

Annual Report of the Great Lakes Fishery Commission

1998



Photos: Great Lakes Fishery Commission



Personnel from several agencies partnered in the Great Lakes Fishery Commission in 1998 to carry out the St. Marys River treatment and other initiatives.



From the Chair
Burton Ayles

Partnerships Contribute to Successes in 1998

The ecosystem approach to management was widely adopted in the Great Lakes region several decades ago, and for good reason. Because natural resources do not respect human boundaries, cooperation and partnership must be the way we work in the region. Partnerships in Great Lakes resource management are indeed the bonds that hold much of what we do together. Without partnerships, scarce resources would be wasted, precious goodwill would be squandered, and, ultimately, the valuable Great Lakes resources would suffer.

When one considers that millions of people rely on the Great Lakes for food, water, recreation, and livelihoods; that multiple jurisdictions have the responsibility to manage the resources; and that there are often conflicting opinions about management; it is no wonder that without preponderant partnerships, successful management initiatives would be few and far between.

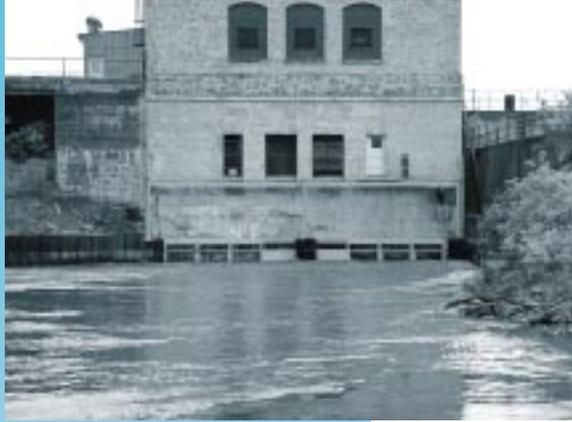
In 1998, many of the Great Lakes Fishery Commission's important initiatives relied on existing partnerships or nurtured new ones. Highlights of 1998, for instance, include:

BOLD ACTION ON THE ST. MARYS RIVER. In July, 1998, the commission carried out the first round of granular Bayluscide spot treatments on the River. The spot treatments, combined with the continuing release of large numbers of sterile males and trapping, puts us well on our way toward the rehabilitation of the Lake Huron and northern Lake Michigan fisheries. The Bayluscide treatment was carried out efficiently and with precision. Preliminary information from the treatment indicates that the lampricide is effective in removing sea lamprey larvae and has had the expected minimal affect on non-target species. This operation would not be possible without hard work and commitment by many people and agencies.

VIGOROUS RESEARCH THROUGH THE PARTNERSHIP IN ECOSYSTEM RESEARCH AND MANAGEMENT— OR PERM — PROGRAM. The commission joined PERM in 1997 and strengthened this important partnership in 1998. PERM is a cooperative effort between Michigan State University, the commission, the U.S. Geological Survey, the State of Michigan, and the Hammond Bay Biological Station. Through the PERM partnership, research ranging from sea lamprey pheromones—led by Dr. Weiming Li—to compensatory mechanisms in sea lampreys—led by Dr. Mike Jones—will help deliver new and innovative alternative control techniques to the commission. The high quality of science delivered through PERM is reflected in the increasing level of monetary grants the program receives from a variety of sources.

Partnerships *continued*

CRITICAL REVIEW OF THE SEA LAMPREY BARRIER PROGRAM. In 1998, the commission began a top-to-bottom review of the sea lamprey barrier program to focus on ways to improve engineering, streamline costs, and ensure fish passage. The Barrier Transition Team—set up to conduct this review—will establish rigorous protocols that will allow a smooth transition by the year 2001 from the experimental stage of the barrier program to a fully operational one. Because of this review process, exciting and innovative barrier technologies will further improve our ability to deliver sea lamprey control with a minimum of lampricides.



The U.S. Army Corps of Engineers houses a major sea lamprey trap at the Soo locks in Sault Ste. Marie, MI.

ENHANCED PARTNERSHIP WITH THE U.S. ARMY CORPS OF ENGINEERS.

In 1998, measures were introduced in the U.S. Congress to authorize the corps to partner with the commission on sea lamprey trap and barrier projects. Members of Congress have expressed enthusiasm about the GLFC/corps partnership and are optimistic that funding under the authorization will take place. Because we have already worked successfully with the corps on other projects, the commission is, of course, very excited about anything that will strengthen this already positive partnership.

COOPERATION WITH THE INTERNATIONAL JOINT COMMISSION.

In 1998, the GLFC partnered with the IJC on investigating such things as aquaculture and water levels, as these issues relate to the fishery. We intend to strengthen this partnership in the future.

CONTINUED, STRONG COMMITMENT BY THE AGENCIES TO A JOINT STRATEGIC PLAN FOR MANAGEMENT OF GREAT LAKES FISHERIES. The Joint Strategic Plan, as we all appreciate, brings a high level of cooperation to the day-to-day and long-term management of the fishery. The commission is pleased to report that 1998 brought a continued commitment to sound science and consensus-based management, as called for under the Plan.

The people of the Great Lakes region should be very proud of the level of professionalism, consensus, and cooperation that goes into management of the fishery. The Great Lakes Fishery Commission remains committed to implementing its mandate under the *Convention on Great Lakes Fisheries* and to finding ways in which the entire Great Lakes community can take advantage of each others' expertise and willingness to work together.

Sea Lamprey Control

Sea lamprey control is probably the commission's most visible responsibility in the Great Lakes. The commission's sea lamprey control program—rooted in the *Convention on Great Lakes Fisheries* and reinforced in the *Strategic Vision for the Decade of the 1990s*—has reduced sea lamprey populations by 90% in most areas of the Great Lakes. This level is necessary to allow the management agencies to achieve Fish Community Objectives. The sea lamprey control program is carried out in cooperation with the Department of Fisheries and Oceans in Canada and the U.S. Fish and Wildlife Service in the United States.

In 1998, lampricide treatments were conducted in 57 tributaries in the Great Lakes. Larval assessment crews surveyed 357 tributaries, inland lakes, and lentic areas to assess control effectiveness, to plan future lampricide treatments, and to establish production capacity of streams. Assessment traps were operated in 63 tributaries to estimate the spawning-phase population in each Great Lake.

Sea lamprey control in support of Fish Community Objectives remains the cornerstone of sea lamprey management decisions made by the commission. In 1998, sea lamprey abundance in Lake Superior was near the target level. In Lake Michigan, spawning sea lampreys were



relatively stable during 1986-1998, although lampreys were more abundant in the northern part of the lake than in the southern. Populations of parasitic lampreys remained significantly higher than the target objective in Lake Huron, because of the continued high production of sea lamprey from the St. Marys River. The lamprey management program met the target objective in Lake Erie and was slightly above the objective for Lake Ontario during 1998.

In 1998, the commission and its agents began the lampricide phase of sea lamprey control on the St. Marys River (the large-scale release of sterilized male sea lampreys and enhanced trapping on the St. Marys River commenced in 1997). A total of 459.8 kg (1013.7 pounds) of granular Bayluscide was applied to 82.2 ha (200 acres) of the river in 1998, with a helicopter by a contracted pesticide application firm. Personnel from both Fisheries and Oceans Canada and the U.S. Fish and Wildlife Service, along with partners from the U.S. Geological Survey, the Chippewa-Ottawa Treaty Fishery Management Authority, the Michigan Department of Natural Resources, and the Ontario Ministry of Natural Resources, cooperated in the successful treatment application. Evaluation of the treatment indicated a 76% reduction from pretreatment larval densities with minimal nontarget mortality.

The Lampricide Control Task Force continued to implement options for reducing lampricide use, consistent with the commission's *Strategic Vision for the Decade of the 1990s*, which calls for a 50% reduction in TFM use by 2001. As of the end of the 1998 field season, TFM use had been reduced by 31% from the average use of the 1980s. The Manistee River (Lake Michigan tributary) was treated by an international crew in a single coordinated effort which saved about 4,000 kg (8818.5 pounds) of TFM, or 10% of total TFM use.

The Sterile Male Release Technique Task Force focused on the 3rd year of a 4-year assessment project (long term study) in Lake Superior streams and the 2nd year of enhanced release of sterile males as a part of the integrated control program in the St. Marys River. The long-term study, which is evaluating the success of the technique, has called for the release of lampreys into eight Lake Superior streams and determined nesting success in the streams, and is in the process of determining density dependent effects within the larval lamprey populations. The St. Marys River received 16,743 sterilized male sea lampreys, creating a 2.2:1 sterile:untreated male ratio. The operation of the sterilization facility continued to meet the demands of the program.

The Sea Lamprey Barrier Task Force began a two-year transition of the barrier program from a developmental process to a fully operation part of the sea lamprey control program in 1998. The task force continued to direct research efforts into the combination fixed-crest and electrical barrier and biological impacts of barriers. To date, 61 barriers have been constructed or modified on Great Lakes tributaries to stop sea lamprey migration. During 1998, 4 barriers were in the process of construction, 5 existing barriers were modified to prevent passage of spawning sea lampreys, and construction of a fishway began at an electrical barrier.

The Sea Lamprey Integration Committee established its Assessment Task Force during 1996 to optimize operations of the larval and adult assessment programs. The task force completed the review of the St. Marys River Assessment Plan by an external review panel and began implementation of the recommendations during 1998. Recommendations of the adult assessment review (peer reviewed during 1997) continued implementation and included estimation of the parasitic population in Lake Huron, estimation of the transformer population in Lake Superior, and redistribution of trapping effort from small to large streams. The task force, in cooperation with the commission's secretariat and a contracted private company, developed an Empirical Stream Treatment Ranking (ESTR) model designed to rank streams for lampricide treatment. Also, the Task Force developed projections of transformer production and submitted TFM treatment recommendations for the 1999 field season to the Sea Lamprey Integration Committee.

Ellie Koon of the U.S. Fish and Wildlife Service describes a new sea lamprey barrier design to Commissioner Joe Day (right), commission Chair Burton Ayles (middle), and Executive Secretary Chris Goddard (left).



The first aerial application of the lampricide granular Bayluscide took place on the St. Marys River in 1998.



Habitat restoration on a Great Lakes stream.

Photo: OMNR

Fishery Management, Research, and Environment

The Great Lakes community relies on science as the foundation for its management activities. The goals of the *Convention on Great Lakes Fisheries*—which state in part that healthy Great Lakes fisheries depend on science—are supported by advice from the Great Lakes Fishery Commission's Board of Technical Experts, Habitat Advisory Board, Sea Lamprey Integration Committee, Lake Committees and their technical committees, and the Great Lakes Fish Health Committee.

Based on recommendations from its boards, the commission in 1998 approved research projects under the following categories:

Alternative Control

- Large scale production of petromyzonol sulfate
- Chemical composition of larval lamprey pheromone
- Identification, function, and potential application of a male sea lamprey pheromone
- Potential use of steroids for sterilizing male sea lampreys
- Seasonal effects on fish of sea lamprey predation in the Great Lakes
- The potential to use sea lamprey statoliths (ear bones) to identify natal streams
- Compensatory mechanisms in Great Lakes sea lamprey populations

Internal Research

- Measuring the survival of fall and spring migrating sea lampreys
- Long-term evaluation of sterile-male-release
- Classification of lake habitat of sea lamprey larvae
- Annual thermal habitat use by lake trout

Board of Technical Experts

- Examining the role of biodiversity in managing Great Lakes fishery resources
- Linking habitat supply to fish population dynamics

Integrated Management of Sea Lamprey Protocol

- Lake Huron sea lamprey and lake trout models
- Recreational fishing value of sea lamprey control
- Decision analyses for sea lamprey management
- Effect of sea lamprey barriers on fish communities

Other Partnerships

- Model management program for private aquaculture
- Identification of Aquatic Biodiversity Investment Areas (ABIAs) in the Great Lakes
- Lake-wide population model for Lake Superior
- DNA-based markers for assessing genetic population of yellow perch



The Great Lakes Fishery Commission sponsored research on assessing genetic population of yellow perch.

Under its *Strategic Vision for the Decade of the 1990s*, the commission reaffirms its commitment to the ecosystem approach to decision making and the importance of healthy ecosystems to a sustainable fish community. The vision recognizes that “all components of the ecosystem (such as nutrients, primary production, forage fish, predatory fish, habitat, chemical contaminants, climate, and human use) interact with each other and therefore must be considered in terms of their system-level effects.

Based on this commitment to healthy ecosystems, the commission, in 1998, undertook several initiatives in support of healthy Great Lakes ecosystems. For instance, the commission:

- confirmed its commitment to supporting the Lake Huron Fish Community Objectives;
- pledged to provide support for the 1999 International Coregonid Symposium;
- thanked the Habitat Advisory Board for development of a draft Declaration for the Conservation and Rehabilitation of Aquatic Habitats in the Great Lakes, urged its consideration by lake committees, and asked that all interested publics have an opportunity to comment. The draft declaration identified several areas of science as priorities, including the relationship between fish biodiversity and the quality/quantity of fish habitat, the relationship between the spatial distribution of habitat and the recruitment of fish, the location of threatened habitats, and understanding how persistent toxic substances affect fish survival. The commission reiterated its commitment to monitoring proposals that may affect significant or essential fisheries habitat in the Great Lakes basin;
- began the revision of its *Strategic Vision of the Decade of the 1990s*. The updated vision, when completed by 2001, is expected to continue to highlight the importance of healthy ecosystems, partnerships, and sea lamprey control;
- wrote the International Joint Commission urging reinstatement of lakewide monitoring of phosphorus loading to Lake Erie, in light of the historical decline and continuing year-to-year variation of phosphorus loading rates in Lake Erie and the critical role that phosphorus plays in driving fisheries productivity in Lake Erie;
- supported funding for the Lake Erie Habitat Supply Analysis project.



Photo: OMNR

The Great Lake Fishery Commission's Habitat Advisory Board produced a draft declaration in 1998 to reiterate the importance of habitat on fish communities and to identify habitat restoration priorities.



Photo: Dr. Peter Sorensen

Sea lamprey's olfactory system. The Great Lakes Fishery Commission supported research in 1998 to better understand sea lamprey sex attractants and how they could be used as a control method.

Partnerships

Highlights of 1998 Lake Committee Actions

Under *A Joint Strategic Plan for Management of Great Lakes Fisheries* the state, provincial, and tribal fishery managers meet annually as lake committees to discuss the state of the fishery and to strategize on ways to achieve their joint objectives. The following are highlights of 1998 Lake Committee actions.

THE LAKE SUPERIOR COMMITTEE stressed the importance of a Lake Superior acoustics survey and pledged to prepare an outline for such a survey. The committee supported the continued development of a lake trout population model and approved an Isle Royale lake trout study. The committee affirmed its willingness to cooperate with the Lake Superior Binational Program and suggested a closer connection between the work of the program and the achievement of fish community objectives.

THE LAKE MICHIGAN COMMITTEE formed a Whitefish Task Group to review and consolidate available information on the stock structure and spawning site distribution of whitefish caught in Green Bay. The committee also asked its lake trout task group to review existing information pertaining to lake trout restoration and revise the lake trout rehabilitation plan accordingly. The committee agreed to work with Michigan State University's PERM program to assist in the development of a framework to analyze triggers for chinook salmon stocking decisions.

THE LAKE HURON COMMITTEE supported working with Michigan State University's PERM program to outline options for determining chinook salmon natural reproduction and to produce a 4-year plan for agency use.

The committee agreed to draft a terms of reference for the St. Marys River task group and to focus on assessment of the sea lamprey treatment on the river. The committee agreed to review information about the Lake Huron Watershed Initiative and consider ways in which Georgian Bay and North Channel data could be included.

THE LAKE ERIE COMMITTEE supported the development of a lower trophic level sampling program and a hydroacoustics program to assess important forage fish stocks in the central and eastern basin. The committee noted an increase in sea lamprey attack rates in Lake Erie and declining lake trout numbers. The committee expressed its strong commitment to sound science as the basis for management of Lake Erie fisheries and noted the high level of cooperation among the fishery agencies on Lake Erie to ensure that the critical fisheries data series is maintained. The committee recognized that major changes are occurring in Lake Erie that appear to be driven by changes in the low end of the food chain. The committee also reiterated its concern about further changes in phosphorus loadings to the lake until the Great Lakes community comes to a scientific understanding of how such changes will influence the composition and productivity of fish communities.

THE LAKE ONTARIO COMMITTEE recognized a significant window of opportunity to reintroduce the extirpated bloater chub and pledged to produce an operation and assessment plan. The committee completed the Lake Ontario Atlantic Salmon Rehabilitation Plan and submitted it for publication. The committee recognized the importance of the cormorant issue and noted that studies are being conducted on fish predation by cormorants.



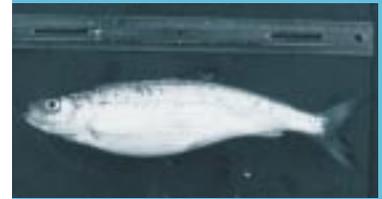
Chinook salmon stocking in a Great Lakes tributary.

THE COUNCIL OF LAKE COMMITTEES urged repeal of an NPDES-permit exemption for ballast discharge under the Clean Water Act. The committee also urged the Great Lakes Fishery Commission to heighten its concern over ballast introductions of exotic species.

THE COUNCIL OF GREAT LAKES FISHERY AGENCIES recommended that each lake committee outline a communications framework (however informal) and that agency communications people attend lake committee meetings for background and for developing lake committee initiatives specified in each lake's plan. The council expressed enthusiasm for the reauthorized Fish and Wildlife Restoration Act and urged full appropriations under the act for projects.

THE GREAT LAKES FISH HEALTH COMMITTEE reiterated the importance of research and management strategies employed at weirs and hatcheries to combat Early Mortality Syndrome in salmonids of Lake Michigan and elsewhere. The committee provided guidance to the GLFC on a protocol to evaluate the disease status of Atlantic sea lamprey which may be utilized in the Great Lakes sterile-male-release program. The committee expressed concern about the implications of ever more sensitive diagnostic techniques for its Model Program for Fish Health Management in the Great Lakes.

THE COMMITTEE OF ADVISORS urged funding to assess the impact, management, and control strategies for cormorants in the Great Lakes. The committee noted the need for cormorant control in the Great Lakes basin and recommended financial support for agencies to assess and address the damage caused by cormorants. The committee noted the outstanding performance of Dr. Charles Krueger as member and Chair of the Great Lakes Fishery Commission. Krueger's term as commissioner expired in 1998. The commission welcomed Gerald May, Rick Kustich, and Edmund Sander from New York and Kelley Smith, Steve Scott, Joan Duffy, and Gary Towns, representing the Michigan Department of Natural Resources, to the Committee of Advisors.



Bloater chub.



Photos: U.S. Fish and Wildlife Service

Advisors urged more aggressive assessment of cormorant populations in the Great Lakes.

Budget

The commission received the following contributions from the governments of the United States and Canada, and from the State of Michigan (shown in U.S. dollars) for 1998.

	U.S.	CANADA	TOTAL
Sea Lamprey Management and Research	\$7,608,500	\$2,976,862	\$10,585,362
General Research Committee and Scientific Support, and Administration	\$744,500	\$468,425	\$1,212,925
Total Federal Government Contributions	\$8,353,000	\$3,445,287	\$11,798,287
State of Michigan Contribution for Sea Lamprey Management on the St. Marys River			\$3,000,000
TOTAL			\$14,798,287

The commission gratefully acknowledges a contribution of \$3 million from the State of Michigan for sea lamprey control on the St. Marys River.

The commission's trust fund received donations from the Michigan Steelhead and Salmon Fisherman's Association, Donna and Burt Atkinson, Pam and Ed Makauskas, Harriet and Vermont Johnson, and Mary and Dick Reuss.



Great Lakes Fishery Commission

The Great Lakes Fishery Commission was established by the Convention on Great Lakes Fisheries (between Canada and the United States) in 1955 to improve and perpetuate fishery resources.

COMMISSIONERS, 1998

- Burton Ayles, Chair
- David Balsillie (Can.)
- Bill Beamish (Can.)
- Jamie Rappaport Clark (U.S.)
- Joseph Day (U.S.)
- David Dempsey, (alternate U.S.)
- Bernie Hansen, Vice-Chair (U.S.)
- Ray Pierce (Can.)
- Roy Stein (U.S.)

SECRETARIAT, 1998

- Pat Bronkowski
- Gavin Christie
- Marg Dochoda
- Chris Ekonomidis
- Randy Eshenroder
- Marc Gaden
- Chris Goddard
- Ann Krause
- Sean McFadden
- Nicole Shutt
- Barb Staples
- Sharon Thelen
- Robert Young

ANNUAL REPORT AUTHOR/EDITOR

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- Doug Cuddy
- Gary Klar
- Larry Schleen

Awards and Honors

During its annual meeting in Chicago, the Great Lakes Fishery Commission paid tribute to several individuals and groups for their outstanding contributions to the Great Lakes fishery. In particular, the commission honored:

- retiring commissioner Charles Krueger, for his outstanding service on the commission, both as commissioner and as chair;
- the Michigan Sea Lamprey Funding Task Force for its work in communicating the benefits of sea lamprey control;
- retiring Senator John Glenn, for his steadfast commitment to the Great Lakes environment;
- the Rifle River control team, for ushering in a new era of sea lamprey control, where teams from Canada and United States work together on large streams to save time, money, and lampricide;
- Terry Bills for his innovative work in developing granular Bayluscide, a key component of the St. Marys River sea lamprey control effort; and
- Moira Blake, for her longtime service to the program as representative of the lampricide supplier Clariant.



Advisor Chairman Ed Makauskas (left) and Advisor Secretary Dick Reuss (right) present retiring Commissioner Charles Krueger with a certificate recognizing his outstanding service to the commission.



Photos: Great Lakes Fishery Commission

Commissioner David Dempsey (right) thanks members of the Michigan Sea Lamprey Funding Task Force for their efforts to communicate the needs of the program. From L-R, task force members John Schrouder, Kelley Smith, Chuck Pistis, and Paul Wendler accept the award on behalf of the task force.



Commissioner David Balsillie (left) honors the Rifle River sea lamprey control team for innovative and cost-effective sea lamprey control on the river. This summer's treatment of the Rifle was the first time crews from both Canada and the United States worked together on the same stream. (L-R): Alex Gonzalez, FWS; Dorrance Brege, FWS; Denny Lavis, FWS; and Larry Schleen, DFO.



Commissioner David Balsillie (left) recognizes Terry Bills (USGS) for his work in developing granular Bayluscide.



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