill nets in an effort to reduce catch and mortality of trout and salmon caught in such nets which are set for yellow perch and bloater chubs. Also monitored are a) the catches of floy-tagged rainbow trout which were released in summer and b) the charter boat and commercial catches from Illinois waters.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 63

HESS, R.; VIDAL, P.; TRUDEAU, T.
Illinois - Illinois Department of Conservation, Chicago

LAKE TROUT INVESTIGATIONS

Starting date: 07/01/1984
Completion date: continuing
* means that date is uncertain
Project no.:
Sponsor: Illinois Department of Conservation

Area: Lake Michigan; Julian's Reef; Illinois waters

Keywords:

biology, fish, lake trout, monitoring, spawning,
reproduction, reefs, fish strains

Description:

Lake Superior and Lake Seneca strains (marked fish)
are released annually at Julian's Reef. Annual monitoring
of stock status off Waukegan and spawning status at
Julian's Reef.

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Ref. no. 64

HESSELBERG, R.; HICKEY, J.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

SURVEILLANCE OF CONTAMINANTS IN GREAT LAKES FISHES

Starting date: 1977

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish Wildl. Serv.; Int. Jt. Comm.;
U.S. EPA--Great Lakes

Area: Lake Michigan; Lake Superior; Lake Huron; Lake Erie;
Lake Ontario

Keywords:

contaminants, toxics, fish, biology, water quality,
organics, DDT, PCBs, dieldrin, toxaphene, chlordane,
lake trout, walleye, monitoring, pesticides

Description:

This work covers monitoring and research activities performed under cooperative agreement with U.S. EPA in fulfillment of the U.S./Canadian "International Great Lakes Fish-Contaminant Surveillance Program" as coordinated by the IJC Surveillance Subcommittee. Also included are cooperative efforts with the U.S.F.W.S. National Contaminant Biomonitoring Program. The U.S. portion of the International Program consists of the GLFL annually collecting samples of 2 species of fish from each of 6 locations in the Great Lakes and Lake St. Clair, with analysis of major contaminants in 120 composite samples by the U.S. EPA (trend monitoring). The GLFL further performs quality assurance analysis and analyzes composite samples of the largest predatory fish collected for other detectable organic and inorganic contaminants (new contaminant identification).

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Ref. no. 65

HITES, R.; SWACKHAMER, D.
Indiana - Indiana State University, Bloomington
Chemistry Department

ATMOSPHERIC TRANSPORT OF ORGANICS TO FISH POPULATIONS
IN SISKIWIT LAKE

Starting date: 1986

Completion date: 1986

* means that date is uncertain

Project no.:

Sponsor: U.S. Environmental Protection Agency

Area: Siskiwit Lake; Isle Royale; Lake Superior

Keywords:

biology, fish, lake trout, chemistry, organics,
PCBs, monitoring, whitefish, bioaccumulation,
partition coefficients, toxaphene, DDE, octachlorostyrene,
chlordane, nonachlor, mirex, pentachloroanathol, dieldrin,
heptachlor epoxide, dachtal, benzene hexachloride,
DPEs, oxychlordane, pesticides, age, atmospheric,
toxics, contaminants

Description:

This project examined the content of chlorinated pesticides and industrial compounds in 3 age classes of lake trout and whitefish in Siskiwit Lake. This lake is land-locked and the input of contaminants is through atmospheric pathways. The three major contaminants in the fish were PCBs, DDE, and toxaphene with 12 others found in lesser amounts. The data was analyzed to determine relationships between certain characteristics, contaminant uptake, and characteristics of the chemicals.

Bioaccumulation rates (BCF's) were related to octanol-water partition coefficients for some of the organic compounds but not for PCBs.

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Ref. no. 66

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Limnology Section;
Ontario - University of Toronto, Toronto

LETHAL PH AND ALUMINUM THRESHOLDS FOR NATIVE ONTARIO FISH SPECIES,
AND FACTORS THAT MODIFY ALUMINUM ION TOXICITY

Starting date: 04/01/1983
Completion date: 03/31/1986
* means that date is uncertain
Project no.:
Sponsor: Ontario Ministry of the Environment

Area: Laboratory

Keywords:

biology, fish, lake trout, eggs, larval fish, walleye, pH,
white sucker, brook trout, lake whitefish, smallmouth bass,
largemouth bass, common shiner, redbelly dace, water quality,
aluminum, chemistry, acid rain, inorganics, toxics

Description:

OBJECTIVES:

To (1) determine the lethal thresholds of H+
and aluminum to early life stages of native
Ontario fish species; and (2) identify
sensitive species and life stages for use as
early biotic indicators of advancing acidification.

METHODOLOGY:

Early life stages (up to 4 egg stages, 4 fry stages
and 2 juvenile stage) of each species (walleye,
white sucker, brook trout, lake trout, lake whitefish,
smallmouth bass, largemouth bass, common shiner,
redbelly dace) were tested in the laboratory with
a possible 24 combinations of pH and aluminum.

RATIONALE:

Since these studies are related to the effects of
acid rain on the environment, they may only be of
marginal interest to Great Lakes lake trout
management efforts, given the non-sensitivity of
the Great Lakes to acid rain. However, since near
shore spawners may be impacted by snowmelt and
associated low pH, high aluminum concentrations
and low calcium, the results by be of interest.

Contact:

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Dorset Research Centre
Limnology Section
P.O. Box 213

Revised ON MOW 511

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 67

HORNS, W.; GORDEN, R.

Illinois - Natural History Survey, Champaign

SOURCE, FATE, AND ABUNDANCE OF LAKE TROUT EGGS ON
JULIAN'S REEF

Starting date: 7/01/1986

Completion date: 6/30/1988

* means that date is uncertain

Project no.:

Sponsor: Illinois Department of Conservation

Area: Lake Michigan, Illinois waters; Julian's Reef

Keywords:

biology, fish, lake trout, eggs, larval fish, substrate,
habitat, spawning, rehabilitation, reefs

Description:

This project will examine whether mature lake trout observed aggregating on Julian's Reef are depositing eggs on the reef, whether eggs are deposited on suitable substrates, and what percentage of the deposited eggs survive to emergence. This study should help to determine why lake trout have failed to reproduce in Lake Michigan.

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Dr. William Horns

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Ref. no. 68

HORRALL, R.

Wisconsin - University of Wisconsin, Madison
Marine Studies Center

STUDIES ON THE EARLY LIFE HISTORY AND RECRUITMENT
OF FERAL AND NATIVE LAKE TROUT, WITH SPECIAL EMPHASIS
ON EXPERIMENTALLY PLANTED EGGS AND ALEVINS

Starting date: 9/01/1985

Completion date: 8/31/1989

* means that date is uncertain

Project no.: R/LR-32

Sponsor: Wisconsin Sea Grant

Area: Lake Michigan; Lake Superior

Keywords:

fish, spawning, reefs, biology, reproduction, behavior,
recruitment, lake trout, eggs, imprinting, aquaculture,
larval fish

Description:

OBJECTIVES:

To (1) continue to operate two experimental lake trout hatcheries; (2) study the early life history of lake trout which have been experimentally planted on traditional reefs as alevins or as eggs; (3) study the early life history of native (Gull Island Shoal) and feral (Clay Banks-Black Can) populations of lake trout; (4) study the behavior of lake trout alevins and fry in the laboratory; and (5) continue to study site imprinting mechanisms in young lake trout.

METHODOLOGY:

Techniques include observations by scuba divers, underwater TV, netting gear ("spider" nets, trawls, emergence traps), experimental hatcheries, laboratory aquarium experiments, Y-maze experiments and the use of a very large indoor tank.

RATIONALE:

Presently, early life history information on lake trout (egg through yearling stages) is inadequate for testing hypotheses concerning the reproductive failure of planted hatchery-reared fish. The early life history of lake trout will be studied in order to better understand the process of recruitment occurring in native vs. feral stocks.

ACCOMPLISHMENTS:

The Kewaunee and Milwaukee experimental lake trout hatcheries have been filled with 2.2

well house for swim-up fry experiments and for
the spring (1986) alevin plants on Horseshoe Reef.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 69

HORRALL, R.

Wisconsin - University of Wisconsin, Madison
Marine Studies Center

ARTIFICIAL IMPRINTING OF LAKE TROUT AS A
REHABILITATION TECHNIQUE

Starting date: 9/01/1986

Completion date: 8/31/1989

* means that date is uncertain

Project no.: R/LR-34

Sponsor: Wisconsin Sea Grant Institute

Area: Lake Michigan; Wisconsin Hatcheries

Keywords:

biology, fish, lake trout, reefs, imprinting, spawning,
aquaculture, rehabilitation, reproduction, homing

Description:

OBJECTIVES:

To (1) examine the feasibility of artificial imprinting and decoy techniques to increase the effectiveness of the existing lake trout rehabilitation program; (2) evaluate the potential of several natural and synthetic substances, besides phenethyl alcohol, for use as artificial imprintants; (3) determine the degradation chemistry for phenethyl alcohol and other selected imprintants in aquatic systems; and (4) develop techniques for scenting reefs to more effectively attract imprinted fish.

METHODOLOGY:

Artificial imprinting (in hatcheries) and decoy (in lakes) techniques, the use of chemosensory imprintants, computer simulations of odor plumes, experimental hatcheries, "Y" mazes and development of constant release devices for imprintants.

RATIONALE:

Presently, hatchery-reared yearling lake trout being stocked into the Great Lakes are not reproducing successfully. The introduction of artificial imprinting techniques into current hatchery and stocking programs may lead to increased homing to traditional spawning sites, which will enhance natural reproduction and the development of self-sustaining stocks.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 70

HORRALL, R.; KEILLOR, P.

Wisconsin - University of Wisconsin, Madison
Marine Studies Center;
Wisconsin - University of Wisconsin, Madison
Sea Grant Institute

FACTORS INFLUENCING THE REESTABLISHMENT OF SELF-
SUSTAINING STOCKS OF LAKE TROUT IN LAKE MICHIGAN

Starting date: 3/01/1978
Completion date: 8/31/1985
* means that date is uncertain
Project no.: R/GB -07
Sponsor: Wisconsin Sea Grant

Area: Lake Michigan; Green Bay

Keywords:

fish, biology, reproduction, reefs, imprinting, bioassay,
behavior, spawning, lake trout, water quality, homing,
rehabilitation, aquaculture, eggs,
larval fish, survival

Description:

OBJECTIVES:

To (1) operate two experimental lake trout hatcheries to bioassay egg and fry survival, study fry behavior and methods of planting eggs and/or sac fry for rehabilitating lake trout on reefs; (2) study homing behavior of lake trout planting on offshore reefs in Green Bay and Lake Michigan; and (3) identify the critical period in lake trout for site imprinting and assess the effectiveness of artificial imprinting in the trout.

METHODOLOGY:

Techniques include artificially imprinting lake trout, phenethyl alcohol decoy sites, trap nets, experimental lake trout hatcheries, current and temperature analysis.

RATIONALE:

This project is designed to investigate some of the possible reasons for the failure of lake trout to reproduce successfully in Lake Michigan - particularly those relating to the behavioral mechanisms of spawning site selection, to different stocking methods and to environmental factors influencing spawning.

ACCOMPLISHMENTS:

Incubated over 1.8 million lake trout eggs from several strains in two hatcheries; after hatching, used alevins and fry for behavioral and imprinting and microcontaminant studies and for experimental stocking on reefs to study natural imprinting, natal

analysis on current-temperature meter data from three traditional lake trout spawning reefs; published research on the history of brood stocks and the strategy for the use of lake trout strains.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 71

HUGHES, D.N.

Ontario - Ministry of Natural Resources, Owen Sound
Lake Huron Fisheries Assessment Unit

PAIRED PLANTING OF LAKE TROUT AND LAKE TROUT BACKCROSS

Starting date: 1986

Completion date: 1995

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Huron; southern Georgian Bay

Keywords:

biology, fish, lake trout, monitoring, survival,
growth, movement, sea lamprey wounding

Description:

Comparison of survival, growth, maturation, longevity,
movements, marking by sea lamprey, returns to fishery, etc.,
of lake trout and backcross stocked as yearlings (equal
numbers planted).

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 72

HUGHES, D.N.

Ontario - Ministry of Natural Resources, Owen Sound
Lake Huron Fisheries Assessment Unit

ASSESSMENT OF LAKE TROUT BACKCROSS

Starting date: 1979
Completion date: Continuing
* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Huron; southern Georgian Bay (Cape Rich);
eastern North Channel (Heywood Island)

Keywords:

biology, lake trout, fish, survival, monitoring,
growth, sea lamprey wounding, reproduction,
abundance, diet, fish strains

Description:

Annual assessment gillnetting in August 1986 for lake trout backcross at Heywood Island resulted in a catch of 380 backcross, for a CUE about 35% less than that from 1985. The lower catch rate likely reflected reduced catchability (partly due to fishing in below optimal temperature) rather than any decrease in abundance. Two- and three-year-old fish together made up 87% of the prorated backcross catch, and yearlings represented only 5.4%, a much smaller proportion than in previous years. Estimates of total mortality ranged from 27.8% for age 2 to 3 up to 91.4% for age 3 to 4, but were of questionable accuracy due to the apparent catchability problem.

Age 2 backcross from the cage culture project were well represented in the catch, with a CUE of 1.86 per 1000 planted, compared with 0.84 for hatchery reared two-year-olds. Sample sizes were too small to evaluate the performance of yearling cage culture backcross planted as fall fingerlings and spring yearlings.

Other information presented included maturity data, stomach contents, and lamprey markings.

Report for Georgian Bay out in April.

Contact:

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Ref. no. 73

IHSSEN, P.E.

Ontario - Ministry of Natural Resources, Maple
Fisheries Research Section

PHYSIOLOGICAL DIFFERENTIATION OF LAKE TROUT STOCKS

Starting date: 1985

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Manitou; Lake Huron; Haliburton Highlands

Keywords:

biology, fish, lake trout, genetics, growth,
fish strains, reproduction, spawning

Description:

Genetic differences in growth rate and age of maturation
among lake trout stocks have been found. There is interest
in looking at environmental and genetic interactions.

Contact:

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Ref. no. 74

IHSSEN, P.E.

Ontario - Ministry of Natural Resources, Maple
Fisheries Research Section

MORPHOLOGICAL DIFFERENTIATION OF LAKE TROUT STOCKS

Starting date: 1981

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Ontario; Lakes in southern Ontario

Keywords:

biology, fish, lake trout, morphology, growth,
fish strains, genetics, aquaculture

Description:

Study of the environmental and genetic control
of morphological variation in lake trout stocks,
effects of transplanting, hatchery rearing.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 75

IHSSEN, P.E.; MARTIN, G.W.

Ontario - Ministry of Natural Resources, Maple
Fisheries Research Section

BIOCHEMICAL GENETIC DIFFERENTIATION OF LAKE TROUT

Starting date: 04/1983

Completion date: 04/1987

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Superior; Lake Huron; 23 inland Canadian lakes

Keywords:

biology, fish, lake trout, genetics, distribution,
populations, fish strains

Description:

OBJECTIVES:

To gain a better understanding of the genetic differentiation of sympatric and allopatric lake trout stocks. We found genetic differentiation that is useful for identifying different wild and hatchery stocks of lake trout.

Contact:

Dr. Peter Ihssen
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Ref. no. 76

IHSSEN, P.E.; MARTIN, G.W.
Ontario - Ministry of Natural Resources, Maple
Fisheries Research Branch

GENETIC MARKING OF LAKE TROUT

Starting date: 1984
Completion date: Continuing
* means that date is uncertain
Project no.:
Sponsor: Ontario Ministry of Natural Resources

Area: Laboratory

Keywords:
biology, fish, lake trout, genetics, eggs,
fish strains, larval fish, aquaculture

Description:
Genetically marked lake trout are being produced for
egg and fry plantings in life stages that cannot be
marked by conventional methods.

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Ref. no. 77

ILLINOIS EPA.

Illinois - Illinois Environmental Protection Agency, Springfield
Division of Water Pollution Control

COOPERATIVE FISH CONTAMINANT MONITORING PROGRAM

Starting date: 1977
Completion date: Continuing
* means that date is uncertain

Project no.:

Sponsor: Illinois Environmental Protection Agency, Clean
Water Act

Area: Lake Michigan; Trident Harbor; Waukegan Harbor; Great
Lakes Naval Station Harbor; Montrose Harbor; Diversey
Harbor; Jackson Harbor

Keywords:

biology, fish, lake trout, chemistry, contaminants,
toxics, human health, water quality, tributaries,
monitoring, organics, PCBs, chlordane, dieldrin,
DDT, heptachlor expoxide, benzene hexachloride,
heptachlor, endrin, yellow perch, smelt, coho salmon,
rainbow trout, brown trout, carp

Description:

OBJECTIVES:

To (1) investigate and detect the presence and
build-up of toxic and potentially hazardous
substances in fish, encompassing both fish
toxicity and public health implications;
(2) determine the impact of fish contaminants
upon the suitability of aquatic environments for
supporting abundant, useful, and diverse
communities of fish life in streams and impoundments
of Illinois; and (3) aid in the location of sources
of toxic material discharges and evaluate long-term
effects of source controls and land use changes.

METHODOLOGY:

Composite filet samples from Lake Michigan are
obtained for lake trout. Four composite filet
samples are prepared based upon the ranges of six
at the time of collection. A composite filet
sample from Lake Michigan consists of at least
5 fish per size group. For lake trout, 20 inches,
21-25 inches and 25 inches are the size groups.

Contact:

Illinois Environmental Protection Agency
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Springfield, IL 62707
(217) 782-2207

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 78

IRON RIVER NATIONAL FISH HATCHERY.

Wisconsin - Iron River National Fish Hatchery, Iron River

THE EFFECTS OF HATCHERY REARING DENSITY ON POST-STOCKING
PERFORMANCE OF LAKE TROUT

Starting date: 02/01/1987

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Sheboygan Reef

Keywords:

biology, fish, lake trout, aquaculture, density, reefs,
fish strains, monitoring, rehabilitation

Description:

Two strains of lake trout will be reared at three densities each, coded-wire tagged and stocked in a controlled refuge in Lake Michigan. Post stocking performance will be monitored through assessment data collected by the Great Lakes Fish Commission. Differences could be used to optimize hatchery production of lake trout used in the rehabilitation program.

Contact:

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Iron River National Fish Hatchery
HCR Box 44
Iron River, WI 54847

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 79

JANSSEN, J.; SAVITZ, J.
Illinois - Loyola University, Chicago
Biology Department

FOOD HABITS OF LAKE MICHIGAN SALMONIDS IN ILLINOIS WATERS

Starting date: 6/01/1983
Completion date: 4/30/1987
* means that date is uncertain
Project no.: R/F-03
Sponsor: Illinois/Indiana Sea Grant

Area: Lake Michigan, Illinois waters; Waukegan Harbor;
Burnham Harbor; Evanston Harbor; Chicago Harbor

Keywords:

fish, lake trout, diet, biology, salmonid,
predation, forage base, coho salmon, chinook salmon

Description:

OBJECTIVES:

To (1) determine diet composition of salmonids in the Illinois waters of Lake Michigan on a seasonal and locale basis; (2) determine the relationship between predator size and prey size for the various salmonids; (3) compare stomach contents with previous studies and concurrent studies for Wisconsin, Michigan, and Indiana waters of Lake Michigan.

METHODS:

Sample salmonid stomach contents at least 3 weekends a month at Waukegan and Burnham Harbors from end of April until at least mid-Sept. Stomach samples will be preserved in formalin and analyzed in the lab. Lengths and weights of the salmon (before cutting) and the intact prey are recorded for calculation of condition factors.

ACCOMPLISHMENTS:

Salmonid stomachs have been collected and analyzed (482 in 1984, 380 in 1983). Results have been sent to the Coordinator, Great Lakes Sea Grant Network Study Project, disseminated through Sea Grant and other publications and reported on at several workshops. The 1985 data should be ready in early January.

Contact:

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Ref. no. 80

JOHNSON, A.; VAILLANCOURT, A.; COX, C.
Ontario - Ontario Ministry of the Environment, Toronto
Aquatic Contaminants Section
Water Resources Branch

GUIDE TO EATING ONTARIO SPORT FISH (GEOSF)

Starting date: 1977
Completion date: continuous annual publication
* means that date is uncertain
Project no.:
Sponsor: Ontario Ministry of Natural Resources

Area: Lake Superior; Lake Erie; Lake Huron; Lake Ontario;
Other bodies of water throughout Ontario

Keywords:

biology, fish, lake trout, chemistry, organics,
contaminants, toxics, mirex, pesticides, DDT,
dioxin, inorganics, mercury, lead, human consumption,
human health

Description:

Edible portion fillets are tested for various contaminants,
and the results are published in the form of consumption
guidelines (GEOSF) for approximately 50 species, including
lake trout.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 81

KAPUSCINSKI, A.R.

Minnesota - University of Minnesota, St. Paul
Department of Fisheries and Wildlife

ESTIMATION OF GENETIC PARAMETERS FOR FITNESS
RELATED TRAITS OF LAKE TROUT (SALVELINUS NAMAYCUSH)

Starting date: 10/01/1985

Completion date: 10/01/1988

* means that date is uncertain

Project no.: R/A-4

Sponsor: Minnesota Sea Grant College Program

Area: Lake Superior; Inland lakes of Minnesota; Laboratory

Keywords:

genetics, biology, aquaculture, fish strains, fitness,
populations, fish, lake trout

Description:

OBJECTIVES:

To determine (1) the differences between lake trout stocks with regard to the degree of both genetic and environmental control of the variation in fitness related traits; (2) the relative contributions of additive and nonadditive gene action to the genotypic variation of evaluated traits; (3) genetic correlations among the evaluated traits; and (4) strains most suitable for stocking in particular environments, e.g., Lake Superior and inland lakes in Minnesota.

METHODOLOGY:

Make a p x p diallel cross among reproductively isolated strains of lake trout. Collect data for various traits from progeny of all crosses (reared from fertilized eggs to age 2-3 under controlled hatchery environments).

ACCOMPLISHMENTS:

Six lake trout stocks (both wild and hatchery stocks) were crossed in two sets of 3 x 3 diallels with ten replicates per set. Families have been raised from fertilized eggs through age one in a controlled environment. Data was collected from families or individuals for survival, growth, lipid content, frequency of development abnormalities and related traits.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 82

KENYON, R.B.; LORANTAS, R.
Pennsylvania - Pennsylvania Fish Commission, Fairview
Lake Erie Research Unit

MONITORING AND INVENTORY OF LAKE ERIE FISH STOCKS

Starting date: 1971
Completion date: Continuing
* means that date is uncertain
Project no.:
Sponsor: Pennsylvania Fish Commission

Area: Lake Erie, Pennsylvania waters

Keywords:

biology, fish, lake trout, monitoring, growth, diet,
sea lamprey wounding, populations, management, distribution

Description:

Lake trout are collected and analyzed for age, maturity, growth, diet, condition, and lamprey wounds. Laboratory studies include specimen dissection, code wire tag removal, aging and data analysis. Field sampling includes study of distribution.

Contact:

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Lake Erie Research Unit
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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 83

KEVERN, N.; ELLIOTT, R.

Michigan - Michigan State University, East Lansing
Department of Fisheries and Wildlife

FEEDING HABITS AND GROWTH OF SALMONINES IN
EASTERN LAKE MICHIGAN

Starting date: 1983

Completion date: 1986

* means that date is uncertain

Project no.: 1983

Sponsor: Sponsor Not Known

Area: Lake Michigan

Keywords:

fish, diet, lake trout, salmon, trout, alewife,
rainbow smelt, yellow perch, forage base, salmonid,
biology, populations, predation, size, bloater chub

Description:

Salmonine utilization of a dynamic forage base, variation in salmonine size at age, and relation between size variation and forage base structure were assessed using angler-caught salmon and trout from eastern Lake Michigan from 1983-1986. Sampling was done on a regular basis at 15 different ports between New Buffalo and Charlevoix throughout the four-year study. Stomach contents and size characteristics were analyzed for each of 10,670 salmonines sampled. Zooplankton, terrestrial insects, and four species of fish--alewife, bloater chub, rainbow smelt, and yellow perch--were found to be the six dominant forage items. The importance of the fish species other than alewife in the diets parallels reported changes in forage species populations and indicates opportunistic feeding by the predators. Specific findings from these data of diet composition and variation of salmonine size over the four year study indicate trends that should be considered when assessing the future stability of Lake Michigan's valuable fisheries resource.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 84

KINCAID, H.L.

Pennsylvania - National Fish Research and Development
Laboratory (NFRDL), Wellsboro

INHERITANCE OF CATARACT IN LAKE TROUT

Starting date:

Completion date: 1986

* means that date is uncertain

Project no.: 972-82.16

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, genetics, biochemistry,
bioassay, aquaculture, fish strains

Description:

A second year class of individual cataract test families (2x2 design of cataract and non-cataract parents) was produced in the fall of FY 86. Survey of NFRDL FY 83 and Allegheny NFH FY 85 lake trout strains for cataract and eye abnormalities showed strain differences in nuclear cataract frequency at both Allegheny NFH (range 7.3 to 34.7%) and NFRDL (range 1.2 to 3.4%). The Superior strain showed the lowest frequency of total eye abnormalities and nuclear cataracts at both locations.

Contact:

Dr. Harold L. Kincaid
U.S. Fish and Wildlife Service
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Wellsboro, PA 16901
(717) 724-3322

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 85

KINCAID, H.L.; MARSDEN, J.E.
Pennsylvania - National Fishery Research and Development
Laboratory (NFRDL), Wellsboro

LAKE TROUT STRAIN CHARACTERIZATION DATA BASE

Starting date:
Completion date: 1986
* means that date is uncertain
Project no.: 972-82.14
Sponsor: U.S. Fish and Wildlife Service

Area: Lake Ontario; Laboratory

Keywords:
biology, fish, lake trout, bioassay, biochemistry,
enzymes, genetics, aquaculture, fish strains

Description:
Continued NFRDL performance evaluation of three FY 83 lake trout strains through the fourth year and four FY 85 strains through the second year (Seneca, Jenny Lake, Superior and Clear Water). Completed electrophoretic characterization of NFRDL strains. Inheritance of duplicate fumarate and phosphoglucomutase loci in lake trout. Lake Ontario Lake Trout Restoration Plan involves the evolution of a "synthetic" Ontario strain by systematic stocking to establish an adult population.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 86

KITCHELL, J.

Wisconsin - University of Wisconsin, Madison
Center for Limnology

SALMONID DIET SURVEY

Starting date: 9/01/1984
Completion date: 8/31/1986
* means that date is uncertain
Project no.: R/LR-28
Sponsor: Wisconsin Sea Grant

Area: Lake Michigan

Keywords:

model, fish, biology, predation, forage base, alewife, salmonid, populations, diet, lake trout, chinook salmon, coho salmon, smelt, perch, sculpin, bioenergetics, bloater chub

Description:

OBJECTIVES:

To (1) test several hypotheses concerning the predator-prey interaction of Lake Michigan salmonids with their forage base: a) that alewives will decline in Lake Michigan as the result of salmonid predation, b) that this will result in a shortage of forage for salmonids, c) that salmonids will shift to other forage fish as a food source; (2) define indicators of the intensity of use of the forage resources by predators; and (3) compare results to those of other salmonid diet studies on the Great Lakes.

METHODOLOGY:

Collect and analyze stomach contents of sport-caught salmonids in Lake Michigan. Coordinate similar projects in Minnesota, Illinois-Indiana, Michigan and New York Sea Grant programs and province of Ontario.

RATIONALE:

Evidence suggests that community structure in Lake Michigan is in a period of transition. It is an ideal time to collect information to test hypotheses and to guide management decisions. Sampling sport-caught fish for information in order to assess changes in fish resources and as a basis for development of management plans can be easily accomplished.

ACCOMPLISHMENTS:

Energetics modeling simulations indicated that 40-60% of total annual predation by coho and chinook salmon and lake trout occurs during May through August. During 1982-86, % (wet weight)

70-92% for coho, 80-93% for chinook and 65-92% for lake trout, highest % alewife values for all three species were observed in 1986. The second most important prey fish was smelt, followed by perch, bloaters, and slimy sculpins. Seasonal trends consistently showed greater diet diversity in late summer with Pacific salmon consuming proportionately more smelt and perch, and lake trout consuming more smelt, bloaters, and sculpins. Chinooks consumed large numbers of young perch during upwelling events in Aug. 1985. Absence of a downward trend in % alewives in the diets of these 3 salmonine predators in spite of a major lake-wide decline in the alewife population suggests either a very strong preference for alewives or, perhaps, an underestimation of alewife abundance in Lake Michigan.

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Ref. no. 87

KITCHELL, J.; STEWART, D.
Wisconsin - University of Wisconsin, Madison
Center for Limnology

PREDATOR-PREY SYSTEMS IN THE GREAT LAKES

Starting date: 9/01/1984
Completion date: 8/31/1988
* means that date is uncertain
Project no.: R/LR-29
Sponsor: Wisconsin Sea Grant

Area: Lake Michigan; Lake Ontario; Lake Huron; Lake Erie;
Lake Superior

Keywords:

model, biology, fish, paleolimnology, sediment,
bioenergetics, forage base, salmonid, alewife,
lake trout, predation, diet, carrying capacity,
competition, zooplankton, pink salmon

Description:

OBJECTIVES:

To (1) estimate response characteristics of the Great Lakes trophic system to changes in predation level; (2) quantify impact on the forage base of predation by various combinations and densities of salmonid predators; (3) to investigate the interactive effect of predation and competition on the resiliency of alewife stocks; and (4) develop paleoecological perspectives that will help create realistic expectations of the carrying capacity of Great Lakes trophic systems.

METHODOLOGY:

This study will use computer simulation with bioenergetics models in combination with paleoecological analysis of bottom sediments to recreate and project predator-prey interactions in Lake Michigan.

RATIONALE:

There is a need to understand predator-prey interactions in Lake Michigan for several reasons: the shifting composition of the forage base for salmonid predators; the alewife's uncertain status; pressure to increase stocking and shift management emphasis to trophy species; and the changing status of lake trout, stream-run salmonids and pink salmon in the lake.

ACCOMPLISHMENTS:

Since 1 September 1984: Three papers and one book chapter published or in press; one master's thesis completed; three manuscripts submitted and two others

BENEFITS:

Information from this study will be useful to those agencies involved in the management of Lake Michigan sport and commercial fishes, especially in the evaluation of alternative stocking policies. It will complement concurrent studies of forage fishes, salmonid diets and other predator-prey systems in Lake Michigan. The approach can be extended to predator-prey systems in the other Great Lakes and to marine systems.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 88

KRISE, W.F.

Pennsylvania - National Fish Research and Development
Laboratory (NFRDL), Wellsboro

LONG-TERM EFFECTS OF SUPERSATURATION ON ATLANTIC SALMON
AND LAKE TROUT

Starting date: *

Completion date: 1986

* means that date is uncertain

Project no.: 972-83.14

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, Atlantic salmon, eggs,
biochemistry, survival, growth, larval fish, aquaculture

Description:

The effects of chronic gas supersaturation of eggs
sac-fry and alevins are being studied. Survival and
growth were not different up to 111% total gas. A lake
trout immune response test is in progress. Research has
been broken into 4 discrete work units for FY 87.
A second Atlantic salmon study at a higher temperature
will also be done in FT 87.

Contact:

William F. Krise
U.S. Fish and Wildlife Service
National Fishery Research and Development Laboratory
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Wellsboro, PA 16901
(717) 724-3322

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 89

KRUEGER, C.C.; MAY, B.; GLOSS, S.; MARSDEN, J.E.

New York - Cornell University, Ithaca
Department of Natural Resources;New York - Cornell University, Ithaca
Section of Ecology and Systematics;New York - Cornell University, Ithaca
New York Cooperative Fish Unit;New York - Cornell University, Ithaca
Department of Natural ResourcesGENETIC IDENTIFICATION OF THE PARENTAL ORIGINS OF
NATURALLY PRODUCED LAKE TROUT FRY CAPTURED FROM LAKE ONTARIO

Starting date: 10/01/1984

Completion date: 12/31/1986

* means that date is uncertain

Project no.: R/F-40

Sponsor: U.S. Fish and Wildlife Service,
New York Sea Grant Institute

Area: Lake Ontario, eastern basin near Stony Island

Keywords:

biology, fish, lake trout, genetics, enzymes, larval fish,
origin, fish strains

Description:

OBJECTIVES:

To (1) describe allozyme variations in lake trout;
(2) confirm the genetic basis to variation;
(3) describe variation in hatchery strains; and
(4) determine parental origins of lake trout fry
by mixed stock analysis.

RATIONALE:

By providing a routine method for determining the
parental origin of lake trout fry, this project
will be of use to agencies that are seeking to
reestablish lake trout in the Great Lakes by
making it easier to determine which lake trout
strain(s) are naturally reproducing.

ACCOMPLISHMENTS:

Selective mating of adult hatchery-reared lake trout
of known genotype accomplished. Electrophoretic
examination of these fish uncovered 15 polymorphic
loci. Tissues of fry from these matings now being
analyzed for comparison with parents in
inheritance analysis. Electrophoretic examination
of yearling trout from 1983 and 1984 Lake Ontario
year classes completed. Adult lake trout from 7
strains have been compared for allele
frequencies and heterozygosity estimates.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 90

LANKESTER, M.W.
Ontario - Lakehead University, Thunder Bay
Department of Biology

SWIMBLADDER NEMATODES OF LAKE TROUT

Starting date: 1978

Completion date: 1985

* means that date is uncertain

Project no.:

Sponsor: Natural Sciences and Engineering Research Council
of Canada

Area: Lake Superior, north shore; inland lakes of Northwestern
Ontario

Keywords:

biology, fish, lake trout, parasites,
populations, *Cystidicola*

Description:

The population dynamics of the parasite *Cystidicola* spp.
is studied as it relates to infection of lake trout.

Contact:

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Lakehead University
Thunder Bay, ON P7B 5E1
(807) 345-2121

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 91

LOFTUS, A.; KELLER, M.

Michigan - Michigan State University, East Lansing
Michigan - Michigan Department of Natural Resources, Lansing

EVALUATION OF LAKE TROUT HOOKING MORTALITY IN THE
UPPER GREAT LAKES

Starting date: 1985

Completion date: 1986

* means that date is uncertain

Project no.: F-53-R, Study 526

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Michigan; Lake Huron; Lake Superior

Keywords:

biology, fish, lake trout, monitoring, mortality,
sport fishing, rehabilitation, temperature,
length, biomass, regulations

Description:

OBJECTIVES:

To (1) estimate the hooking mortality rate of lake trout in the upper Great Lakes; and (2) determine the relationships, if any, between the observed mortality and depth, temperature differential, playing time, length, weight, sex, and gear used.

JUSTIFICATION:

Current lake trout population models indicate excessive mortality to be the cause for the failure of rehabilitation efforts. In order to reduce the total mortality rates on these fish, the Michigan Department of Natural Resources imposed a new set of regulations. Included in these regulations was a controversial closed season. The controversy stemmed from angler perceptions that lake trout which were caught and released in this closed season suffered high mortality rates.

Contact:

Andrew Loftus
Department of Fisheries and Wildlife
Michigan State University
East Lansing, Michigan 48824

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 92

LUXON, P.L.; HODSON, P.V.; CAREY, J.; LOCKHART, L.
Ontario - Canada Centre for Inland Waters, Burlington
Great Lakes Laboratory for Fisheries and
Aquatic Sciences

MIXED FUNCTION OXIDASE ACTIVITY OF GREAT LAKES FISH

Starting date: 1983

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of Fisheries and Oceans

Area: Lake Ontario; Lake Huron; Lake Superior

Keywords:

biology, fish, lake trout, bioassay, pollution, enzymes,
chemistry, organics, reproduction, PAH, contaminants,
monitoring

Description:

OBJECTIVES:

To (1) develop a reliable and practical assay for
mixed function oxidase activity in fish; (2) adapt
the assay for routine use in biological surveillance
of chemical effects in Great Lakes fish; and
(3) identify chemicals that induce MFO activity in
Great Lakes fish.

Contact:

P. L. Luxon

Great Lakes Laboratory for Fisheries and Aquatic Sciences

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Burlington, ON L7R 4A6

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 93

MAC, M.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

EFFECTS OF PARENTALLY TRANSFERRED CONTAMINANTS ON
SURVIVAL OF YOUNG LAKE TROUT

Starting date: 6/1984

Completion date: 5/1987

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Laboratory

Keywords:

biology, toxics, contaminants, fish, lake trout, eggs,
larval fish, mortality, fertilization, PCBs, survival,
organics, diet, reproduction, chemistry, forage base

Description:

Previous studies designed to examine the survival of lake trout eggs and fry of southeastern Lake Michigan origin have shown near total mortality of the fry. This abnormally high mortality occurs just prior to complete yolk absorption in fry of southeastern Lake Michigan but not in fry hatched from Lake Superior, Lake Huron, or hatchery egg sources. Chemical contaminants inherited from the spawning adults are a likely cause of this mortality. Eggs and sperm from adult hatchery fish fed Lake Michigan forage fish for one year will be taken to measure the influence of the inherited contaminants on fertilization, hatchability, and fry survival. All forage fish and experimentally contaminated eggs and fry will be analyzed for major contaminants and the results evaluated for correlations with measured fry mortality.

Contact:

Dr. Michael J. Mac
U.S. Fish and Wildlife Service
National Fisheries Center--Great Lakes
1451 Green Road
Ann Arbor, MI 48105
(313) 994-3331

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 94

MACCRIMMON, H.R.

Ontario - University of Guelph, Guelph
College of Biological Sciences

ECOLOGY OF LAKE TROUT AND OTHER SPECIES IN
PRE-CAMBRIAN SHIELD LAKES

Starting date: 1975
Completion date: Continuing
* means that date is uncertain
Project no.:
Sponsor: NRC, Tadenac Club Ltd.

Area: Tadenac Lake

Keywords:

biology, fish, lake trout, sport fishing, growth,
bioaccumulation, mercury, chemistry, inorganics,
diet, monitoring, fish strains

Description:

OBJECTIVES:

To (1) monitor the effects of annual plantings of hatchery-reared trout to enhance quality of trout fisheries; (2) monitor the growth, maturity, etc. in wild and released fish; and (3) quantify the bioaccumulation and biomagnification of mercury in native and released trout.

Contact:

Dr. Hugh R. MacCrimmon
Department of Zoology
University of Guelph
Guelph, ON N1G 2W1
(519) 824-4120

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 95

MACINS, V.; MOSINDY, T.

Ontario - Ministry of Natural Resources, Kenora
Lake of the Woods Fisheries Assessment Unit

LAKE TROUT POPULATION STUDIES

Starting date: mid 1960's

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake of the Woods; Clearwater Bay; Whitefish Bay

Keywords:

biology, fish, lake trout, monitoring, spawning,
chemistry, water quality, sport fishing, mortality,
reproduction, creel census, habitat, diet

Description:

OBJECTIVES:

To assess the long term effects of
exploitation, changes in water quality,
habitat, and associated fish community
on naturally reproducing lake trout
populations.

Contact:

Val Macins

Ontario Ministry of Natural Resources

Box 5080

Kenora, ON P9N 3X9

(807) 468-9841

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 96

MAINE DEPT. INLAND FISH. WILDL.

Maine - Department of Inland Fisheries and Wildlife, Greenville
Fish and Wildlife Hdqtrs.

MANAGEMENT PLAN FOR LAKE TROUT

Starting date: 10/01/1986

Completion date: 09/30/1991

* means that date is uncertain

Project no.:

Sponsor: Maine Department of Inland Fisheries and Wildlife

Area: Maine inland waters

Keywords:

biology, fish, lake trout, management, monitoring,
abundance, distribution, sport fishing

Description:

OBJECTIVES:

To (1) increase the distribution and abundance of lake trout in southern, western and east-central Maine, and maintain the present distribution and abundance of lake trout in all other regions; (2) provide for existing and anticipated use while maintaining the present fishing quality, on the average, in most waters; and (3) increase the opportunity to catch larger-than-average lake trout in selected waters.

Contact:

Paul Johnson
Maine Department of Inland Fish and Wildlife
Fish and Wildlife Hdqtrs.
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Greenville, ME 04441
(207) 289-3371

Ref. no. 97

MANNY, B.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

EFFECTS OF NUTRIENT LOADING ON LAKE TROUT SPAWNING
AND NURSERY HABITAT IN GREAT LAKES WATERS

Starting date: 10/1982

Completion date: 9/1988

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Lake Huron

Keywords:

biology, fish, lake trout, habitat, spawning, reefs,
water quality, eutrophication, detritus, loading,
sedimentation

Description:

This project is measuring and evaluating limnological conditions on historically important lake trout spawning grounds in Lake Huron and Lake Michigan to determine if eutrophication which has occurred since the native stocks were extinguished in the 1940's and 1950's has adversely affected the intrinsic potential of these spawning grounds to support reproduction by lake trout. Results to date indicate accelerated eutrophication and the settling out and decay of lake-produced detrital matter has rendered some historically productive lake spawning grounds unsuitable for use.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 98

MATSUMURA, F.

Michigan - Michigan State University, East Lansing
Pesticide Research Center

STUDIES ON THE TOXICOLOGICAL SIGNIFICANCE OF CHLORDANE
AND TOXAPHENE RESIDUES IN GREAT LAKES FISH

Starting date: 2/01/1986

Completion date: 1/31/1988

* means that date is uncertain

Project no.: R/TS-27

Sponsor: Michigan Sea Grant

Area: Lake Michigan; Lake Huron; Lake Erie; Lake Ontario;
Lake Superior

Keywords:

biology, chemistry, toxics, chlordane, toxaphene,
fish, salmonid, uptake, biotransformation, tumor,
biodegradability, lake trout, rainbow trout,
chinook salmon, coho salmon, organics, bioassay, model

Description:

OBJECTIVES:

To (1) analyze various tissues of 5 species of Great Lakes salmonids for chlordane and toxaphene residues with emphasis on component profiling; (2) assess the presence of toxic components relative to technical material by acute bioassays; (3) determine the specificity of mode of action on neuroreceptor site binding; (4) model ecosystem and in vitro biotransformation experiments designed to address relative uptake and biodegradability; and (5) assess of the toxicological relevance of the residue using tests for tumor promoter activity.

METHODOLOGY:

Methods will include a combination of analytical residue analysis of multiple species and multiple tissues coupled with promoting ability in an in vitro test system to assess the relative toxicologic potency of environmentally derived chlordane and toxaphene residues. Neuroreceptor studies will demonstrate the specificity of the response while in vitro metabolism and laboratory exposures will provide mechanisms for residue composition.

RATIONALE:

This research will provide a sound approach to the relative safety assessment of chlordane and toxaphene residues in Great Lakes fish.

ACCOMPLISHMENTS:

Separation and quantification of residues from

LAKE TROUT PROJECTS - 1985-CONTINUING

Paper submitted for 1986 Society of Environmental Toxicology and Chemistry annual meeting. Toxaphene manuscript to be submitted to Archives of Environmental Contamination and Toxicology.

BENEFITS:

The potential benefits will be to be able to estimate true levels of residues of toxaphene and chlordane in important fish species in the Great Lakes (e.g., lake trout, rainbow trout, coho and chinook salmon), and to understand how toxicologically serious these residues are to persons who consume these fish. Implications will be evident for lake biota as well.

Contact:

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(517) 353-9430

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 99

MCALLISTER, P.E.; OWENS, W.J.; BASCH, D.T; HERMAN, R.L.
West Virginia - National Fish Health Research Lab., Kearneysville

DETECTION OF TRANSMISSIBLE AGENTS IN IRON RIVER NFH LAKE TROUT

Starting date:

Completion date:

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Iron River (Wisconsin) National Fish Hatchery

Keywords:

biology, fish, lake trout, pathology, mortality,
aquaculture

Description:

OBJECTIVES:

To detect the transmissible agent or agents causing mortality in lake trout from Iron River NFH.

RATIONALE:

In the winter and spring of 1986, mortality began to occur in yearling lake trout at the Iron River NFH (WI). The mortality spread throughout the hatchery and involved the young of the year. Eventually greater than 99% of the young and a high percentage of the yearling fish died. Unusual mortality has since occurred in the brookstock. A task force was called together to investigate the mortality and to recommend procedures to mitigate further losses. Virological examinations detected no cytopathology in cell culture, and preliminary electron microscopic examination showed no virus-like structures. Transmission experiments at NFHRL and Iron River NFH showed that the cause of the mortality could be transmitted. The etiological agent needs to be detected and identified.

Contact:

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National Fish Health Research Laboratory
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(304) 725-8461

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 100

MCCOLLUM, W.

Ontario - Ministry of Natural Resources, Thunder Bay
Lake Superior Fisheries Unit

LAKE TROUT SPAWNING SHOALS IN WELCOME ISLAND AND HARE ISLAND AREA

Starting date: 08/1986

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Superior; Welcome Island; Hare Island

Keywords:

biology, fish, lake trout, monitoring, reefs, spawning,
mapping, substrate, chemistry, physical, eggs,
larval fish

Description:

OBJECTIVES:

To (1) estimate the spawning stock size using hydro-acoustic methods; (2) make quantitative estimates of hatching success using emergence traps; and (3) sample eggs after spawning to relate egg deposition to substrate.

Contact:

Wayne McCollum
Ontario Ministry of Natural Resources
Lake Superior Fisheries Assessment Unit
Thunder Bay District
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Thunder Bay, ON P7C 5G6
(807) 475-1635

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 101

MCCOMISH, T.

Indiana - Ball State University, Muncie
Biology Department

FOOD HABITS OF SALMONIDS IN INDIANA WATERS
OF LAKE MICHIGAN

Starting date: 4/01/1984

Completion date: 4/30/1987

* means that date is uncertain

Project no.: R/F-01

Sponsor: Illinois/Indiana Sea Grant Program

Area: Lake Michigan, Indiana waters

Keywords:

fish, trout, lake trout, diet, biology, salmonid,
chinook salmon, coho salmon, perch, smelt, alewife,
bloater chub, forage base

Description:

OBJECTIVES:

To (1) collect salmonid stomach contents and monitor food habits of major salmonids at several sites in Indiana waters of Lake Michigan between April and September, 1986; (2) compare food habits of major salmonids in 1986 with previous data collected in 1984-85 and in the 1970's; and (3) provide data to the coordinator of the Great Lakes Sea Grant Network Study on this subject.

METHODS:

Salmonids used for food habit evaluation will be caught mainly by sport fishermen in conjunction with fishing derbies at several locations in Indiana waters of Lake Michigan. Fish will be identified, measured, sexed, and weighted at dock side. Food habits will be evaluated in terms of species, date, size, and location of capture. Results of stomach analyses will be compared, as possible, with available forage food items.

RESULTS:

The major forage fish population in 1973 was dominated by alewives (45%), followed by yellow perch (30%) and rainbow smelt (25%). By 1984-86, the forage fish population shifted to dominance by perch (78-86%), followed by smelt (3-18%), bloater chub (2-11%), and alewife (1%). Diet studies conducted in 1970 for coho salmon, chinook salmon, and lake trout revealed alewives as the single dominant forage fish consumed (93-100%). By comparison, the 1984-86 evaluation revealed striking change due to forage base dynamics but continued strong salmonid preference for alewives which composed 33-80% of all diets. Continued salmonid

abundance is declining. This effect is somewhat mediated by increases in the bloater populations. It is clear that perch are not replacing alewives as a salmonid food in proportion to their current dominance of nearshore forage.

Contact:

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(317) 385-8845

Ref. no. 102

MEADE, J.W.

Pennsylvania - National Fish Research and Development
Laboratory (NFRDL), Wellsboro

PRE- AND POST-HATCH MORTALITY OF LAKE TROUT
(SALVELINUS NAMAYCUSH)

Starting date: *

Completion date: 1986

* means that date is uncertain

Project no.: 976-83.15

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, mortality, eggs,
temperature, larval fish, aquaculture

Description:

Eggs were reared under five temperature regimes;
incidence of blue-sac and fry mortality were correlated
with temperature. The study has resulted in installation
of temporary water chilling at Allegheny NFH and in plans
for a permanent water chilling system at Allegheny NFH.

Contact:

James W. Meade
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(717) 724-3322

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 103

MEADE, J.W.

Pennsylvania - National Fish Research and Development
Laboratory (NFRDL), Wellsboro

EFFECTS OF LOADING LEVELS, AS BIOMASS PER UNIT
WATER FLOW, FOR LAKE TROUT

Starting date: *

Completion date: 1986

* means that date is uncertain

Project no.: 976-83.14

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Ontario; Laboratory

Keywords:

biology, fish, lake trout, survival, water quality,
management, aquaculture

Description:

OBJECTIVES:

To determine the effects of loading level or raceway location on post-stocking survival of lake trout, 240,000 fish, marked with coded wire tags, were reared at NFRDL in four sections of three raceways. Each of the 12 raceway sections contained 20,000 fish evaluated for three months under cumulative loading conditions (i.e. progressively poorer water quality in successive raceway sections) before being stocked into Lake Ontario. Fish recovered from trawl samples, from 1986-1990, can be identified from nose tags as to loading level or raceway (water use) location.

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Ref. no. 104

MEADE, J.W.

Pennsylvania - National Fish Research and Development
Laboratory (NFRDL), Wellsboro

COMPARISON OF LOADING EFFECTS ON LAKE TROUT REARED ON
THREE SEPARATE WATER SOURCES (EACH WITH DIFFERENT HARDNESS)

Starting date: *

Completion date: 1987

* means that date is uncertain

Project no.: 976-83.17

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, bioassay, biochemistry,
ammonia, aquaculture, toxics, salt

Description:

One bioassay was completed and findings indicated that
salt content of rearing media greatly influences ammonia
toxicity.

Contact:

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U.S. Fish and Wildlife Service

National Fishery Research and Development Laboratory

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Ref. no. 105

MEADE, J.W.; SODERBERG, R.W.

Pennsylvania - National Fish Research and Development Laboratory,
Wellsboro

EFFECTS OF DENSITY ON PERFORMANCE OF HATCHERY REARED
ATLANTIC SALMON AND LAKE TROUT

Starting date:

Completion date: 1986

* means that date is uncertain

Project no.: 972-83.18

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, Atlantic salmon, growth,
survival, aquaculture

Description:

Density rearing studies were completed on both Atlantic
salmon and lake trout for the effects on growth, survival,
and fin condition.

Contact:

James W. Meade

U.S. Fish and Wildlife Service

National Fishery Research and Development Laboratory

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Ref. no. 106

METCALFE, C.D.

Ontario - Trent University, Peterborough
Environmental and Resource Studies Program

DISTRIBUTION OF PCB'S IN REMOTE LAKES OF ONTARIO

Starting date: 09/1986

Completion date: 09/1989

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Environment

Area: Muskoka County Lakes; Haliburton County lakes;
Renfrew County lakes; North of Great Lakes

Keywords:

biology, fish, lake trout, chemistry, organics,
PCBs, model, atmospheric, loading

Description:

Modeling of atmospheric inputs and distribution
of PCB's into remote lakes by sampling fish species,
including lake trout, and analyzing for PCB concen-
trations.

Contact:

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Department of Environmental Science
Trent University
Peterborough, ON K9J 7B8

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 107

MEYER, F.P.

Wisconsin - National Fishery Research Laboratory, La Crosse

CONTROL OF THE SEA LAMPREY AND ITS EFFECTS ON FISH STOCKS

Starting date:

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory; Lake Superior; Lake Huron; Lake Ontario;
Tributaries

Keywords:

biology, fish, lake trout, sea lamprey control,
sea lamprey wounding, mortality, tributaries,
survival, monitoring

Description:

OBJECTIVES:

To (1) examine the water chemistries of tributary streams to see if there may be clues or cues used by sea lampreys that affect their selection of spawning streams; (2) research ways to determine the distribution of ammocoetes in delta areas of tributary streams and attempt to devise new control techniques or formulations of such areas; (3) continue to monitor runs of adult sea lampreys into streams and attempt to relate numbers to wounding, scarring, or survival data developed from lake trout populations; (4) attempt to determine the physiological impact of lamprey attacks on lake trout, to assess the mortality rate from lamprey attacks, to determine whether survivors are still able to spawn after a lamprey attack, and factors used by lampreys in finding their prey; and (5) pursue a variety of techniques for possible neutering agents that might be used in a sterile male release program.

Contact:

Dr. Fred P. Meyer

U.S. Fish and Wildlife Service

National Fisheries Research Laboratory

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LaCrosse, WI 54601

(608) 783-6451

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 108

MITCHELL, C.; WALKER, S.H.; KELLY, T.K.

Michigan - Grand Traverse Band of Ottawa and Chippewa Indians,
Suttons Bay

COMMERCIAL FISHING ASSESSMENT

Starting date: 10/1985

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Inter-Tribal Fishery Management Program,
BIA contract

Area: Lake Michigan, northern basin; Grand Traverse Bay

Keywords:

biology, fish, lake trout, monitoring, commercial fishing,
whitefish, forage base, sport fishing, ice fishing, yellow perch,
bloater chub, burbot, management, biomass, populations,
growth, mortality, sea lamprey wounding

Description:

The commercial and subsistence fishing catch of all Grand Traverse Bay tribal fishers are monitored and sampled for stock assessment. Other activities include whitefish tagging, forage base studies, and sampling of sport anglers and ice fishers. Species sampled include lake whitefish, lake trout, yellow perch, bloater chubs and all forage species. Burbot sampling will begin this year. This program provides the tribe with biological information and management recommendations necessary to conserve the treaty fishery resource in Grand Traverse Bay and adjacent Lake Michigan.

Contact:

Christine Mitchell
Commercial Fishing Assessment
Biological Services Program
1102 Cass Ave.
Traverse City, MI 49684
(616) 941-1355

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 109

MUNRO, J.

Ontario - Dorset Research Center, Dorset
Limnology Section

SENSITIVITY OF NATIVE FISH TO ACUTE AND CHRONIC
PH DEPRESSIONS IN STREAMS AND LAKES

Starting date: 04/01/1981

Completion date: 03/31/1986

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of the Environment

Area: Lake Ontario, tributaries; Lake Huron, tributaries;
Lake Superior, tributaries; Lake Erie, tributaries

Keywords:

biology, fish, lake trout, brook trout, rainbow trout,
redbelly dace, brook stickleback, largemouth bass,
pumpkinseed, brown bullhead, pH, chemistry, inorganics,
acid rain, aluminum, survival, water quality, fish strains,
monitoring, toxics, contaminants

Description:

OBJECTIVES:

To determine (1) if there are spatial and temporal patterns in survivorship of fish during spring runoff that can be related to water chemistry; and (2) the relative sensitivity of different species and different stocks within species in field situations.

METHODOLOGY:

An in-situ assessment of early life stage survival during short- and long-term exposures of eight fish species (lake trout, brook trout, rainbow trout, northern redbelly dace, brook stickleback, largemouth bass, pumpkinseed and brown bullhead) to varying pH (4.1 to 6.5) and aluminum concentrations (<5 to 250 micrograms/l) was conducted.

RATIONALE:

Since these studies are related to the effects of acid rain on the environment, they may be of marginal interest to Great Lakes lake trout management efforts, given the non-sensitivity of the Great Lakes to acid rain. However, since near shore spawners may be impacted by snowmelt and associated low pH, high aluminum concentrations and low calcium, the results may be of interest.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 110

NIMII, A.J.

Ontario - Canada Centre for Inland Waters, Burlington
Great Lakes Laboratory for Fisheries and Aquatic Sciences

ENVIRONMENTAL KINETICS OF PCBS, DPES, FURANS, AND
DIOXINS IN FISH

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: Canada Department of Fisheries and Oceans

Area: Lake Ontario

Keywords:

biology, fish, lake trout, chemistry, organics, PCBs,
DPEs, furans, dioxin, bioaccumulation

Description:

Polychlorinated biphenyls, chlorinated diphenyl ethers, and chlorinated furans and dioxins represent a group of compounds that are similar in chemical structure except for the bonding between phenyl rings. There is a good information base on the environmental distribution and probable behavior of PCBs in aquatic ecosystems, and some information on the distribution of furans and dioxins, but relatively little is known about the environmental fate of DPEs even though they have been found in Great Lakes fishes. Laboratory studies have indicated considerable differences in behavior among these chemical groups in fish, although physical properties such as octanol-water partition coefficients would suggest their behavior could be similar. About 70-85% of PCBs ingested by trout are absorbed, and most isomers are retained once acquired. In contrast, only about 10-30% of furans and dioxins ingested are absorbed, with half-lives of 5-50 days. DPEs tend to show an intermediate response where 20-60% of the compounds ingested are absorbed, with half-lives in the 50-150+ days range. These results are discussed in relation to the PCBs, DPEs, furans, and dioxins levels monitored in the Lake Ontario ecosystem.

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Ref. no. 111

NOAKES, D.L.G.; NUNAN, C.P.

Ontario - University of Guelph, Guelph
Department of Zoology
Group for the Advancement of Fish Studies

EFFECTS OF REARING ON TROUT BEHAVIOUR

Starting date: *

Completion date: *

* means that date is uncertain

Project no.:

Sponsor: Ontario Renewable Resources Research Grant Program

Area: Laboratory

Keywords:

biology, fish, lake trout, brook trout, splake,
rainbow trout, artificial reefs, spawning, light,
movement, currents, physical, larval fish, behavior

Description:

This study investigated the behavioral responses of embryonic lake trout, brook trout, splake, and rainbow trout to manipulations of environmental variables within artificial spawning reefs. Critical light levels necessary to produce avoidance behavior in photonegative free embryos of lake and brook trout and splake were determined, and compared to previously studied movement patterns within artificial substrates. Light sensitivity of embryos was inversely related to their depth of penetration into artificial substrates. Also, brook trout maintained in vertical substrate tanks showed similar movement patterns whether in normal photoperiod or total darkness. Preliminary investigations of the influence of water flow on rainbow trout embryos indicated that direction of current flow had little effect on the pattern of movements within the substrate.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 112

O'CONNOR, D.; FOSTER, N.; HENRY, M.
Michigan - National Fisheries Center--Great Lakes, Ann Arbor

REPRODUCTIVE AND DEVELOPMENT REQUIREMENTS OF DIFFERENT
LAKE TROUT STRAINS

Starting date: 10/1984
Completion date: 09/1987
* means that date is uncertain
Project no.: 973.7509
Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, genetics, reproduction,
growth, physiology, development, fish strains, otoliths,
life history, origin

Description:

The reproductive biology and early life history of different lake trout strains planted in the Great Lakes suggests the existence of genetically-based differences in the timing of ripening and spawning and in the timing of hatching and swim-up. Such differences influence the incubation period of eggs in the environment, availability of food for newly hatched fry, and ultimately the survival and reproductive potential of a given strain depending on where they are planted. This study compares adult lake trout of 3 strains with respect to stage and timing of reproductive maturation as indicated by plasma hormones, gamete development, ripening, and viability of eggs and sperm. Fertilized eggs from these strains will be incubated at constant temperature to compare time of eyeup, hatching, swim-up, and growth rates of fry. Otoliths of these will be evaluated to measure growth or early life history events to determine strain of origin.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 113

OSTERGAARD, D.E.

Pennsylvania - Allegheny National Fish Hatchery, Warren

EFFECTS OF WATER TEMPERATURE ON SURVIVAL OF EGGS AND
FRY OF LAKE TROUT (SALVELINUS NAMAYCUSH)

Starting date: 1984

Completion date: 1986

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory; Lake Ontario; Stony Island

Keywords:

biology, fish, lake trout, eggs, temperature,
reproduction, survival, aquaculture, fish strains

Description:

Lake trout eggs, both wild (Lake Ontario) and hatchery (Seneca strain), were incubated during 1984-85 and 1985-86 in chilled water temperatures from 41.5 F for November, to 38.7 F for January and back up to 45.9 F for February when chillers were gradually turned down. Ambient water temperatures varied from 51 F in November to 47 F in February. A total of 208,560 of 388,600 eggs incubated in chilled water survived to a size of 2,500/lb while a total of 86,930 of 492,600 eggs incubated in ambient water survived to a size of 2,500/lb. Survival to 2,500/lb was 53.7% for eggs incubated in chilled water and 17.7% for eggs incubated in ambient water.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 114

PECK, J.W.

Michigan - Department of Natural Resources, Marquette
Marquette Fisheries Station

DYNAMICS OF UNEXPLOITED LAKE WHITEFISH STOCKS IN MICHIGAN
WATERS OF WESTERN LAKE SUPERIOR

Starting date: 1983

Completion date: 1988

* means that date is uncertain

Project no.: F-53-R, Study 423

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior west of Keweenaw Peninsula

Keywords:

biology, fish, lake trout, whitefish, commercial fishing,
monitoring, mortality

Description:

OBJECTIVES:

To determine the catch and mortality of non-target
species in a commercial whitefish trap-net fishery.

Contact:

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(906) 249-1611

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 115

PECK, J.W.

Michigan - Michigan Department of Natural Resources, Marquette
Marquette Fisheries Research Station

ASSESSMENT OF LAKE TROUT STOCKS IN MICHIGAN WATERS OF
LAKE SUPERIOR

Starting date: 1983

Completion date: 1988

* means that date is uncertain

Project no.: F-53-R

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior, Michigan waters

Keywords:

biology, fish, lake trout, monitoring, abundance, origin,
length, age, sea lamprey wounding, rehabilitation, reefs,
sea lamprey control, populations, reproduction, spawning,
fish strains, aquaculture

Description:

OBJECTIVES:

To (1) determine annually the relative abundance, origin, length, age, sex, maturity, and sea lamprey wounding rates for lake trout stocks in Michigan waters of Lake Superior necessary to assess lake trout rehabilitation and sea lamprey control; (2) measure similar parameters for spawner populations on selected spawning reefs; and (3) determine relative contribution to the fishery and spawning populations of hatchery fish from special strains, cultured and/or planted under various experimental strategies.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 116

PECK, J.W.

Michigan - Department of Natural Resources, Marquette
Marquette Fisheries Station

EVALUATION OF JUVENILE SALMONID PLANTS IN MICHIGAN WATERS
OF LAKE SUPERIOR

Starting date: 1984

Completion date: 1990

* means that date is uncertain

Project no.: F-53-R, Study 419

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior at Marquette, Michigan

Keywords:

biology, fish, lake trout, sport fishing, yield,
monitoring, salmonid, fish strains

Description:

OBJECTIVES:

To determine return to the angler (catch and
catch-per-unit effort) of hatchery-reared and
wild trout and salmon at major sport fishing
areas in Michigan waters of Lake Superior.

Contact:

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(906) 249-1611

Ref. no. 117

PELLEGRINI, M.

Ontario - Ministry of Natural Resources, Wawa
Wawa District

SPORT FISHING CREEL CENSUS

Starting date: 1986

Completion date: 1986

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Superior; Michipicoten Bay

Keywords:

biology, fish, lake trout, creel census, sport fishing,
chinook salmon, coho salmon, pink salmon, rainbow trout,
brown trout, management, monitoring, biomass, origin,
sea lamprey wounding

Description:

In 1986, a sport fish creel census was conducted on Michipicoten Bay. Of the 195 lake trout sampled, 128 or 65.6% were of native origin. This is a significant change from previous surveys where very few native lake trout were caught. The creel census includes assessment for catch-per-unit-effort, harvest, weight, origin, and sea lamprey wounding.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 118

PETERSON, R.

Wisconsin - University of Wisconsin, Madison
School of Pharmacy

TOXIC HALOGENATED AROMATIC HYDROCARBONS IN LAKE TROUT
GAMETES AS A FACTOR OF FRY SURVIVAL

Starting date: 9/01/1987

Completion date: 8/31/1992

* means that date is uncertain

Project no.: R/MW-40

Sponsor: Wisconsin Sea Grant Institute

Area: Lake Michigan; Laboratory

Keywords:

chemistry, dioxin, PCBs, organics, toxics, contaminants,
biology, fish, eggs, reproduction, lake trout, larval fish,
nutrition, histopathology, synergism, furans, naphthalene,
TCDD

Description:

OBJECTIVES:

To determine if: (1) lake trout eggs from Lake Michigan contain toxic halogenated aromatic hydrocarbons; (2) the fry develop a TCDD-like wasting syndrome before death; (3) the cause of wasting is impaired adsorption of yolk sac nutrients, hepatotoxicity, or reduced food intake; (4) TCDD or PCB isomers that are MC-, PB- or mixed-type inducers cause similar toxicity; and (5) combinations of TCDD and PCB isomers act additively to cause fry toxicity.

METHODOLOGY:

Experimental lake trout hatchery, Biotron facility for TCDD research on aquatic species, body composition methodology, cell culture equipment, HPLC methodology for TCDD metabolites, methodology for enzyme assays (AHH, EROD).

RATIONALE:

Isomers of halogenated aromatic hydrocarbons (biphenyls, dibenzo-p-dioxins, dibenzofurans, naphthalenes) that act by the same mechanism as TCDD but have widely varying potencies may be present in Lake Michigan lake trout gametes in high enough amounts and sufficiently potent in combination to produce a TCDD-like wasting syndrome in fry that ultimately causes death.

ACCOMPLISHMENTS:

(1) Developed facility for TCDD research on fish at the U.W. Biotron; (2) showed for the first time that fish are able to metabolize TCDD; (3) completed bioaccumulation, tissue distribution and depuration

LAKE TROUT PROJECTS - 1985-CONTINUING

(4) completed acute toxicity study of TCDD in juvenile perch and trout; (5) completed study on virus disease resistance and immune responses in rainbow trout exposed to TCDD.

BENEFITS:

(1) If this study determines that lake trout reproductive failure is caused by toxic halogenated aromatic hydrocarbons (THAHs) in gametes, it would strongly influence lake trout stocking policies for Lake Michigan; (2) If THAHs act additively to cause fry mortality, regulatory agencies will need to know the total egg burden of THAHs to predict the risk to lake trout reproduction. Inexpensive hepatoma induction assays could screen eggs for total THAH contamination so that expensive isomer-specific GC-MS analyses are only done on "induction positive" samples.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 119

PEYTON, R.B.

Michigan - Michigan State University, East Lansing
Fisheries and Wildlife Department

AN ANALYSIS OF GREAT LAKES SALMONID ANGLER PREFERENCES
AND EXPECTANCIES FOR FUTURE FISHERIES MANAGEMENT PROGRAMS
IN LAKE MICHIGAN

Starting date: 7/01/1988

Completion date: 6/30/1989

* means that date is uncertain

Project no.: R/RP-09

Sponsor: Michigan Sea Grant Program

Area: Lake Michigan

Keywords:

recreation, sport fishing, sociology, management,
salmonid, fish, lake trout, angler survey

Description:

OBJECTIVES:

To (1) Investigate recreational stages and development processes in Great Lakes salmonid anglers; (2) determine the awareness level, values and beliefs held by Great Lakes anglers regarding Great lakes fishery issues; (3) determine representativeness of user input to management decisions; and (4) investigate factors which influence recruitment and drop rates among Great Lakes salmonid anglers.

METHODOLOGY:

Anglers licensed by the Michigan Department of Natural Resources will be surveyed by mail questionnaire. Non-respondents will be sampled and sent abbreviated questionnaires. Field surveys (site intercepts) will be used to further develop questionnaire findings.

RATIONALE:

Both the biology of Great Lakes fish communities and sociology of Great Lakes anglers appear to be in a transition state and neither is well understood. Conflicts in basic philosophy exist between Great Lakes policy setters. Public input to the management process has often been restricted to special interest groups. Great Lakes fishery management could be more effective and face less disruption if representative public input and an understanding of the social/psychological dynamics of anglers were gained. Both the well being of the Great Lakes resource and socio-economic benefits can be enhanced.

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(517) 355-4477

Ref. no. 120

PHILIPP, D.P.

Illinois - Illinois Natural History Survey, Champaign
Aquatic Biology Section

THE ESTABLISHMENT OF A STATE FISHERIES GENETICS PROGRAM
IN ILLINOIS

Starting date: 10/01/1983

Completion date: 06/30/1986

* means that date is uncertain

Project no.: F-45-R

Sponsor: Illinois Department of Conservation

Area: Lake Michigan; Jake Wolfe Hatchery; Illinois lakes

Keywords:

biology, fish, lake trout, genetics, biochemistry,
populations, sport fishing, fish strains

Description:

OBJECTIVES:

To establish a program that would be a coordinated effort of Department of Conservation (DOC) field biologists, DOC propagation biologists and Natural History Survey fisheries geneticists to: (1) assess the strengths and limitations of specific stocks of largemouth bass in Illinois for propagation and stocking programs; (2) assess the genetic impact of striped bass and F1 hybrid striped x white bass hybrids on native white bass populations; and (3) define the genetic composition of all of the species of sportfishes, including lake trout, produced at or procured by the DOC hatchery facilities for comparison with the existing populations in the state.

Contact:

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(217) 333-6897

Ref. no. 121

PHILIPP, D.P.; WHITT, G.S.

Illinois - Illinois Natural History Survey, Champaign
Aquatic Biology Section

REPRODUCTIVE SUCCESS OF LAKE TROUT ON JULIAN'S REEF,
LAKE MICHIGAN

Starting date: 06/1986

Completion date: 05/1988

* means that date is uncertain

Project no.:

Sponsor: Illinois Department of Conservation

Area: Lake Michigan; Julian's Reef; Illinois waters

Keywords:

biology, fish, lake trout, genetics, fish strains,
biochemistry

Description:

Identify strains of lake trout successfully spawning
on Julian's Reef through the use of isozyme and mtDNA
polymorphisms.

Contact:

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(217) 333-6897

Ref. no. 122

PHILLIPS, R.B.

Wisconsin - University of Wisconsin, Milwaukee
Department of Biological Sciences
Center for Great Lakes Studies

CYTOGENETIC ASSAYS OF WALLEYE AND LAKE TROUT EMBRYOS
REARED IN AQUARIA WITH FLY ASH BLOCKS

Starting date: 04/1985

Completion date: 02/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Electric Power Co.

Area: Laboratory

Keywords:

biology, fish, lake trout, genetics, larval fish, walleye,
development, physiology, bioassay, fly ash, aquaculture

Description:

Contact:

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University of Wisconsin
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(414) 963-4909

Ref. no. 123

PHILLIPS, R.B.

Wisconsin - University of Wisconsin, Milwaukee
Department of Biological Studies
Center for Great Lakes Studies

EVOLUTION OF RIBOSOMAL DNA IN LAKE TROUT, BROOK TROUT
AND THEIR HYBRIDS

Starting date: 07/1986

Completion date: 06/1989

* means that date is uncertain

Project no.:

Sponsor: National Science Foundation

Area: Laboratory

Keywords:

biology, fish, lake trout, brook trout, genetics

Description:

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Ref. no. 124

PHILLIPS, R.B.

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Department of Biological Sciences
Center for Great Lakes Studies

APPLICATION OF CHROMOSOME BANDING TECHNIQUES TO STOCK
IDENTIFICATION IN LAKE TROUT

Starting date: 09/1983

Completion date: 12/1985

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fishery Commission

Area: Laboratory

Keywords:

biology, fish, lake trout, genetics, fish strains

Description:

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Ref. no. 125

PHILLIPS, R.B.; IHSSSEN, P.E.

Wisconsin - University of Wisconsin, Milwaukee
Department of Biological Sciences
Center for Great Lakes Studies;
Ontario - Ministry of Natural Resources, Maple
Fisheries Research Section

APPLICATION OF GENETIC TECHNIQUES TO STOCK IDENTIFICATION
IN LAKE TROUT

Starting date: 03/1986

Completion date: 03/1987

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fish. Comm., Ontario Ministry of
Natural Resources

Area: Laboratory; Lake Superior; Seneca Lake; Marquette
Hatchery; Lans Lake and Jenny Lake, Wyoming

Keywords:

biology, fish, lake trout, genetics, origin

Description:

OBJECTIVES:

To determine whether variation in the nuclear
organizer, CM3, and C-banding in lake trout
can be used for marking and differentiation
lake stock strains.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 126

RAKOCZY, G.

Michigan - Michigan Department of Natural Resources, Charlevoix
Charlevoix Fisheries Station

MEASUREMENT OF SPORT FISHING HARVEST IN LAKES MICHIGAN
HURON, AND SUPERIOR

Starting date: 05/01/1986

Completion date: 04/30/1988

* means that date is uncertain

Project no.: F-53-R, Study 427

Sponsor: U.S. Fish and Wildlife Service, Dingell-Johnson
Project

Area: Lake Huron, U.S. waters

Keywords:

biology, fish, lake trout, sport fishing,
monitoring

Description:

OBJECTIVES:

To obtain a continuous record of sport catch,
catch rates, and catch composition in the
Great Lakes and anadromous fisheries.

Contact:

G. Rakoczy
Michigan Department of Natural Resources
Charlevoix Fisheries Station
Charlevoix, MI

Ref. no. 127

RAPPE, C.

Sweden - University of Umea, Umea
Dept. of Organic Chemistry

ISOMER SPECIFIC ANALYSIS OF GREAT LAKES FISH
FOR DIOXINS AND FURANS

Starting date: 06/1984

Completion date: 12/1986

* means that date is uncertain

Project no.:

Sponsor: U.S. EPA - Great Lakes National Program Office

Area: Lake Michigan; Lake Superior; Lake Huron; Lake Erie;
Lake Ontario; Lake St. Clair

Keywords:

chemistry, biology, fish, lake trout, organics,
toxics, halogenated hydrocarbons, contaminants,
database, dioxin, furans

Description:

The purpose of this project is to develop a statistically interpretable data base on polychlorinated dibenzo dioxins and furans in the Great Lakes and Midwest fish. Isomer specific analysis of Cl(4)-Cl(8) PCDDs and PCDFs will be performed on 5 samples (5 fish composites) of lake trout each from 10 Great Lakes sites (50 samples), 15 Region V samples (location and species to be decided) and 5 samples from the Netherlands. Project will produce data and reports comparing Great Lakes and Region V with these contaminated European lakes.

Contact:

Dr. Christopher Rappe
University of Umea
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Umea, Sweden

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 128

REGIER, H.A.; CHRISTIE, G.C.; MEISNER, J.D.;
HOLMES, J.A.

Ontario - University of Toronto, Toronto
Department of Zoology

EFFECTS OF CLIMATE CHANGES DUE TO THE GREENHOUSE EFFECT
ON FISH OF THE GREAT LAKES BASIN

Starting date: 1983

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Natural Sciences and Engineering Research Council
of Canada

Area: Lake Ontario; Lake Huron; Lake Erie; Lake Superior

Keywords:

biology, fish, lake trout, temperature, habitat,
commercial fishing

Description:

A measurement of optimal thermal habitat and their
relationship to yields for commercial fish species.

Contact:

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Ref. no. 129

RODGERS, P.
Michigan - Limno-Tech, Inc., Ann Arbor

GREAT LAKES TOXIC MODELING

Starting date: 04/1986

Completion date: 04/1987

* means that date is uncertain

Project no.:

Sponsor: U.S. Environmental Protection Agency, Region V,
GLNPO

Area: Lake Ontario

Keywords:

chemistry, organics, PCBs, biology, fish, lake trout, model,
sediment, toxics, contaminants, management, water quality,

Description:

OBJECTIVES:

To (1) produce a toxics model for Great Lakes management;
(2) simulate toxic fate in water, sediment, and fish;
and (3) focus on assessing management alternatives.

Contact:

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15 Research Dr.
Ann Arbor, MI 48103
(313) 995-3130

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 130

RYBICKI, R.W.

Michigan - Department of Natural Resources, Charlevoix
Charlevoix Great Lakes Fisheries Station

ASSESSMENT OF LAKE TROUT POPULATIONS IN THE
TREATY AREA OF LAKE MICHIGAN

Starting date: 1984

Completion date: 1989

* means that date is uncertain

Project no.: F-35-R, Study 432

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Michigan near Pentwater; near Frankfort, Michigan;
Grand Traverse Bay; Little Traverse Bay; Good Harbor Bay

Keywords:

biology, fish, lake trout, mortality, commercial fishing,
monitoring, sport fishing, survival, forage base

Description:

OBJECTIVES:

To calculate survival rates, standing stock,
and total allowable yield for lake trout in
treaty area.

JUSTIFICATION:

Significant natural recruitment of lake trout
has not materialized, despite annual plantings
since 1965. A major part of the problem may be
excessive harvest by both sport and commercial
interests. The Lake Michigan Lake Trout Technical
Committee has recommended that the annual survival
rate be not less than 60%. This means that survival
estimates must be fairly precise so that harvest
quotas can be set accordingly.

Contact:

R. W. Rybicki
Michigan Department of Natural Resources
Charlevoix Great Lakes Fisheries Station
Charlevoix, MI

Ref. no. 131

RYBICKI, R.W.

Michigan - Department of Natural Resources, Charlevoix
Charlevoix Great Lakes Fisheries Station

EVALUATION OF LAKE TROUT PLANTED EXPERIMENTALLY
IN THE REFUGE AREA OF NORTHERN LAKE MICHIGAN

Starting date: 1986

Completion date: 1996

* means that date is uncertain

Project no.:

Sponsor: Michigan Department of Natural Resources

Area: Lake Michigan; Beaver Island area

Keywords:

biology, fish, lake trout, survival, growth,
reproduction, monitoring, reefs, fish strains,
rehabilitation

Description:

OBJECTIVES:

To evaluate the survival, growth, and reproduction
of lake trout stocked experimentally in a refuge area
of northern Lake Michigan.

JUSTIFICATION:

Some 750,000 yearling lake trout, equally divided
between three strains, are to be stocked annually
in the northern refuge on several reefs historically
known to have been lake trout grounds; the multi-
strain planting is to begin in 1986 and continue for
at least 10 consecutive years.

Contact:

R. W. Rybicki
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Charlevoix Great Lakes Fisheries Station
Charlevoix, MI

Ref. no. 132

SAARI, M.J.

Ontario - Nipissing University College, North Bay
Department of Psychology

NEURAL AND BEHAVIORAL PLASTICITY IN LAKE TROUT

Starting date: 1985

Completion date: 1985

* means that date is uncertain

Project no.:

Sponsor: Nipissing University College

Area: Laboratory

Keywords:

biology, fish, lake trout, aquaculture, growth, behavior,
physiology

Description:

Two replicates of 5-month-old Lake Manitoba lake trout from the Provincial Fish Hatchery, North Bay, Ontario were reared in covered or uncovered rearing troughs and fed by hand or from a "demand" feeder from June 25 to September 14 under hatchery rearing condition. The covered, hand-fed fish were significantly heavier and more active when startled. Hand-fed fish were generally lighter in color, heavier in weight, and dominated the bottom of a test cylinder. Fish in the covered rearing troughs had increased startle reactions to a visual stimulus, increased body and whole brain weights, and reduced brain serotonin levels. The poorest food conversion ratios were found in the uncovered, hand-fed group. The results reveal both neural and behavioral sensitivity to hatchery rearing conditions in lake trout, and suggest improvements of fish hatchery rearing methods.

Contact:

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North Bay, ON P1B 8L7

Ref. no. 133

SAVITZ, J.; JANSSEN, J.
Illinois - Loyola University, Chicago
Biology Department

PREY HANDLING TIMES FOR LAKE MICHIGAN SALMONIDS

Starting date: 4/01/1984
Completion date: 12/31/1984
* means that date is uncertain
Project no.: R/F-02
Sponsor: Illinois/Indiana Sea Grant

Area: Lake Michigan, Illinois waters

Keywords:

fish, predation, biology, salmonid, diet, forage base,
rainbow trout, coho salmon, chinook salmon, lake trout,
alewife, smelt, bloater chub, yellow perch

Description:

OBJECTIVES:

To determine (1) handling time curves for salmonid predators (coho salmon, chinook salmon, lake trout, and rainbow trout) for certain Lake Michigan forage fishes (alewife, smelt, bloater, and yellow perch); and (2) what size of prey are relatively immune to salmonid predation.

METHODS:

The salmonids are available at the Shedd Aquarium. Prey species will be obtained by gill netting off of Loyola University of Chicago. A variety of prey and predator sizes will be used. Handling time is the time from when the prey is grasped until the last swallowing is detected.

BENEFITS:

To be able to predict what sizes of particular prey species are relatively immune to salmonid predation and enhance the interpretation of stomach analysis data being done around Lakes.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 134

SCHNEIDER, C.P.

New York - Department of Environmental Conservation, Cape Vincent
Lake Ontario Fisheries Unit

LAKE TROUT REHABILITATION IN LAKE ONTARIO

Starting date: 1975

Completion date: 2000

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fishery Commission, New York Dept. of
Env. Cons.

Area: Lake Ontario; Stony Island; Charity Shoal;
Allan Otty Shoal

Keywords:

biology, fish, lake trout, rehabilitation, larval fish,
survival, reefs, water quality, reproduction, mortality,
sport fishing, commercial fishing, sea lamprey control,
life history, development, habitat, mapping

Description:

OBJECTIVES:

By the year 2000, develop a Lake Ontario lake
trout stock consisting of 0.5 to 1.0 million
adult fish with females that average 7.5 years
of age and produce 100,000 yearling annually.

RECOMMENDATIONS:

(1) Minimize lake trout mortality by restricting
sport fishing in U.S. waters, continuing the
commercial buyout of gill net fisheries in
Canadian waters and by improving sea lamprey
control lakewide. (2) Focus more attention on the
early life history stages of lake trout now being
produced in Lake Ontario. Accelerate investigations
of habitat quality in spawning and nursery areas.
A first step should include detailed mapping of all
major, historic spawning shoals in the Eastern Basin.

Contact:

Cliff Schneider
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(315) 654-2147

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 135

SCHORFHAAR, R.

Michigan - Michigan Department of Natural Resources, Marquette
Marquette Fisheries Station

ASSESSMENT OF ISLE ROYALE LAKE TROUT STOCKS

Starting date: 1983

Completion date: 1987

* means that date is uncertain

Project no.: F-53-R, Study 425

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior; near Isle Royale

Keywords:

biology, fish, lake trout, monitoring, management,
abundance, mortality, sea lamprey wounding,
rehabilitation, populations, origin

Description:

OBJECTIVES:

To annually determine relative abundance, origin, length, and age composition, sex and maturity, sea lamprey wounding rates, and total mortality rates for lake trout stocks in Isle Royale waters of Lake Superior necessary to assess lake trout rehabilitation and sea lamprey control and to compare population dynamics of the Isle Royale lake trout stocks with those of various inshore stocks.

Contact:

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Marquette Fisheries Station
Research and Assessment Unit
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(906) 249-1611

Ref. no. 136

SCHORFHAAR, R.

Michigan - Michigan Department of Natural Resources, Marquette
Marquette Fisheries Station

ASSESSMENT OF SISCOWET AND HUMPER POPULATIONS
OF LAKE TROUT IN LAKE SUPERIOR

Starting date: 1983

Completion date: 1988

* means that date is uncertain

Project no.: F-53-R, Study 426

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior, Michigan waters

Keywords:

biology, fish, lake trout, populations, abundance,
monitoring, commercial fishing, economics

Description:

OBJECTIVES:

To determine (1) relative abundance of siscowet and humper lake trout in several areas of Michigan waters of Lake Superior from commercial catch; (2) catch of non-target species especially lean lake trout; and (3) if an adequate market exists or can be developed to accommodate 1000,000 - 2000,000 pounds of siscowet and humper lake trout.

JUSTIFICATION:

Interest has been expressed by the commercial fishermen in diversifying the fisheries by adding siscowet and humper lake trout to their catch. This would help satisfy a market desire for smoked lake trout and, to a lesser extent (because of their high fat content), a fresh lake trout market. Except for the incidental catch in chub nets, this resource is presently not being utilized. Lake Superior commercial fishermen and we, feel that based upon the numbers of incidentally caught siscowet lake trout in nets fished for chubs, siscowet stocks have increased in abundance in recent years. We are concerned that competition with and predation on other stocks of fish such as chub, herring, and lean lake trout may be severe.

Contact:

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Marquette MT 59855

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 137

SCHORFHAAR, R.

Michigan - Department of Natural Resources, Marquette
Marquette Fisheries Station

NON-TARGET MORTALITY OF SALMONIDS IN TRAP-NET FISHERIES
FOR WHITEFISH IN MICHIGAN WATERS OF LAKE SUPERIOR

Starting date: 1985

Completion date: 1990

* means that date is uncertain

Project no.: F-53-R, Study 443

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior between Keweenaw Point and AuSable Point

Keywords:

biology, fish, lake trout, salmonid, whitefish, mortality,
commercial fishing, monitoring

Description:

OBJECTIVES:

To specify the rate of non-target mortality of
salmonids in trap nets fished for whitefish in
Michigan waters of Lake Superior.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 138

SEELYE, J.G.; ESHENRODER, R.

Michigan - U.S. Fish and Wildlife Service, Millersburg
Hammond Bay Biological Station;

Michigan - Great Lakes Fishery Commission, Ann Arbor

STUDIES OF HOMING AND REPRODUCTIVE BIOLOGY OF LAKE TROUT--
OTOLITH MARKING EXPERIMENTS

Starting date: 01/1986

Completion date: 05/1989

* means that date is uncertain

Project no.:

Sponsor: Great Lakes Fishery Commission

Area: Lake Huron; Six Fathom Banks

Keywords:

biology, fish, lake trout, reefs, spawning, imprinting,
larval fish, otoliths, reproduction, homing

Description:

OBJECTIVES:

To examine the potential for imprinting the
lake trout sac fry to a historical spawning
reef in Lake Huron.

Contact:

Dr. James Seelye

Station Chief

Hammond Bay Biological Station

U.S. Fish and Wildlife Service

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 139

SELGEBY, J.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

APPRAISAL OF LAKE TROUT RESTORATION EFFORTS IN LAKE SUPERIOR

Starting date: 07/1972

Completion date: Continuing

* means that date is uncertain

Project no.: 980.2001

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Superior

Keywords:

biology, fish, lake trout, rehabilitation,
management, mortality, fish strains, populations

Description:

OBJECTIVES:

To determine (1) if and at what rate self-sustaining stocks can be reestablished; (2) alternate stocking methods needed to adequately increase natural reproduction; and (3) levels of exploitation that can be sustained without jeopardizing the ultimate objectives of stock rehabilitation.

PROCEDURES:

To (1) maintain a current summary of basic biological and fishery data on catch and effort in trout populations; and (2) synthesize these data for a) measures of total trout mortality, losses due to fishing, predation, and other causes, and b) estimates of lake trout standing stock and its sustainable yield.

Contact:

J. Selgeby

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1451 Green Road

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Ref. no. 140

SELGEBY, J.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

SURVEILLANCE AND STATUS OF FISH POPULATIONS IN LAKE SUPERIOR

Starting date: 07/1970

Completion date: Continuing

* means that date is uncertain

Project no.: 980.2002

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Superior

Keywords:

biology, fish, lake trout, monitoring, abundance, distribution, growth, mortality, diet, whitefish, forage base, management, rehabilitation, sea lamprey wounding, sport fishing, bloater chub

Description:

OBJECTIVES:

To (1) determine the abundance, distribution, size/age composition, growth, mortality, maturity, diet, etc.; (2) determine the degree of success of sea lamprey control and lake trout rehabilitation programs; (3) evaluate the impact of fisheries and effectiveness of present regulations; (4) develop new interagency management plans; (5) predict Total Allowable Catches for chub, lake trout, and whitefish, especially in treaty-ceded waters; and (6) determine the capacity of prey-fish stocks to sustain present or increased levels of salmonid predation.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 141

SHUTER, B.; MATUSZEK, J.

Ontario - Ministry of Natural Resources, Maple
Fisheries Research Section

POPULATION DYNAMICS OF LAKE OPEONGO LAKE TROUT

Starting date: 01/1985

Completion date: 07/1988

* means that date is uncertain

Project no.:

Sponsor: Ontario Ministry of Natural Resources

Area: Lake Opeongo

Keywords:

biology, fish, lake trout, growth, reproduction,
recruitment, model

Description:

OBJECTIVES:

To (1) describe long term variability in
recruitment and individual growth; and
(2) identify abiotic and biotic correlates
of such variation.

Contact:

Dr. Brian J. Shuter
Ontario Ministry of Natural Resources
Fisheries Research Section
Box 50
Maple, ON LOJ 1E0
(416) 832-2761

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 142

SIESENNOP, G.

Minnesota - Department of Natural Resources, St. Paul

EVALUATION OF VARIOUS STRAINS OF LAKE TROUT IN INLAND
LAKES IN NORTHEASTERN MINNESOTA

Starting date: 1981

Completion date: 1990

* means that date is uncertain

Project no.: F-26-R

Sponsor: Minnesota Department of Natural Resources,
Dingell-Johnson Project

Area: Birch Lake; Mayhew Lake; Duncan Lake; West Bearskin Lake

Keywords:

biology, fish, lake trout, fish strains, growth, mortality,
populations, yield, monitoring, survival, fecundity,
reproduction

Description:

OBJECTIVES:

To evaluate the performance of three strains
of lake trout (native Minnesota, Isle Royale
and Marquette or "Michigan") in terms of
survival, growth, maturation, fecundity and
return to the creel when stocked as yearlings
in inland Minnesota Lakes.

Contact:

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Minnesota Department of Natural Resources
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Grand Marais, MN 55604
(218) 387-2535

Ref. no. 143

SLY, P.G.

Ontario - Canada Centre for Inland Waters, Burlington
Great Lakes Laboratory for Fisheries and Aquatic Sciences

LAKE TROUT HABITAT STUDIES

Starting date: 1978

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of the Environment

Area: Eastern Lake Ontario; Western Georgian Bay; Western
Manitoulin Island; east shore Lake Superior; Seneca
Lake; Keuka Lake, New York; Lake Opeongo; Louisa Lake,
Algonquin Park, Canada

Keywords:

biology, fish, lake trout, chemistry, reefs, reproduction,
rehabilitation, carbon dioxide, particulates, ammonia,
habitat, spawning, water quality, Pontoporeia, Amphipoda,
dissolved oxygen, invertebrates

Description:

OBJECTIVES:

To determine characteristics of the habitat which
support successful lake trout spawning and
reproduction.

RESULTS:

Work has included field studies of spawning areas
to analyze for degradation of habitat and water
quality parameters such as dissolved oxygen,
ammonia, carbon dioxide, particulate flux; comparison
of historical and limnological data, studies of
spawning times and locations; and studies of changes
in benthic community in relation to lake trout
population increases.

Contact:

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Ontario Ministry of Natural Resources
Glenora Fisheries Station
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Picton, ON
(613) 476-2400

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 144

SODERBERG, R.W.

Pennsylvania - Mansfield University, Mansfield
Biology Department

EFFECTS OF REARING DENSITY OF PERFORMANCE
OF HATCHERY-REARED LAKE TROUT

Starting date: 01/01/1984

Completion date: 12/30/1986

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, aquaculture, density,
survival, growth

Description:

OBJECTIVES:

To study the effects of rearing density on the
growth and survival of lake trout.

RESULTS:

Lake trout were reared at density indices of 0.25,
0.50, 1.0, and 2.0 in cages suspended in circular
tanks. Water flow rates were such that dissolved
oxygen remained above 8 ppm within all the cages.
Thus treatment effects were attributed to density
and not influenced by water quality. Growth and
condition were not affected by density, but
survival was lower at the higher density than at
the three lower densities. We conclude that lake
trout may be successfully reared at a density index
at least 1.0 if the water requirements for respiration
and waste dilution are met.

Contact:

Dr. Richard W. Soderberg
Biology Department
Mansfield University of Pennsylvania
Mansfield, PA 16933
(717) 662-4277

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 145

SPANGLER, G.R.; JACOBSON, L.D.
 Minnesota - University of Minnesota, St. Paul
 Department of Fisheries and Wildlife;
 Australia - CCAMLR, Tasmania

BIOMASS DYNAMICS OF LAKE TROUT, SALVELINUS NAMAYCUSH,
 IN LAKE SUPERIOR

Starting date: 10/01/1983
 Completion date: 09/30/1986
 * means that date is uncertain
 Project no.: R/F-15
 Sponsor: Minnesota Sea Grant College Program

Area: Lake Superior, northern

Keywords:

model, rehabilitation, stocking, fish, lake trout,
 biomass, mortality, growth, sea lamprey wounding,
 management, populations, biology

Description:

OBJECTIVES:

To (1) produce a detailed, predictive model of biomass dynamics of lake trout, *Salvelinus namaycush*, in Lake Superior; (2) estimate biomass yields, on the basis of the model, that are compatible with lake trout rehabilitation in Lake Superior; and (3) estimate the time required for rehabilitation given specified levels of stocking, harvest, and predation by sea lamprey.

METHODOLOGY:

Information available in the literature, recently developed analytical techniques, and existing data will be used to construct a realistic model for the biomass dynamics of one or more Lake Superior lake trout stocks.

ACCOMPLISHMENTS:

A modified version of Schnute's (1985) difference model was used to study the biomass dynamics of lake trout during 1948-1976. The model was useful for analysis of lake trout data from three of seven statistical districts. Stocked lake trout (hatched and reared in a hatchery, finclipped and released into the lake) and wild trout (not finclipped, presumed to have hatched in Lake Superior) appeared to be almost equally effective in terms of natural reproduction. Survival of lake trout stocked at age II to recruitment at age VIII was not low (24-26%). The principal factors contributing to delayed rehabilitation of lake trout populations during the post-lamprey control period (1962-1976) were high total mortality rates (41-72% annually) and low rates of recruitment (0.15-0.46% per year) at age VIII.

rates during the post-lamprey control period were due primarily to sea lamprey (*Petromyzon marinus*) predation and normal natural mortality.

Contact:

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Department of Entomology and Fisheries and Wildlife
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University of Minnesota
St. Paul, MN 55108
(612) 376-2929

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 146

SPURRIER, J.R.; MORSE, S.D.
Minnesota - Department of Natural Resources, Duluth
Fisheries Section

LAKE SUPERIOR REPORT

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.: F-29-R(P)

Sponsor: Minnesota Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Superior, Minnesota waters

Keywords:

biology, fish, lake trout, monitoring, management,
mortality, sea lamprey wounding, reproduction,
abundance, survival, populations

Description:

OBJECTIVES:

To determine (1) the age structure, catch-per-unit-effort, and mortality; (2) sea lamprey activity; and (3) the degree of natural reproduction.

Contact:

John R. Spurrier
Minnesota Department of Natural Resources
10029 North Shore Dr.
Duluth, MN 55804
(218) 525-1800

Ref. no. 147

STALLING, D.

Missouri - Columbia National Fisheries Research Lab, Columbia

NATIONAL CONTAMINANT BIOMONITORING PROGRAM

Starting date: 7/1977

Completion date: Continuing

* means that date is uncertain

Project no.: Project 881

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan; Lake Superior; Lake Huron; Lake Ontario;
Lake Erie; U.S. rivers

Keywords:

water quality, fish, biology, chemistry, DDT, PCBs, dioxin, toxaphene, chlordane, organics, toxics, analytical methods, pesticides, pattern recognition, furans, monitoring, inorganics, heavy metals, management, contaminants, lake trout, walleye, perch, pollution, tributaries

Description:

Objectives:

To (1) monitor for trends in pesticides, heavy metals and other environmental contaminants in anadromous and freshwater fish collected from designated sampling locations in U.S. rivers and the Great Lakes. Fish are being analyzed for selected highly residual organochlorine and elemental contaminants. In the 3 upper Great Lakes, lake trout is the predator species sampled; in the 2 lower Great Lakes, coolwater species, such as walleye and perch, are collected; (2) identify and assess new or previously undetected contaminants which may threaten the wellbeing of important fishery resources; (3) provide technical assistance in the areas of analytical chemistry and applied toxicology to U.S.F.W.S. biologists and other federal and state agencies; (4) make routine residue analyses more cost-effective and comprehensive through development and implementation of automated procedures and improve analytical methods; and (5) recommend management alternatives for dealing with pollution problems.

Contact:

David Stalling

U.S. Fish and Wildlife Service

Columbia National Fisheries Research Laboratory

RR 1

Columbia. MO 65201

Ref. no. 148

SWAIN, W.R.

Netherlands - University of Amsterdam, Amsterdam
Vakgroep Aquatische Oecologie

LAKE TROUT AND OTHER SALMONID FISHES AS ACCUMULATORS
OF RESIDUE-FORMING, TRACE ENVIRONMENTAL CONTAMINANTS

Starting date: 1975
Completion date: Continuing
* means that date is uncertain
Project no.:
Sponsor:

Area: Lake Michigan; Lake Superior; Isle Royale area

Keywords:

biology, fish, lake trout, monitoring, contaminants,
toxics, human health, human consumption, organics,
PCBs, chemistry, historical, transport

Description:

The research has been oriented toward understanding the transport, fate and, if possible, the effects of contaminants in the Great Lakes, with the use of lake trout and their allies as indicators. It is particularly focused on (1) the historical source of the contaminants in the lake trout of Lake Michigan and the degree to which it has influenced the present levels in fish, and (2) the potential impact of these contaminants on humans who consumed Lake Michigan fish when the levels of contaminants were at their peak in the late 1970's and early 1980's.

Contact:

Dr. Wayland Swain
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University of Amsterdam
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Amsterdam, Netherlands

Ref. no. 149

SWINK, W.D.

Michigan - U.S. Fish and Wildlife Service, Millersburg
Hammond Bay Biological Station

THE EFFECT OF SIZE ON LAKE TROUT SURVIVAL AFTER A SINGLE
SEA LAMPREY ATTACK

Starting date: 05/13/1986

Completion date: 02/01/1987

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service,
Great Lakes Fishery Commission

Area: Laboratory

Keywords:

biology, fish, lake trout, sea lamprey wounding,
size, survival,

Description:

OBJECTIVES:

To compare survival of three sizes of lake
trout after a single sea lamprey attack.

Contact:

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(517) 734-2511

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 150

SWINK, W.D.; HANSON, L.H.

Michigan - U.S. Fish and Wildlife Service, Millersburg
Hammond Bay Biological StationCOMPARISON OF SURVIVAL IN RAINBOW TROUT AND LAKE TROUT
AFTER SEA LAMPREY ATTACK

Starting date: 04/22/1985

Completion date: 02/09/1986

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service,
Great Lakes Fishery Commission

Area: Laboratory

Keywords:

biology, fish, lake trout, sea lamprey wounding,
survival, mortality, rainbow trout

Description:

OBJECTIVES:

To compare the survival of rainbow trout and lake trout to sea lamprey predation.

RESULTS:

Survival was significantly higher ($P < 0.10$) in rainbow trout than in lake trout when the fish were subjected in the laboratory to a single attack by a sea lamprey. Of 77 rainbow trout, 35% died as a direct result of a sea lamprey attack, 5% died of undetermined causes, and 60% survived; for 77 lake trout, the respective percentages were 42, 14, 44. The higher survival of rainbow trout probably resulted from their more aggressive feeding behavior in captivity, greater resistance to secondary infection, and better adaptation to water temperatures higher than 10 C. The location of sea lamprey attachment on the fish was not a factor in the mortality of either species. These results are the first to indicate that survival is higher in one salmonid than in another after a single sea lamprey attack.

Contact:

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 151

SWINK, W.D.; HANSON, L.H.

Michigan - U.S. Fish and Wildlife Service, Millersburg
Hammond Bay Biological StationSURVIVAL FROM SEA LAMPREY PREDATION BY TWO STRAINS
OF LAKE TROUT

Starting date: 04/24/1984

Completion date: 12/21/1984

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service,
Great Lakes Fishery Commission

Area: Laboratory

Keywords:

biology, fish, lake trout, sea lamprey wounding,
fish strains, mortality, survival

Description:

OBJECTIVES:

To compare the survival of two strains of
lake trout (Seneca and Marquette) after one
sea lamprey attack.

RESULTS:

No significant difference was found in the
survival of Marquette and Seneca Lake strains
subjected to a single sea lamprey attack in the
laboratory. The location of sea lamprey
attachment was not a factor in mortality.

Contact:

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Ref. no. 152

SYMULA, J.; SKEA, J.; MEADE, J.W.; BULKOWSKI, L.;
COLQUHOUN, J.

New York - Department of Conservation, Rome
Rome Field Toxicant Unit;
Pennsylvania - U.S. Fish and Wildlife, Wellsboro
National Fishery Research and Development Laboratory

BLUE SAC DISEASE IN LAKE ONTARIO LAKE TROUT

Starting date: 1979

Completion date: 1985

* means that date is uncertain

Project no.:

Sponsor: New York Dept. of Conservation, U.S. Fish and
Wildlife Service

Area: Lake Ontario, eastern end

Keywords:

biology, fish, lake trout, pathology, mortality, survival,
eggs

Description:

OBJECTIVES:

To determine the cause of high blue sac loss
in Lake Ontario lake trout.

Contact:

J. Symula
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Field Toxicant Research Unit
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Rome, NY 13440

Ref. no. 153

TALHELM, D.R.

Michigan - Michigan State University, East Lansing
Department of Biology

SOCIAL ASSESSMENT OF FISHERY RESOURCES

Starting date:

Completion date:

* means that date is uncertain

Project no.:

Sponsor:

Area: Lake Michigan; Lake Ontario; Lake Huron; Lake Erie;
Lake Superior

Keywords:

biology, fish, lake trout, management, economics, sociology

Description:

The project is a symposium on the social assessment
of fishery resources.

Contact:

Dr. Daniel R. Talhelm
531 Gainsborough
East Lansing, MI 48823

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 154

TODD, T.; O'CONNOR, D.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

IDENTIFICATION OF LAKE TROUT STRAINS USING ELECTROPHORETIC
AND IMMUNOLOGICAL METHODS

Starting date: 10/1985

Completion date: 09/1988

* means that date is uncertain

Project no.: 973.6010

Sponsor: U.S. Fish and Wildlife Service

Area: Laboratory

Keywords:

biology, fish, lake trout, genetics, fish strains,
origin, stocking

Description:

Current rehabilitation plans for the Great Lakes require intensive stocking of several strains of lake trout. In order to evaluate the success of strain-specific stocking programs, one needs to be able to identify field collected fish to strain of origin. It is therefore imperative that we develop methods to differentiate and identify young produced by the various strains stocked in the lakes and any products of interbreeding, should it occur. By employing four different electrophoretic methods and one immunological technique we will attempt to delineate genetic profiles and differences between strains. These 'markers' will be used for strain identification and for forensic identification of lake trout.

Contact:

T. Todd

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 155

WAGNER, W.C.

Michigan - Michigan Department of Natural Resources, Marquette
Marquette Fisheries Station

ASSESS SURVIVAL OF PLANTED LAKE TROUT EGGS
IN THE UPPER GREAT LAKES

Starting date: 1976

Completion date: 1990

* means that date is uncertain

Project no.: F-53-R, Study 415

Sponsor: Michigan Department of Natural Resources,
Dingell-Johnson Project

Area: Lake Huron; Les Cheneaux; Pomeroy Reef; Drummond Island

Keywords:

biology, fish, lake trout, monitoring, eggs, populations,
reefs, survival, stocking

Description:

OBJECTIVES:

To determine the potential of egg plants for
establishing self-sustaining populations of lake
trout by assessing survival of eyed eggs 2 months
after swim-up and to maturity.

Contact:

Wilbert C. Wagner
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Marquette Fisheries Station
Research and Assessment Unit
484 Cherry Creek Road
Marquette, MI 49855
(906) 249-1611

Ref. no. 156

WALLACE, R.G.

Saskatchewan - Department of Parks and Renewable Resources, La Ronge
Fisheries Branch

LAKE TROUT IN SASKATCHEWAN: PREDICTING PRESENCE AND ABUNDANCE FROM
HABITAT CRITERIA

Starting date: 1983

Completion date: 1988

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of Parks and Renewable Resources

Area: 340 Lakes in northern Saskatchewan

Keywords:

biology, fish, lake trout, abundance, habitat, dispersal, model,
monitoring

Description:

Provincial lake surveys, EIA reports since 1950 and gillnet
abundance are used to predict presence or absence of lake trout.
The effects of paleoclimate and post-glacial dispersal are under
analysis.

Contact:

Robert G. Wallace
Government of Saskatchewan
Department of Parks and Renewable Resources
Fisheries Branch
Box 5000
LaRonge, SK S0J 1L0
(306) 425-4580

Ref. no. 157

WEBER, J.

Michigan - Michigan Department of Natural Resources, Alpena
Alpena Fisheries Station

EVALUATION OF LAKE TROUT STOCKS IN LAKE HURON

Starting date: 04/01/1986

Completion date: 03/31/1991

* means that date is uncertain

Project no.: F-53-R, Study 451

Sponsor: U.S. Fish and Wildlife Service, Dingell-Johnson
Project

Area: Lake Huron; Rogers City to Harbor Beach, Michigan

Keywords:

biology, fish, lake trout, management, monitoring,
rehabilitation

Description:

OBJECTIVES:

To determine stock parameters for lake trout
in Lake Huron from index sampling for use in
management decisions necessary to reach the
rehabilitation goal.

Contact:

John Weber

Michigan Department of Natural Resources

4343 M-32 West

Alpena, MI 48707

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 158

WEBER, J.

Michigan - Michigan Department of Natural Resources, Alpena
Alpena Fisheries Station

NATURAL REPRODUCTION OF LAKE HURON LAKE TROUT

Starting date: 04/01/1986

Completion date: 03/31/1991

* means that date is uncertain

Project no.: F-53-R, Study 452

Sponsor: U.S. Fish and Wildlife Service, Dingell-Johnson
Project

Area: Lake Huron, Rogers City to Harbor Beach, Michigan

Keywords:

biology, fish, lake trout, spawning, reproduction,
recruitment, populations, monitoring

Description:

OBJECTIVES:

To (1) determine the location and extent of
early reproductive success; (2) follow the
relative recruitment between natural and
stocked lake trout; and (3) determine when
natural reproduction reaches historical levels.

Contact:

John Weber
Michigan Department of Natural Resources
4343 M-32 West
Alpena, MI 48707

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 159

WELCH, H.E.; MARTIN-BERGMANN, K.; MILLS, K.E.
Manitoba - Department of Fisheries and Oceans, Winnipeg
Freshwater Institute

RESPONSE OF LAKE TROUT AND CHAR POPULATIONS TO FERTILIZATION
AT SAGVAGJVAC, NORTHWEST TERRITORIES.

Starting date: 1977

Completion date: 1983

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of Fisheries and Oceans

Area: 63 N, NW coast of Hudson Bay

Keywords:

biology, fish, lake salmonid, salmonid, lake fertilization

Description:

This project examined the effects of lake
fertilization on lake trout and char populations.
Results not published yet.

Contact:

Dr. H. E. Welch
Freshwater Institute
Department of Fisheries and Oceans
501 University Crescent
Winnipeg, Manitoba R3T 2N6

Ref. no. 160

WELLINGTON, R.

Pennsylvania - Erie County Department of Health, Erie

ANALYSIS OF LAKE TROUT FOR ORGANIC CONTAMINANTS

Starting date: *

Completion date: continuing

* means that date is uncertain

Project no.:

Sponsor: County of Erie

Area: Lake Erie, Pennsylvania waters

Keywords:

biology, fish, lake trout, chemistry, organics,
PCBs, DDT, chlordane, aldrin, dieldrin, pesticides

Description:

Spot check for contaminant levels of various organic
pesticides.

Contact:

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606 W. 2nd Street
Erie, PA 16507
(814) 454-5811

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 161

WELLS, L.

Michigan - National Fisheries Center--Great Lakes, Ann Arbor

SURVEILLANCE AND STATUS OF FISH POPULATIONS -- LAKE MICHIGAN

Starting date: 1/1970

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: U.S. Fish and Wildlife Service

Area: Lake Michigan

Keywords:

fish, biology, bloater chub, alewife, yellow perch, smelt, growth, deepwater sculplt, slimy sculpin, monitoring, populations, mortality, reproduction, diet, lake trout, whitefish, abundance, salmonid, management, distribution, forage base, sea lamprey control

Description:

Regular, systematic sampling each year with trawls, gillnets, tow nets and other gear yields detailed information on abundance, distribution, size/age composition, growth, mortality, maturity, and diet for Lake Michigan lake trout, chub, whitefish, yellow perch, and preyfish resources, as well as data on degree of success of sea lamprey control and lake trout rehabilitation programs. This critical information forms the basis for research by U.S.F.W.S. in cooperation with other agencies to (1) determine the status of the stocks; (2) evaluate the impact of the fisheries; (3) develop new interagency management plans; (4) predict total allowable catch of chub, lake trout, and whitefish in treaty-ceded waters; (5) determine capacity of prey-fish stocks to sustain present or increased levels of salmonid predation.

Contact:

LaRue Wells

U.S. Fish and Wildlife Service

National Fisheries Center--Great Lakes

1451 Green Road

Ann Arbor, MI 48105

(313) 994-3331

Ref. no. 162

WHITTLE, D.M.

Ontario - Great Lakes Laboratory for Fisheries and Aquatic
Sciences, Burlington

GREAT LAKES FISH CONTAMINANTS SURVEILLANCE PROGRAM

Starting date: 1977

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Canadian Department of Fisheries and Oceans

Area: Lake Superior; Lake Ontario; Lake Erie; Lake Huron

Keywords:

biology, fish, lake trout, toxics, contaminants,
monitoring, forage base

Description:

OBJECTIVES:

To (1) describe trends in burdens of persistent
toxic substances in representative Great Lakes
top predator and forage fish species together
with major invertebrate dietary items;
(2) identify the significance of recently
detected contaminants; and (3) describe the
potential to impact on the fishery resources
of the Great Lakes.

Contact:

Mike Whittle

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Ref. no. 163

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Bayfield
Lake Superior Office

SPRING LAKE TROUT ASSESSMENT

Starting date: 04/1986

Completion date: 05/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Superior; Apostle Islands

Keywords:

biology, fish, lake trout, monitoring, management,
mortality, sea lamprey wounding, diet, biomass, length

Description:

Forty stations were sampled in the Apostle Islands to monitor biological parameters of lake trout. Data on length, weight, age, sea lamprey marks, food habits, catch-per-unit-of-effort, and mortality were collected. Sea lamprey wounding indicates a downward trend over the past 15 years. Catch-per-unit-of-effort has been increasing over the past four years. Natives grew faster than hatchery fish in almost every age cohort, however native aging problems may underestimate actual age. Condition factors have changed little during the past three years. Smelt were the most important food item for both native and hatchery fish. Total annual mortality was estimated at 74.4% for the W-2 management zone, although the calculation method is questionable.

Contact:

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Wisconsin Department of Natural Resources
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Bayfield, WI 54814
(715) 779-3346

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 164

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Bayfield
Lake Superior Office

LAKE TROUT EGG SEEDING USING ASTRO-TURF BUNDLES

Starting date: 10/1985

Completion date: 07/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Superior; Devil's Island Shoal

Keywords:

biology, fish, lake trout, eggs, reefs, fish strains

Description:

In the fall of 1985, the Lake Superior Work Unit placed 0.8 million lake trout eggs, encased in 57 astro-turf bundles, on Devil's Island Shoal, and 1.0 million eggs in 71 bundles off Eagle Island. Egg sources were native Gull Island stock for Devil's Island Shoal, and Iron River National Fish Hatchery (Lake Superior strain) brook stock for Eagle Island.

Hatch and escape rates were 80.0% for Devil's Island Shoal and 75.8% for Eagle Island. Total post sac-fry production for Devil's Island Shoal was 656,640 and for Eagle Island, 758,862. Estimated spawner production during 1991-1998 for Devil's Island Shoal and Eagle Island were 1,116 and 1,290 fish, respectively.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 165

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Bayfield
Lake Superior Office

LAKE TROUT SPAWNING ASSESSMENT

Starting date: 10/1986

Completion date: 10/1986

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Superior; Apostle Islands; Devil's Island Shoal

Keywords:

biology, fish, lake trout, spawning, populations,
monitoring, mortality, eggs, reefs, sport fishing,
abundance, reproduction

Description:

Annual lake trout spawning assessments were made in the Apostle Islands area. The Gull-Michigan Island Shoal spawning population increased from 1985 in estimates of overall population size, but decreased in catch-per-unit-effort (CPE). Decreases in fish over 29.0 inches were assumed to be a result of fishing mortality. Egg deposition on Gull-Michigan Island Shoal was approximately 28.5 million eggs in 1986. A total of 696,000 eggs were collected in 1986 for lake trout and splake programs.

Sand Cut Reef CPE declined while the percentage of females was the second highest since sampling began in 1964. Van Tassells Point CPE continues to decrease, but percent females remained relatively stable. Native abundance remains extremely low.

U.S. Fish and Wildlife Service sampling of Devil's Island Shoal and Otter Island Reef found spawning abundances at very low levels.

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(715) 779-3346

Ref. no. 166

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Madison

STOCK LAKE TROUT YEARLINGS AND EVALUATE

Starting date: 1984

Completion date: 1985

* means that date is uncertain

Project no.: PMN 856

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Superior

Keywords:

biology, fish, lake trout, imprinting, reefs, spawning,
movement, survival, homing, monitoring, management

Description:

This project will stock 50,000 coded wire tagged and 50,000 morpholine imprinted hatchery reared lake trout on historical spawning reefs. The objective of this project is to compare movement and survival of various sizes and imprinting treatments. The results of this project will refine lake trout stocking methodology to maximize survival and homing to spawning reefs.

Contact:

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Bureau of Fish Management
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Box 7921
Madison, WI 53707
(608) 267-7501

Ref. no. 167

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Madison

LAKE SUPERIOR SALMONID CREEL CENSUS

Starting date: 1983

Completion date: 1985

* means that date is uncertain

Project no.: PMN 858, PMN 812

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Superior; tributaries

Keywords:

biology, fish, lake trout, creel census, sport fishing, movement, survival, growth, reproduction, salmonid, chinook salmon, splake, Nipigon brook trout, brown trout, rainbow trout, monitoring, management, tributaries, stocking

Description:

This project will estimate angler effort and catch of stocked salmon and trout from Lake Superior and its tributaries. Data will be collected on movement, survival, growth and reproduction of stocked salmonids. This project will provide essential tag return data to evaluate the stocking of chinook salmon, wild strain lake trout, splake, wild Nipigon brook trout, wild-domestic brown trout, and wild Pikes Creek rainbow trout.

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LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 168

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Wisconsin Department of Natural Resources, Madison
Bureau of Fish Management

LAKE MICHIGAN SALMONID CREEL CENSUS

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Michigan

Keywords:

recreation, biology, creel census, sport fishing, salmonid,
lake trout, rainbow trout, brown trout, coho salmon,
chinook salmon, salmon, trout, fish, management, stocking,
distribution

Description:

This project will evaluate the stocking of trout and salmon in terms of return to anglers. Total harvest, total effort, catch-per-effort, species composition of catch, and geographical distribution of catch will be estimated. This project provides essential feedback concerning the current stocking program and will suggest program alterations to maximize stocking effectiveness.

Contact:

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Ref. no. 169

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Department of Natural Resources, Sturgeon Bay
Lake Michigan Fisheries Station

LAKE TROUT RESTORATION

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Michigan; Mid-Lake Reefs off of Port Washington;
Clay Banks Reef off of Sturgeon Bay; Green Bay

Keywords:

biology, fish, management, lake trout, monitoring,
rehabilitation, homing, abundance, reefs,
populations, commercial fishing, sea lamprey wounding,
survival, eggs, mortality, contaminants, larval fish,
chemistry, organics, toxaphene, PCBs, dieldrin, chlordane,
fish strains, toxics

Description:

OBJECTIVES:

To (1) describe the relative abundance and spawning population of lake trout on selected spawning reefs; (2) determine the movement, homing to spawning reefs, removal by commercial fishing, and performance of all stocked lake trout; (3) determine the extent of lamprey wounding and scarring on lake trout from Lake Michigan and Green Bay; (4) evaluate various stocking techniques, whenever possible, for their usefulness as a rehabilitation goal; (5) determine the survival of lake trout eggs and fry deposited on spawning reefs; (6) develop assessment techniques to detect naturally spawned fish at an age earlier than three; and (7) determine the affect of contaminants such as PCBs, dieldrin, toxaphene, and chlordane on lake trout egg survival.

Contact:

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Wisconsin Department of Natural Resources
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Sturgeon Bay, WI 54235
(414) 743-6408

LAKE TROUT PROJECTS - 1985-CONTINUING

Ref. no. 170

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Wisconsin Department of Natural Resources, Madison
Bureau of Fish Management

STOCK SPLAKE AND EVALUATE

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Michigan; Green Bay; Marinette

Keywords:

management, fish, stocking, splake, genetics, creel census,
fish strains, sport fishing, lake trout, brook trout

Description:

This project will stock four lots of 10,000 splake in Green Bay near Marinette. Two lots of yearlings and fingerlings will be planted. F1 crosses will be made using female Lake Michigan lake trout and hatchery or wild Lake Nipigon male brook trout. Evaluation will be made through the regular creel census and experimental gear. The goal of this project is to create a winter fishery for splake in the Marinette area. A similar fishery has been developed in Chequamegon Bay of Lake Superior.

Contact:

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Ref. no. 171

WISCONSIN DEPT. NAT. RESOURCES.

Wisconsin - Wisconsin Department of Natural Resources, Madison
Bureau of Fish Management

STOCK LAKE TROUT AND EVALUATE

Starting date: *

Completion date: Continuing

* means that date is uncertain

Project no.:

Sponsor: Wisconsin Department of Natural Resources

Area: Lake Michigan; Wind Point Shoal; Black Can Reef;
Northeast Reef; Sheboygan Reef

Keywords:

management, biology, lake trout, fish, stocking,
spawning, survival, reefs, movement, distribution,
fish strains, rehabilitation, growth, sport fishing,
commercial fishing

Description:

This project will stock lake trout in southern and northern Lake Michigan. In southern Lake Michigan, approximately 500,000 lake trout will be stocked annually and survival evaluated by spawning. Stocking and assessment activities will take place on Wind Point Shoal, Black Can Reef, Northeast Reef, and Sheboygan Reef. The Domestic (Superior), Green Lake, Seneca Lake and Jenny Lake strains will be evaluated to determine which species should be stocked. Movement and association to stocking location of planted lake trout will also be determined.

In northern Lake Michigan, 100 to 200 thousand lake trout of different strains will be stocked on historic spawning reefs. Survivability, movement, growth rates, and reproduction will be compared among strains. Assessment data will be obtained through the monitoring of commercial and sport fisheries and by assessment fishing by WIDNR. This project will contribute to the reestablishment of lake trout and identify lake trout strains that are best for stocking in Lake Michigan.

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